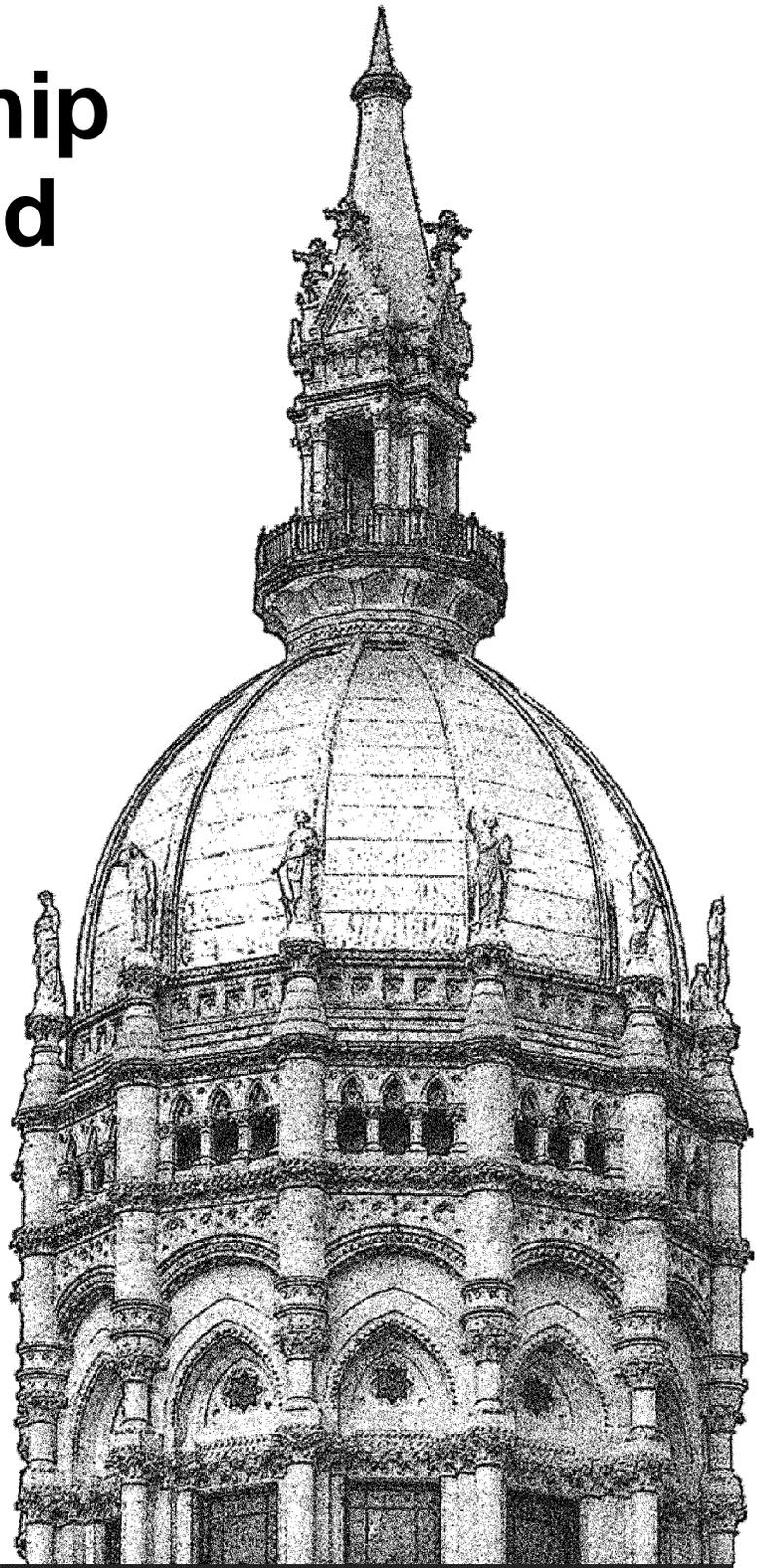


# Apprenticeship Programs and Workforce Needs

December 2015



**PRI**

**Legislative Program Review and  
Investigations Committee**

Connecticut General Assembly

**CONNECTICUT GENERAL ASSEMBLY  
LEGISLATIVE PROGRAM REVIEW AND INVESTIGATIONS COMMITTEE**

The Legislative Program Review and Investigations Committee (PRI) is a bipartisan statutory committee of the Connecticut General Assembly. Established in 1972, its purpose is to “conduct program reviews and investigations to assist the General Assembly in the proper discharge of its duties.” (C.G.S. Sec. 2-53e) From program review topics selected by PRI, the committee examines “state government programs and their administration to ascertain whether such programs are effective, continue to serve their intended purposes, are conducted in an efficient and effective manner, or require modification or elimination.” (C.G.S. Sec. 2-53d) Investigations require broader legislative approval to begin. The committee is authorized to raise and report bills on matters under its review.

The program review committee is composed of 12 members. The president pro tempore of the Senate, the Senate minority leader, the speaker of the house, and the House minority leader each appoint three members. The committee co-chairs and ranking members rotate every two years between House and Senate members from each party.

**2015-2016 Committee Members**

*Senate*

John W. Fonfara, *Co-Chair*

John A. Kissel  
Eric D. Coleman  
Anthony Guglielmo  
Joe Markley  
Andrew Maynard

*House*

Christie M. Carpino, *Co-Chair*

Mary M. Mushinsky  
Whit Betts  
Henry Genga  
Philip Miller  
Cara Pavalock

**Committee Staff**

Carrie E. Vibert, Director  
Miriam P. Kluger, Chief Analyst  
Scott M. Simoneau, Chief Analyst  
Brian R. Beisel, Principal Analyst  
Michelle Castillo, Principal Analyst  
Maryellen Duffy, Principal Analyst  
Eric Michael Gray, Principal Analyst  
Janelle Stevens, Principal Analyst  
Jennifer Proto, Associate Legislative Analyst  
Susan Phillips, Associate Legislative Analyst  
Alexis Warth, Legislative Analyst II  
Olivia Puckett, Administrative Assistant II

**Project Staff**

Maryellen Duffy, Principal Analyst  
Janelle Stevens, Principal Analyst

State Capitol Room 506  
Hartford, CT 06106

(860) 240-0300

[www.cga.ct.gov/pri/index.htm](http://www.cga.ct.gov/pri/index.htm)

[Pri@cga.ct.gov](mailto:Pri@cga.ct.gov)

---

---

LEGISLATIVE PROGRAM REVIEW  
& INVESTIGATIONS COMMITTEE

Apprenticeship Programs and  
Workforce Needs

DECEMBER 2015

---

---



# Table of Contents

---

## Apprenticeship Programs and Workforce Needs

### Study Highlights

### List of Acronyms Used in Report

Executive Summary ..... i

Introduction.....1

**1. Connecticut’s Apprenticeship System.....5**

Apprenticeship Administration .....5

    Federally Required Responsibilities .....5

    Connecticut Activities: Overview.....6

    Working with Apprentices and Sponsors .....7

    Compliance with Federal Law: Monitoring Sponsors .....10

    Data System .....13

    Website .....15

Apprenticeship Promotion .....16

    Enrollment .....17

    Occupations.....17

    Approaches for Completion of Apprenticeships.....22

    Marketing.....24

    Supply of and Demand for Apprentices.....26

**2. At Work: On-the-Job Training .....31**

Registration .....31

Apprentice-to-Journeyman Ratios .....33

Wages.....37

**3. Coursework .....41**

Accessibility.....42

Quality .....44

Academic Credit Availability .....49

**4. Interagency Coordination .....51**

Occupational Training Registered with DCP .....51

Data on Occupational Exam Results and Licensure Status .....52

Enforcement.....53

**5. Alignment Update .....57**

Health Care Occupations .....57

Other Occupations .....	58
Supply Imbalances and College Type.....	60

## APPENDICES

- A. State-Run Apprenticeships
- B. Sponsor Survey
- C. Apprentice Survey
- D. Apprenticeship Systems in Nearby States
- E. Apprenticeships Available in Connecticut
- F. Occupations with Apprenticeships: Connecticut and Nearby States
- G. Connecticut's Hiring Ratio
- H. Nearby States' Apprentice-to-Journeyperson Hiring Ratios
- I. Wage Analysis
- J. Coursework Availability
- K. Licensure Exam Pass Rates by Type of Apprenticeship Coursework Provider
- L. College Credit for Apprenticeship Coursework
- M. Department of Consumer Protection Trainee Occupations
- N. Supply and Demand for Healthcare Practitioners and Related Technical Occupations, Connecticut 2014 Graduates
- O. Supply and Demand for Other Workers, Connecticut 2014 Graduates
- P. Addendum: Post-Study Information on Educator Alignment Data Updating the 2009 PRI Study *Alignment of Postsecondary Education and Employment*
- Q. Study Scope
- R. Agency Response



## Apprenticeship Programs and Workforce Needs

### Background

In July 2015, the program review committee authorized a study of Connecticut's registered apprenticeship system. The study was to examine the scope of the system and how well apprenticeship is promoted. Finally, the project was to include an update of certain information from a 2009 PRI study on workforce supply and demand.

The Connecticut Department of Labor (CT DOL) Office of Apprenticeship Training administers the state's apprenticeship system. The office establishes standards for apprenticeship, oversees apprenticeship participants through a registration process, and promotes apprenticeship. In fiscal year 2015, the office had 10 staff and expenditures of about \$1.05 million. As of June 2015, there were 5,215 apprentices and 1,582 on-the-job training (OJT) organizations participating. The office is advised by the State Apprenticeship Council.

Apprenticeship involves two components: paid OJT and coursework. On-the-job training is overseen by sponsors, who are employers and, for union workers, labor-management partnerships. Coursework is provided by a variety of organizations. Apprenticeship lasts between one and six years. For many licensed occupations, apprenticeship requirements must be finished before the licensure exam can be taken.

To complete this study, program review committee staff: interviewed CT DOL personnel; obtained information from original surveys of and conversations with apprentices, sponsors, coursework providers, and other states' apprenticeship directors; communicated with other state agencies' staff and U.S. Department of Labor apprenticeship personnel; toured a few labor-management partnership training facilities; observed a State Apprenticeship Council Meeting; and analyzed data from multiple state agencies.

### Main Findings

**The apprenticeship office has focused on in-person meetings with new apprentices and sponsors, with little attention to high-level oversight.** In-person, on-site meetings take up substantial office resources and are not done by any of the four nearby states examined in-depth (including states with federally-administered apprenticeship systems). Comprehensive oversight of sponsor quality is required by federal regulation, but is not systematically conducted by the office. The office's data system does not provide data that would assist in program management, and it does not allow for online apprenticeship registration. In addition, the office has not consistently monitored coursework quality. A current review of coursework quality has been riddled with problems.

**The office has promoted apprenticeship, and additional steps could be taken.** The office successfully applied for a major federal grant to assist in promotion, totaling \$5 million over five years, and is partnering with the Manufacturing Innovation Fund to offer qualified manufacturing companies up to \$7.8 million in apprenticeship incentives. Both efforts will expand apprenticeship. Promotion efforts may be hampered by reliance mainly on the completion of a set number of OJT hours, an inadequate website (which is highly inaccurate and incomplete in some cases), and the fact that the Department of Consumer Protection (DCP) administers a "trainee" program similar to apprenticeship for some occupations, among other features.

**An undetermined number of workers are not properly registered as apprentices, which is problematic, perhaps due in part to deficiencies in apprenticeship administration and coordination.** Apprentices who are not registered might not get the benefits of increasing wages (required in apprenticeship) and, for licensed trades, do not get any hours credited toward apprenticeship completion (i.e., licensure eligibility). The annual registration renewal process, which is required, does not involve apprentices until sponsors fail to renew registration. In addition, there does not appear to be strong communication with DCP when either state agency discovers workers are not registered. About 28 percent of apprentices who responded to an original PRI survey reported previously working in a licensed occupation without being a registered apprentice (or licensed).

### PRI Recommendations

**Numerous recommendations are issued to strengthen the apprenticeship office's oversight of sponsors and coursework providers, as well as add to apprenticeship promotion efforts.** Key recommendations would:

1. **Shift office activities to focus on sponsor compliance**, which would be made possible by moving to the free federal data system;
2. **Further apprenticeship promotion** by expanding apprenticeship into different models and overhauling the website;
3. **Stop the coursework provider review underway and replace it** with a new system for setting and monitoring coursework standards; and
4. **Improve coordination with DCP** regarding licensure enforcement and training for licensed occupations.

## Acronyms

---

CSDE	Connecticut State Department of Education
CT DOL	Connecticut Department of Labor
DCP	(Connecticut) Department of Consumer Protection
DECD	(Connecticut) Department of Economic and Community Development
PRI	Program Review and Investigations (Committee)
RAPIDS	Registered Apprenticeship Partners Information Data System, a federal data system accessible for free to all apprenticeship offices, whether state- or federally-run
U.S. DOL	United States Department of Labor

# Executive Summary

---

## Apprenticeship Programs and Workforce Needs

This report is focused on registered apprenticeships, referred to here as simply “apprenticeships.” An apprenticeship involves learning an occupation through on-the-job training, for which the apprentice is paid, and completing coursework. Both aspects of training are overseen by the apprentice’s sponsor, which is the person’s employer or, for a union apprentice, a labor-management partnership. While apprenticeship has traditionally been viewed as the training model for the building trades industry (including occupations like electricians and plumbers), the U.S. Department of Labor (U.S. DOL) has encouraged expansion to other industries, such as advanced manufacturing, health care, and information technology.

To qualify as an apprenticeship, certain national standards must be met. For example, the apprenticeship must be between one and six years long. In addition, the apprentice and the sponsor have to be registered with a designated government apprenticeship office. A state may choose to receive U.S. DOL recognition to run its own apprenticeship system within federal requirements, as Connecticut and 24 other states do (see Appendix A), or to have the U.S. DOL directly in charge of apprenticeships within the state’s borders. Connecticut’s apprenticeship system is run by the Connecticut Department of Labor (CT DOL) Office of Apprenticeship Training.

In Connecticut, as of June 2015, there were 83 occupations that had apprentices, with a total of 5,215 registered apprentices, according to CT DOL documents. On-the-job training was being provided by about 1,563 employers and 19 labor-management partnerships. Coursework was being offered by about 45 providers. Connecticut has more apprentices, on a per capita basis, than nearly all states. A recent think tank study of apprenticeship rates indicated Connecticut joined Alaska, Iowa, Indiana, and West Virginia in having the highest rates, in 2013.<sup>1</sup>

### Study Scope

In July 2015, the Legislative Program Review and Investigations (PRI) Committee authorized this study entitled *Apprenticeship Programs and Workforce Needs* and adopted a study scope. As stated in the scope, the study purpose was to evaluate how well Connecticut is promoting apprenticeships in the state by examining whether the supply of apprentices meets employer demand. The scope also called for an inventory of apprenticeable occupations in Connecticut (including an examination of the different requirements among the occupations), an analysis of how successfully apprentices were completing their apprenticeships, and a comparison of apprenticeship administration in Connecticut to that of nearby states. In addition, a separate component of the study was to update supply and demand information for selected professional occupations originally provided in the 2009 PRI study *Alignment of Postsecondary Education and Employment*.

---

<sup>1</sup> Olinsky, Ben, and Sarah Ayres, *Training for Success: A Policy to Expand Apprenticeships in the United States*, Center for American Progress. Accessed July 22, 2015 at: [https://cdn.americanprogress.org/wp-content/uploads/2013/11/apprenticeship\\_report.pdf](https://cdn.americanprogress.org/wp-content/uploads/2013/11/apprenticeship_report.pdf)

During the course of this study, high staff turnover within the CT DOL apprenticeship office, data system limitations, and other issues that arose led the study focus to expand. Turnover was a particular challenge. The office lost its two management staff in succession due to resignation during the study timeframe and all two clerical staff due to union “bumping.” Given the high staff turnover, PRI staff found it difficult to obtain accurate, consistent, and timely answers to many of its questions, notwithstanding CT DOL’s best efforts. Also, it was challenging to schedule the frequent meetings that usually occur during a study. As a result of these difficulties, and since many of the original study questions could not be answered, the focus of the study changed in part to an evaluation of the Office of Apprenticeship Training to determine if operational improvements should be recommended.

## **Recommendations**

Program review committee recommendations to address multiple CT DOL apprenticeship office deficiencies intend to:

1. shift administrative and program focus toward sponsor compliance with apprenticeship requirements;
2. further apprenticeship promotion;
3. improve coordination between CT DOL and the Connecticut Department of Consumer Protection (DCP), which also has roles in worker training and licensure;
4. remedy on-the-job training issues;
5. review the quality of mandated coursework; and
6. enhance opportunities to earn academic credit for certain apprenticeships.

## **Apprenticeship Administration**

**Quality assurance reviews of sponsors.** Under the National Apprenticeship Act and federal regulation, CT DOL is responsible for developing and implementing apprenticeship processes and policies, within federal requirements. One such requirement is that the state conduct quality assurance reviews of sponsors to make sure federal standards are being followed.

The program review committee found no evidence of quality assurance assessments being systematically conducted by CT DOL staff to ensure compliance with federal rules. Evaluating sponsor compliance to determine whether applicable laws and the written agreement between the apprentice and sponsor are being followed is important. Specifically, compliance monitoring can help ensure the apprentice is receiving appropriate wages, earning credit toward apprenticeship completion for hours worked, and rotating among the various aspects of the work needed in order to completely learn the occupation. Compliance, therefore, can provide a layer of protection to the apprentice. Given the limited staff resources and federal requirements, the PRI committee believes Connecticut DOL apprenticeship staff efforts should shift to monitoring sponsor compliance, similar to how apprenticeship offices operate in most nearby states. This could be achieved by no longer registering apprentices in person, which happens at the sponsor’s location and is not required by state or federal law.

**Database to track sponsors and apprentices.** The data system that CT DOL currently uses to track apprentices and sponsors has several limitations. For example, it is cumbersome to use and does not generate quality management information that would allow the apprenticeship system in Connecticut to be better understood, such as overall completion rates by cohort (i.e., all apprentices who began around the same time). In addition, neither sponsors nor apprentices can access the system at all. The data system is primarily used by CT DOL staff as a case management tool to track individual apprentices and send out registration renewal notices, as well as apprenticeship completion letters.

The PRI committee believes that instead of expending state dollars to create a new system with more data capabilities, Connecticut should use the available federal system. The U.S DOL's apprenticeship office has a web-based data system available free to all states, even those with state-run apprenticeship systems. The federal data system provides for easy data collection, updates, retrieval, and summaries. One key feature is that it allows sponsors to directly apply online to register new apprentices into the system by entering the apprenticeship agreement information, rather than waiting for an apprenticeship office staff person to initiate the process.

**Office of Apprenticeship website.** The apprenticeship office's website should be the go-to place for potential and active apprentices and sponsors to find accurate, complete information that is easily located. The current website falls short of all three standards. An examination of the CT DOL Office of Apprenticeship Training's website shows it lacks some basic information on apprenticeships, sponsors, and coursework providers. Neither does it include comprehensive (yet concise) and easy to find information.

The PRI committee believes that the errors, misinformation, and omissions on the CT DOL apprenticeship's office website need to be corrected. A complete redesign of the site to update the look and make navigation more user-friendly could also benefit apprenticeship promotion efforts.

**Apprenticeship promotion.** The office seems to have actively promoted apprenticeship, particularly in manufacturing. The PRI committee recommends building on promotion efforts by considering expanding apprenticeship to some occupations in which apprenticeships are offered in nearby states, and by offering apprenticeships in some occupations that incorporate competency tests, instead of relying solely on time put in.

## **At Work: On-the-Job Training**

**Apprentice registration.** To qualify as an apprentice, an individual must be registered with CT DOL. To maintain the apprenticeship, a sponsor and apprentice must both pay a registration renewal fee and submit a renewal form every year by June 30.

Multiple problems were found with the renewal reminder and de-registration process. An apprentice is not directly contacted until his or her renewal fee is more than a month overdue, and even then, the individual receives only one notice before being de-registered. The state labor department reported that about 10 percent of apprentice notices never reach the intended apprentices. In addition, the renewal process is resource-intensive, relying on hard-copy reminders and phone calls.

These features of the renewal process could be contributing to a significant problem. Throughout the study, the program review committee and its staff repeatedly heard that entry-level employees in licensed occupations were working for months and sometimes years without being registered apprentices, when legally they should have been. In some cases, people alleged that their companies had said the registration had been completed, or had been renewed. People who are working in a licensed trade at entry-level but are not registered apprentices, or whose registration has lapsed, cannot (under current practices) receive any credit toward apprenticeship completion for the on-the-job training hours or skills gained.

The PRI committee believes that a higher level of apprentice involvement in the renewal process, multiple reminders sent before and after the renewal data, and incorporating e-mail could help ensure apprentices remain registered and get credit for on-the-job training.

**Apprentice-to-journeyperson ratios.** Many states, including Connecticut, have adopted a schedule of the maximum number of apprentices allowed at a company or on a job site, based on how many journeypersons (i.e., experienced workers) there are. Connecticut's company-based ratio, called the hiring ratio, is contentious, as it is elsewhere. A company may request an exception to that ratio, called ratio relief, from CT DOL. From 2010 through 2014, 72 percent of these requests were successful. However, the agency decision process and criteria seemed unclear to multiple company representatives. Therefore, the PRI committee recommends greater transparency in these areas and in the results of the ratio relief exception requests.

**Wages.** Apprentice entry and completion wages are determined by the sponsor, within the parameters set by CT DOL as well as state and federal laws. Wages for apprentices and journeypersons in six occupations were compared to four "livability" standards. In general, wages are livable for single adults, but perhaps not for an adult supporting a four-person family.

## **Coursework**

Each apprentice must successfully complete coursework in order to finish an apprenticeship. The number of minimum coursework hours varies among the trades, with about 144 hours for every year of on-the-job training. The Connecticut labor department reviews and approves educational institutions and other types of organizations as offering sufficient coursework for apprenticeships.

**Quality.** The quality of apprenticeship coursework has not been reviewed routinely, if at all, based on PRI study inquiries. In early 2015, though, the CT DOL apprenticeship office and the Connecticut State Department of Education (CSDE) launched an examination of some approved providers' coursework. The evaluation seems to be focused on private occupational schools and industry-related schools, and it was limited to the coursework for four major licensure categories. Essentially the evaluation has involved comparing the schools' curricula to the Connecticut Technical High School System's evening apprenticeship coursework.

As of early December 2015, most of the reviewed private occupational schools and all but one industry-related provider have been found deficient (i.e., approval still pending) for at least one occupation's program. The providers have been notified that if their courses are not adjusted by January 1, 2016, approval is withdrawn, according to CT DOL.

The review process has been rife with problems, from the view of the coursework providers under examination and the PRI committee. Multiple approved providers have stated that the process is deeply flawed because, in their view:

1. The review standards are inappropriate to the trade or out-of-date, or they do not match the current licensing exam questions, in at least a few cases;
2. The documents used for the evaluation (the crosswalks) are so detailed that they are meaningless and have required tremendous effort by coursework providers to complete;
3. The process and what needed to be shared have not been clearly explained, a problem worsened by a lack of availability of appropriate CT DOL personnel; and
4. Programs have been deemed deficient despite strong or comparable licensure exam pass rates, which could be considered a measure of whether the coursework is sufficient.

These complaints have come from providers in both the industry-related and private occupational school categories. All of the providers that approached program review committee staff noted that they used curriculum approved and routinely updated (e.g., every three years) by general or occupation-specific building industry associations at the national level.

Furthermore, the PRI committee is concerned that if formerly approved providers are unable to adjust curricula in time, as seems likely, the still-approved coursework options will be extremely limited. If coursework accessibility is severely constrained, a large number of apprentices will be unable to complete their apprenticeships (and therefore, move up to better-paying positions) in a timely way. That could negatively impact both apprentices and sponsors (i.e., employers and labor-management partnerships).

Therefore, the PRI committee recommends stopping the review and replacing it with a new process. The new process would involve the occupational licensing boards, the State Apprenticeship Council, and approved providers, as well as the public. It would result in standards that would be applied consistently and routinely, and periodically updated.

**Academic credit.** College-level academic credit can be made available to apprentices who successfully complete apprenticeship coursework requirements at a coursework provider that has been assessed by a college or accrediting organization for equivalency. Some coursework providers offer credit, while others do not (e.g., at least eight of 19 labor-management partnerships do not). Academic credit could be useful to people looking to transition out of their careers or move up into management. However, credit evaluations do cost money and the use of credit might in fact be limited. Therefore, the PRI committee recommends CT DOL, the Department of Consumer Protection, and Charter Oak State College (which has done many coursework evaluations) discuss what resources would be necessary to undertake licensure-based credit evaluations. These evaluations could benefit more workers than evaluations of individual coursework providers.

## **Interagency Coordination**

The Departments of Labor and Consumer Protection are both involved in preparing and credentialing the workforce for certain occupations, as well as in ensuring employers follow labor-related laws. Although the departments communicate frequently on an as-needed basis, there are a few areas in which coordination could be strengthened or clarified.

**Occupational training.** The Department of Consumer Protection (DCP), with the assistance of occupational boards, oversees worker training for 20 licensed occupations that do not have apprenticeships but require similar coursework and on-the-job training. Called “trainee occupations,” they generally are highly specific. Someone who wishes to learn a trainee occupation must request DCP registration via a form available on the DCP website; unregistered (non-licensed) working in the occupation is not allowed. Unlike with apprenticeships, there is no employer or sponsor approval process. As of August 2015, there were 215 DCP trainees.

The DCP training system arose over the last 20 years or so. As the legislature created more licensure types, including several “limited” licenses, no sponsors requested that CT DOL create corresponding apprentice programs. Because state law requires workers in licensed trade-type occupations be licensed or registered with a state agency, wherever a licensed occupation did not have apprenticeships, DCP stepped in with the trainee program.

Most of the DCP training occupations seem to meet the requirements for apprenticeable occupations. Twelve of the 18 occupations with set training lengths require at least one year of on-the-job experience and they appear to meet the other criteria as well (e.g., involve the acquisition of manual or technical skills and knowledge).

The current bifurcated system for training people in licensed occupations has multiple problems. First, there is some confusion among potential trainees/apprentices, and possibly employers, about which agency handles training. Second, employers are held to different standards depending on whether they are part of CT DOL apprenticeship or DCP trainee programs, which could be considered unfair. Third, DCP trainee registration forms and requirements are not easily accessible on the DCP website, unlike CT DOL apprenticeship information for some occupations.

Because CT DOL is the primary department overseeing workforce development activities in the state, the PRI committee recommends that CT DOL should oversee all apprenticeships meeting the minimum on-the-job training and coursework requirements, as well as handle all trainee registration for licensed occupations that do not meet the requirements. If CT DOL declines taking over trainee registration, DCP should improve the web accessibility of the trainee information.

**Enforcement.** The Department of Consumer Protection Trade Practices Division investigates and takes enforcement action against employers who do not follow employee occupational licensure requirements. For licensed trades with apprenticeships or trainee programs, an employee must be either licensed or a registered apprentice (or trainee) who is being directly supervised, at a minimum, by at least one journeyman. According to the

department, when these requirements are violated and detected, DCP fines the employer, not the individual working for the company.

During the committee's October informational public hearing for the study, testimony was provided on two types of situations where companies employ workers who should be registered as apprentices but are not:

1. An employer is a CT DOL approved sponsor with one or more registered apprentices, and then fails to either register additional entry-level workers as apprentices or to annually renew apprentice registrations; and
2. An employer was never a CT DOL approved sponsor, and hires entry-level workers who have never been registered as apprentices with CT DOL.

The use of unlicensed workers who should be registered as apprentices but are not, raises safety concerns because the employer is not necessarily training or supervising the entry-level person appropriately. Furthermore, these workers often earn lower wages than they would as apprentices, and they do not receive any hourly credit because they were not registered.

Some of the organizations and individuals providing testimony at the October public hearing suggested the function of occupational licensure enforcement with respect to apprentices be transferred from DCP to CT DOL. The rationale is that CT DOL also performs worksite enforcement activities related to laws on minimum wage, overtime, wage payment, prevailing wage, and employment of minors.

Although PRI acknowledges there may be some overlap in enforcement activities between the two agencies, the committee is not recommending this function be transferred. The functions of each agency and applicable laws would need a more thorough review before such a recommendation could be made. Furthermore, both agencies' resistance to the idea of transfer was strong, which casts doubt on whether transfer would be carried out effectively.

The program review committee does believe, though, that DCP and CT DOL should be aware of actions taken against employers by either department and therefore, recommends better coordination between these two agencies regarding unlicensed and unregistered workers.

### **Alignment Data Update: 2009 PRI Study<sup>2</sup>**

Most occupations examined (18 of 25) seemed to have an over-supply of graduates in 2014, based on Connecticut-specific job opening and graduate data.

---

<sup>2</sup> Legislative Program Review and Investigations Committee, *Alignment of Postsecondary Education and Employment* (Hartford, Conn.: 2009).

## List of Committee Recommendations

### Apprenticeship Administration

- 1. The Connecticut Department of Labor’s apprenticeship office should discontinue in-person registration for new apprentices and dedicate substantial staff time to sponsor monitoring.**
  - a) Upon apprentice registration, materials should be mailed to each new apprentice that include the “Apprentice Handbook & Progress Report” along with an easy-to-understand one-page explanation of apprentice and sponsor responsibilities. If an apprentice switches sponsors, just the one-page explanation should be mailed to the apprentice, reminding him or her of each party’s responsibilities.**
  - b) The state labor department should establish a rotating schedule, along with a plan, to monitor sponsor compliance with federal and state laws and regulations. In addition to the annual review required for new sponsors by the federal government, each sponsor should be reviewed every five years per federal regulation.**
  - c) Either the U.S. Department of Labor apprenticeship office’s quality assurance form or a common form developed by the Connecticut labor department should be used for each sponsor. Data from the form should be collected and aggregated so the department can track problem areas across sponsors. During an on-site compliance review, the Connecticut labor department should check on the Apprentice Handbooks of those apprentices who are on premises to make sure the handbooks’ logs of on-the-job training hours are being kept up-to-date and signed, apprentices are being rotated in different work tasks, and coursework progress is being made. Connecticut labor department staff should also check on recent apprentice wages to ensure the wage progression schedule is being followed.**
  - d) Every sponsor identified by a review as seriously out of compliance (as defined by the department) shall be subject to random visits by field staff to ensure the sponsor has implemented any recommendation that was determined to be needed at the time of the review.**
  - e) Beyond routine monitoring, Connecticut labor department staff should focus on those sponsors that continually fail to register new apprentices within the federally required 45 days of hiring. A special effort should be made to contact apprentices who are employed by those sponsors to remind them of the consequences of no registration (i.e., no credit earned towards hours needed for completion of apprenticeship).**

f) **The results of any compliance review conducted by the Connecticut labor department should be accessible and linked to the sponsor list that is maintained online. (pp. 12–13)**

**2. The Connecticut Department of Labor should transition to the U.S. Department of Labor apprenticeship data system. The Connecticut labor department should discuss with the federal labor department the details of transferring to the federal data system RAPIDS 2.0 in summer 2016, including timeframes for the transfer, the data to be transferred, and staff training. (p. 15)**

**3. The Connecticut Department of Labor should revamp its apprenticeship website with clear and comprehensive information for potential and current apprentices, sponsors, and coursework providers. The website should be regularly updated and include links to appropriate sources of information, such as all approved coursework providers' websites. (p. 16)**

### **Apprenticeship Promotion**

**4. The Connecticut Department of Labor should consider contacting potential sponsors involved in occupations that have apprentices in nearby states but not in Connecticut, to learn whether there is interest in launching those apprenticeships here. Even if sponsors are interested, when determining whether an occupation might be appropriate for apprenticeship in Connecticut, the apprenticeship office should take into consideration existing training options and wages, and how apprenticeship might alter those. (p. 22)**

**5. The Connecticut Department of Labor should offer sponsors at least two of the three models of apprenticeship in the ten licensed and ten unlicensed occupations with the most apprentices by July 1, 2018.**

a) **For each occupation, the apprenticeship office should convene industry groups including at least six sponsors (three each from union-contracting companies and other companies) and, for licensed occupations, members of the relevant licensing board, to recommend sample apprenticeship on-the-job training requirements for each of (at least) two of the three possible models (time-based, competency-based, and hybrid). The State Apprenticeship Council should review the industry groups' samples and the apprenticeship office should approve them, or approve with revisions.**

b) **The Connecticut labor department and the Department of Consumer Protection should review statutes and regulations to determine whether any revisions are necessary to comply with federal regulation allowing all three types of models. If so, the department(s) should pursue the necessary changes. (p. 23)**

## **At Work: On-the-Job Training**

**6. The Connecticut Department of Labor should change the apprenticeship registration renewal process in the following ways:**

- a) Apprentices and sponsors should both be reminded multiple times before and after the renewal fee due date.**
- b) The office should use its computer system to e-mail pre-due date reminders to those apprentices and sponsors with e-mail addresses on file.**
- c) After the fee due date, the office should call both apprentices and sponsors before a deregistration notice is sent by mail and e-mail.**
- d) The renewal form from the apprentice should be revised to include:**
  - the apprentice's on-the-job training hours earned, in total, at the point of submission;**
  - a note on the apprentice's progress or status regarding coursework; and**
  - dated signatures from both the apprentice and a sponsor representative attesting to the information's accuracy.**

**In addition, the apprentice renewal form should instruct the apprentice to make a copy of the form and keep it until the apprentice has fulfilled all requirements of apprenticeship and, if applicable, become licensed. (p. 33)**

**7. The Connecticut Department of Labor should amend its regulations to include the process to be used by sponsors to request apprentice-to-journeyperson ratio relief. The department also should post, on its website, a list identifying the sponsors that have received ratio relief, along with the number of apprentices and journeypersons the sponsor was allowed. (pp. 36-37)**

## **Coursework**

**8. The Connecticut Department of Labor should immediately suspend its evaluation of apprenticeship coursework providers and notify them of the suspension. The department should then take the following steps to develop and implement apprenticeship coursework standards:**

- a) Give administrative and technical assistance to the licensing boards, each of which should propose coursework standards for every license under its jurisdiction by July 1, 2017. The coursework standards should reflect current practices and knowledge needed for each occupation, including knowledge tested on occupational licensing exams. As part of the standards proposal, the licensing board also should determine whether**

- any curriculum developed by a national industry association or a national accrediting body is acceptable in lieu of the coursework standards. In formulating each proposal, the licensing boards should seek comments and suggestions from all coursework providers who had been previously approved by the labor department as apprenticeship coursework providers.
- b) Deliver the licensing board proposals to the State Apprenticeship Council for the council's review and suggested revisions, by August 1, 2017. The council should examine the proposals, receive public comment on them, and give suggested revisions to the labor department by December 1, 2017.
  - c) Determine the coursework standards and publish them on the labor department's website by December 31, 2017.
  - d) Use the new standards to evaluate organizations that apply to become new coursework providers, or approved coursework providers that apply for approval to offer coursework in an occupation for which approval was not originally granted.
  - e) Set a schedule and clear process for reviewing approved coursework provider quality on a routine basis, by December 31, 2017.
  - f) Set a schedule for regularly updating the coursework standards at least every five years. The update process should be the same as the process outlined above for developing the standards. (p. 48)

9. The Connecticut Department of Labor, Charter Oak State College, the Department of Consumer Protection, and the licensing boards should discuss what resources would be needed to undergo an assessment that could result in making academic credit available to license holders in apprentice occupations. The groups should then consider whether to move forward with assessment(s). (p. 50)

#### **Interagency Coordination: Departments of Labor and Consumer Protection**

10. The Connecticut Department of Labor should offer apprenticeships in all licensed trainee occupations that meet the minimum on-the-job training and coursework requirements for apprenticeships, by July 1, 2017. The department should conduct outreach to encourage employers to become sponsors in those occupations.

The labor department should consider handling all trainee registration and related matters for licensed occupations that require training but do not meet the requirements of registered apprenticeship. The department should consider a standalone, minimally-staffed trainee office that coordinates closely with the apprenticeship office. (p. 52)

**11. The Department of Consumer Protection should revise its website so that each trainee occupation or trainee occupational field's webpage links to the trainee registration application and to clear standards for the specific trainee program. (p. 52)**

**12. Every few years, the Connecticut Department of Labor should examine occupational exam results by apprenticeship coursework provider and licensure data by occupation and sponsor. The resulting information should be used to assist coursework providers and sponsors in improving the quality of apprentice training. (p. 53)**

**13. The Connecticut Department of Labor should clarify how long sponsors have to register a new employee as an apprentice and should consider the 45-day window that is allowed under federal regulation. (p. 54)**

**14. The Connecticut Department of Labor and the Department of Consumer Protection should take the following steps regarding occupational licensure enforcement:**

- a) Any enforcement action taken by the Department of Consumer Protection against an employer involving the use of employees performing work that requires apprentice registration or occupational licensure should be forwarded to the Connecticut Department of Labor apprenticeship office on a monthly basis.**
- b) The apprenticeship office should check its data system to determine if the worker was ever registered as an apprentice and/or if the employer was ever an approved sponsor. If so, the office should contact the sponsor to determine the reason(s) the sponsor did not register the employee as an apprentice. If the worker was ever registered as an apprentice, the apprentice should be mailed a reminder notice that he or she is not considered a registered apprentice and therefore will not receive credit towards apprenticeship completion until registered.**
- c) In addition, the state labor department, Wage and Workplace Standards Division should send a monthly report to DCP and the apprenticeship office delineating any violations that division has identified and found valid for those transgressions that involve workers without proper credentials. (p. 55)**

# Introduction

---

This study is focused on registered apprenticeships, referred to as simply “apprenticeships” throughout this report. An apprenticeship involves learning an occupation through paid on-the-job training and coursework. Both aspects of training are overseen by the apprentice’s sponsor, which is the person’s employer or, for a union apprentice, a labor-management partnership. While apprenticeship has traditionally been viewed as the training model for the building trades industry (including occupations like electricians and plumbers), the U.S. Department of Labor (U.S. DOL) has encouraged expansion to other industries, such as advanced manufacturing, health care, and information technology.

To qualify as an apprenticeship, certain national standards must be met (listed in Figure 1). In addition, the apprentice and sponsor have to be registered with a designated government apprenticeship office.

**Figure 1: National Registered Apprenticeship Standards**

- 1. Agreement:** A written apprenticeship agreement, listing program standards, is signed by the employer and the apprentice.
- 2. Wages:** Apprentices are full-time and earn wages from employers right from the beginning of training. Wages increase on a schedule as the apprentice gains experience.
- 3. On-the-job learning:** Between 2,000 and 12,000 structured hours (i.e., one to six years of full-time work), under the direction of at least one of the employer’s workers, are required.
- 4. Coursework:** A minimum of 144 additional hours of classroom instruction each year is recommended.
- 5. Credential:** By completion, the apprentice has gained an industry-recognized credential.

Source: PRI staff analysis of U.S. DOL Code of Federal Regulations, Title 29, Part 29.5.

In 1937, the Fitzgerald Act, officially known as the National Apprenticeship Act, authorized and established the national registered apprenticeship system. The legislation intended to build the workforce and protect entry-level workers in apprenticeable trades. It gives the U.S. Secretary of Labor authority over apprenticeship programs, establishes an office of apprenticeship within the U.S. DOL, and allows state governments to register and administer apprenticeship programs within the federal requirements.

A state may choose to receive U.S. DOL recognition to run its own apprenticeship system within federal requirements, as Connecticut and 24 other states do (see Appendix A). Alternatively, a state can opt to have U.S. DOL directly in charge of apprenticeships within the state's borders. The federal labor department completely funds apprentice system administration that it operates for other states.

## **Administration in Connecticut**

This state's apprenticeship administration is handled by the Connecticut Department of Labor (CT DOL) Office of Apprenticeship Training (referred to as "the apprenticeship office" throughout this report). The office is advised by a 12-member gubernatorially-appointed State Apprenticeship Council.<sup>1</sup> In state fiscal year (FY) 15, the apprenticeship office was staffed by 10 people and spent \$1,051,408.<sup>2</sup> It is responsible for:

- setting apprenticeship requirements consistent with the federal standards;
- registering sponsors and apprentices;
- approving educational institutions and others that provide apprentices with mandatory coursework; and
- monitoring worksites to ensure compliance with federal and state requirements.

The Department of Consumer Protection (DCP) also has important related roles. It sets standards and administers licensure exams for individuals who have completed an apprenticeship or other required training and need a license to work in certain occupations. The department also investigates and takes enforcement action against employers who do not follow occupational licensure requirements.

## **Benefits**

Apprenticeship is widely agreed to benefit both apprentices and sponsors. A registered apprenticeship provides the apprentice with an income while helping the apprentice gain occupational and other job-related skills in a real work setting, so apprenticeship is sometimes called an "earn and learn" model. There is evidence that apprenticeship completion raises wages.<sup>3</sup> For licensed occupations, apprenticeship completion may be a mandatory prerequisite to qualify for a licensing exam; for unlicensed occupations, apprenticeship could improve one's marketability. Employers participate in apprenticeship because it helps them grow their own workforce, contributes to maintaining a supply of well-trained employees, and is more affordable than hiring experienced or licensed workers. Apprenticeship participation might also yield state tax credits or other financial benefits.

---

<sup>1</sup> As of October 2015, there was one vacancy.

<sup>2</sup> For FY 15, expenditures were: General Fund expenditures of \$544,379; expenditures of \$381,670 from one-half of the total sponsor and apprentice registration fees received (the other half is deposited in the General Fund); and federal grant expenditures of \$125,360.

<sup>3</sup> Reed, Debbie, Albert Yung-Hsu Liu, Rebecca Kleinman, Annalissa Matri, Davin Reed, Samina Sattar, and Jessica Ziegler, *An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States*, Mathematica Policy Research. Accessed July 22, 2015 at: [http://wdr.doleta.gov/research/FullText\\_Documents/ETAOP\\_2012\\_10.pdf](http://wdr.doleta.gov/research/FullText_Documents/ETAOP_2012_10.pdf)

## Study Scope

The committee authorized this study entitled *Apprenticeship Programs and Workforce Needs* and approved a scope of study in July 2015 (see Appendix Q). As stated in the scope, the purpose of the study was to evaluate how well Connecticut is promoting apprenticeships in the state by examining whether the supply of apprentices meets sponsor demand. The scope also called for: an inventory of apprenticeable occupations in Connecticut, including an examination of the different requirements among the occupations; an analysis of how successfully apprentices were completing their apprenticeships; and a comparison of apprenticeship administration in Connecticut to that of nearby states. In addition, a separate component of the study updates supply and demand information for selected professional occupations that was provided in the 2009 PRI study called *Alignment of Postsecondary Education and Employment* (2009 PRI alignment study).

During the course of this study, high staff turnover within the CT DOL apprenticeship office, data system limitations, and other issues that arose led the study focus to expand. Turnover was a particular challenge. The office lost its two management staff in succession due to resignation and all two clerical staff due to union “bumping” while the study was in progress. Given the high staff turnover, PRI staff found it difficult to obtain accurate, consistent, and timely answers to many of its questions. Also, it was challenging to schedule the frequent meetings that usually occur during a study. As a result of these difficulties, and since many of the original study questions could not be answered by the office, the focus of the study changed in part to an evaluation of the Office of Apprenticeship Training to determine if operational improvements should be recommended.

## Study Methodology

A variety of sources and methods was used to conduct this study’s research, including:

- a review of relevant literature on the topic;
- interviews with:
  - staff from the Connecticut State Department of Education (CSDE); and the Departments of Labor Consumer Protection (DCP), and Economic and Community Development (DECD);
  - staff from the Board of Regents for Higher Education;
  - staff from the U.S. DOL, Region 1, who also demonstrated how the U.S. DOL’s apprenticeship data system works;
  - apprenticeship coursework providers;
  - sponsors, including labor-management partnerships (with tours of two such training facilities) and employers;
  - business, industry, and worker representatives; and
  - community organizations;
- observation of a State Apprenticeship Council meeting;
- observation of CT DOL staff meetings with sponsors and new apprentices;

- four PRI staff-developed surveys sent to:
  - sponsors;
  - apprenticeship coursework providers;
  - apprentices; and
  - directors of other northeastern apprenticeship offices (including both state-administered and those operated directly by U.S. DOL), with telephone follow-up;
- analysis of:
  - an Access database maintained by CT DOL to track sponsors and apprentices, and other information provided by CT DOL;
  - licensure exam pass rates for each apprenticeship coursework provider’s graduates as well as other information provided by DCP;
  - apprenticeship and journey person (i.e., experienced worker) wage data compared to multiple wage “livability” standards; and
  - supply and demand data for selected occupations, primarily from CT DOL and the Office of Higher Education, to update the 2009 PRI alignment study.

## **Report Organization**

This report is organized into five chapters. The first chapter examines apprenticeship administration and promotion in Connecticut and issues recommendations for improvement. The second chapter describes on-the-job training issues identified by sponsors and apprentices during the course of this review and recommends potential remedies. The third chapter explains the requirements for coursework, identifies providers who offer coursework, and critiques a recent process by CT DOL to review selected providers’ curriculum content, recommending the process be replaced. The fourth chapter describes selected Department of Consumer Protection activities and recommends better coordination between CT DOL and DCP for areas that involve licensed occupations. The fifth chapter provides an update of the 2009 PRI alignment study report’s data on supply and demand for selected occupations.

There are also 18 appendices, three of which contain information from survey responses received by PRI. They are provided in Appendices B (sponsor survey), C (apprentice survey), and D (survey of directors of selected northeastern apprenticeship offices).

## **Agency Response**

It is the policy of the PRI committee to provide agencies studied by the committee with an opportunity to review and comment on committee findings and recommendations prior to publication of the final report. Written responses were solicited from the state Department of Labor and the Department of Consumer Protection. The labor department’s formal comments are provided in Appendix R.

---

## Connecticut's Apprenticeship System

### Apprenticeship Administration

Connecticut operates its own apprenticeship training system through the state labor department's Office of Apprenticeship Training. About half of all states similarly run their own systems; the others' systems are directly administered by the U.S. Department of Labor (U.S. DOL) Office of Apprenticeship, Training, Employer, and Labor Services. That federal apprenticeship office also oversees state-run apprenticeship systems, to ensure compliance with federal laws and regulations.

As noted in the Introduction, during this study, Connecticut's apprenticeship office experienced high staff turnover. Its two managerial staff resigned, and all two clerical staff were "bumped" due to repercussions from the loss of some U.S. DOL funds (from rising employment). The office was in the process of recruiting a new director as of October 2015.

The office's tremendous turnover, its administration and data system deficiencies, and the study's short timeframe made this project's research challenging. Program review committee staff:

- encountered delays in setting up meetings and obtaining requested information, including getting access to the office's main database for tracking apprentices and their sponsors;
- received inconsistent and in some cases inaccurate responses to committee staff questions; and
- did not receive clear information on basic issues, such as the coursework provider review process (described in Chapter 3) or the occupations in which apprenticeship is offered.

As best as PRI could determine, the Connecticut apprenticeship office's activities seem to revolve around historical work activities (e.g., in-person apprentice registration at the sponsor's location), responding to external forces such as Requests for Proposals from the federal government and other state entities' actions, and attempting to conform to U.S. DOL requirements on program operations. This chapter identifies some administrative challenges and makes recommendations, including that the apprenticeship office shift activities away from in-person apprentice registration and toward sponsor monitoring. The shift is intended to ensure apprentices are obtaining the experience and hours needed for completion, and the pay to which they are entitled.

### Federally Required Responsibilities

The Connecticut apprenticeship office is responsible for setting program standards consistent with the federal standards, registering sponsors and apprentices, and monitoring compliance. The office is advised by the State Apprenticeship Council, which has 12

gubernatorially-appointed members, including the CT DOL commissioner who is the council chair.<sup>1</sup> The council is not required to meet regularly, only upon the chair's call.

Under the National Apprenticeship Act and federal regulation, CT DOL is responsible for developing and implementing apprenticeship processes and policies, within federal requirements. These processes and policies include: the apprentice registration process; the items that should be addressed in the apprenticeship agreement between sponsors and apprentices; the records that sponsors must keep; the approval process for new sponsors; and the process for monitoring sponsors. The apprenticeship office must specifically ensure that each apprenticeship involves:

- a list of tasks in which the apprentice will receive training and on-the-job experience (called a “work process schedule”);
- organized instruction designed to provide an apprentice with technical knowledge related to the occupation (called “coursework” or “related instruction”), with a recommended minimum of 144 hours per year of the apprenticeship;
- a progressively increasing schedule of apprentice wages;
- proper on-the-job supervision and adequate training facilities;
- periodic evaluation of apprentice progress in job performance and coursework; and
- no discrimination in any phase of selection, employment, or training.

The CT DOL apprenticeship office must allow itself to be monitored by the U.S. DOL's apprenticeship office, which is charged with ensuring the state-run apprenticeship systems meet federal requirements.<sup>2</sup> There are two main ways by which the CT DOL apprenticeship office is monitored: the quarterly reports it submits to the federal office, which provide basic information (e.g., the number of apprentices); and on-site reviews by the federal office. The CT DOL apprenticeship office regularly submits the quarterly reports, but its last on-site review was in 2005.

### **Connecticut Activities: Overview**

The major activities of the office during recent years have been:

- registering sponsors (i.e., employers and labor-management partnerships) and apprentices, following up on sponsors and apprentices with overdue registration renewal fees and forms (see Chapter 2), issuing completion

---

<sup>1</sup> There was one vacancy as of October 2015.

<sup>2</sup> All apprenticeship systems are governed by federal regulations (29 Code of Federal Regulations (CFR) Part 29 and 20 CFR Part 30).

letters to apprentices when appropriate, and handling questions from apprentices and sponsors;

- applying for and winning a federal grant to boost the numbers of apprentices and sponsors, which builds on a recent state funding initiative specific to manufacturing; and
- promoting apprenticeship in-person.

## **Working with Apprentices and Sponsors**

**Apprentice registration and completion.** In order to become an apprentice, one must be at least 16 years old and available to work full-time. No prior experience or knowledge in the trade is necessary.

An individual who is at least 16 and attends high school may become a pre-apprentice. A pre-apprentice goes through the registration process described below, and then accumulates on-the-job and coursework hours that “count” once the person graduates high school (or drops out) and becomes a full apprentice. State labor department staff estimate there are now between 150 and 200 pre-apprentices, most of whom are state technical high school students.

It is the responsibility of the individual seeking to become an apprentice (or pre-apprentice) to find a sponsor (an employer or labor-management partnership) that will abide by the rules and standards set out both federally and by the state. The Connecticut labor department maintains lists of sponsors it has approved (both recently and in the past) on its website but it is up to the individual to locate an existing or new sponsor and get hired. Once the individual and sponsor have established a working relationship, and the sponsor has received CT DOL approval if not previously obtained, the state labor department becomes involved.<sup>3</sup>

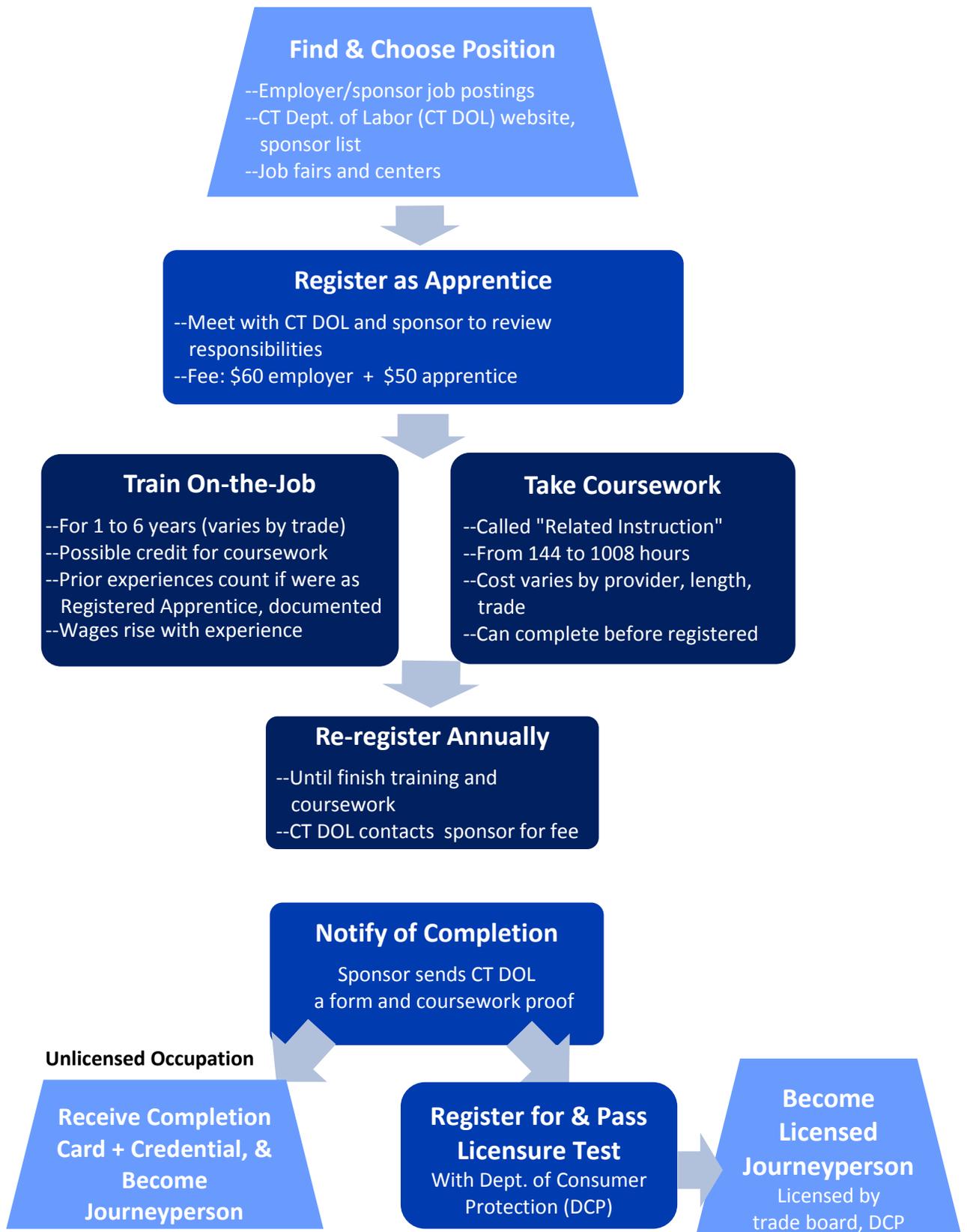
Figure 1-1 illustrates the steps that must be taken to become an apprentice in Connecticut. An apprentice may register in person during an informational meeting with the sponsor and CT DOL, usually at the sponsor’s location, or be registered when the sponsor submits the registration form to CT DOL, with the informational meeting occurring at a later date. The registration form (i.e., apprenticeship agreement) spells out responsibilities and terms, including the wage progression schedule, the trade category in which the person will apprentice, and any credit for previous experience.

Upon registration, each apprentice receives a handbook, published by CT DOL and the apprenticeship council. The handbook enumerates the responsibilities of all three parties. It also includes a form on which the apprentice must record on-the-job training hours and each month obtain his or her supervisor’s sign off on progress in on-the-job training. The apprentice must also identify the coursework provider in the handbook.

---

<sup>3</sup> If a previously-approved company has had no apprentices in the last five years, re-approval by CT DOL is required before a new apprentice may be sponsored.

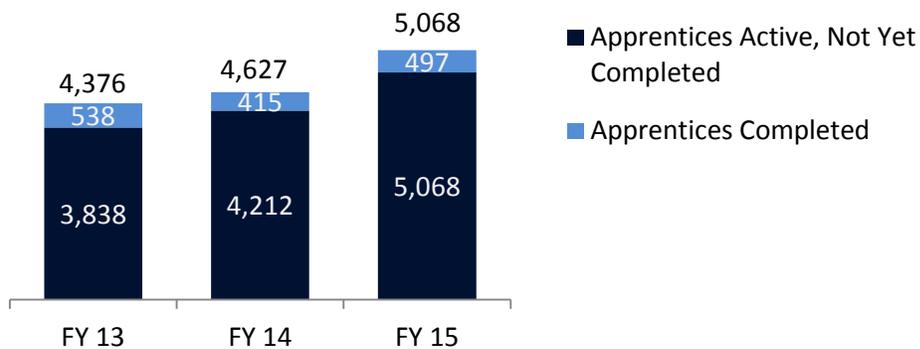
**Figure 1-1: How to Begin and Complete an Apprenticeship**



Source: PRI staff

In Connecticut, as of June 2015, there were 83 occupations that had apprentices, with a total of 5,215 registered apprentices, according to CT DOL documents. On-the-job training was being provided by about 1,563 employers and 19 labor-management partnerships. Coursework was being offered by about 45 providers. Figure 1-2 shows the number of active (i.e., not yet completed) apprentices over the last three fiscal years (FYs), as well as the number of individuals completing apprenticeships. Connecticut DOL staff report that the numbers of apprentices in this state and nationally are highly dependent on the economy. Since FY 13, the number of active apprentices in Connecticut has increased by 16 percent as the economy has improved; however, the number of annual apprenticeship completers has fluctuated and overall is down slightly from FY 13.

**Figure 1-2: Number of Participating and Completing Connecticut Apprentices, FYs 13-15**



Source: PRI staff analysis of CT DOL data.

Program review committee staff calculated completion rates for apprentices who completed in FY 14 in occupations that require a minimum of four years of apprenticeship. Only the top four occupations (in terms on apprentice numbers) were examined: electrician (E-2), plumbing and mechanic (P-2), carpenter, and heating and cooling mechanic (S-2). The data show the median length of time for those apprentices who completed ranged from 68 to 79 months, depending on the occupation. This type of data would be useful for the apprenticeship office so that its staff could examine why apprentices in certain trades complete on time, compared to those who do not. Then, the office could potentially develop strategies for helping apprentices finish apprenticeship requirements as quickly as possible.

**Customer service.** Connecticut apprenticeship office staff travel to employers and labor-management partnerships (i.e., sponsors) to explain apprenticeship responsibilities jointly to new apprentices and their sponsors. The apprenticeship office staff also are available to answer questions from apprentices and sponsors, as well as those interested in apprenticeship but not yet participating. The office does not keep any data regarding how many questions are received or answered, or how quickly responses were provided. Neither does the office regularly survey apprentices or sponsors to determine satisfaction with the office’s customer service.

For this study, program review committee staff attempted to determine customer satisfaction by surveying roughly half of all active apprentices (by mail) and all sponsors with an e-mail address contact filed with the Connecticut apprenticeship office (by e-mail), equaling about one-third of all current and past sponsors. Of the 2,611 surveys sent to apprentices, 250 responses were received; 1,754 sponsor surveys were sent, with 257 received. Although the response rate was not strong for either survey (roughly 10 and 15 percent, respectively), key findings related to the registration process were:

- About 30 percent of responding sponsors were not satisfied with how quickly the office registered new apprentices;
- About 35 percent of responding apprentices indicated they had not met with an apprenticeship office staff person and the sponsor (jointly) to review the apprenticeship agreement (as part of or after the registration process); and
- Of those responding apprentices who recalled meeting with an apprenticeship office staff person, the vast majority (94 percent) were satisfied with how well the staff person explained apprentice and sponsor responsibilities.

Most responding sponsors (85 percent) indicated that apprenticeship office staff had responded to questions accurately, although nearly one-quarter (23 percent) of sponsors indicated that their questions had not been answered within a reasonable time, and the same share replied that the office had not provided good, clear guidance on meeting apprenticeship standards.

Overall, sponsors who responded to the survey seem to be satisfied with the apprenticeship office's customer service, but providing timely and clear guidance can be problematic for a substantial minority. Therefore, the incoming office director may want to consider establishing response time standards and giving staff refresher training in apprenticeship policies and procedures.

During interviews, CT DOL staff indicated that since 2008 an average of nine complaints (i.e., under two per year) had been received from sponsors or apprentices. Most complaints are handled informally by the office field representatives and are not formally recorded.

### **Compliance with Federal Law: Monitoring Sponsors**

As noted earlier, federal regulation requires states that administer their own programs to conduct quality assurance assessments "regarding all aspects of an apprenticeship program's [i.e., sponsor's] performance, including but not limited to determining if apprentices are receiving:

- on-the-job training in all phases of the apprenticeable occupation;
- scheduled wage increases consistent with the registered standards; [and]
- coursework through appropriate curriculum and delivery systems; and

- that the registration agency is receiving notification of all new registrations, cancellations, and completions *[sic]*...”<sup>4</sup>

In addition, for new sponsors, federal law requires provisional approval for one year, after which the apprenticeship office must review them for quality and conformity with federal regulation. Based on that review, the sponsor can be made permanent, continue with provisional approval, or be deregistered. Once a sponsor is permanent, the law requires review every five years. Sponsors also are to be reviewed regularly for compliance with equal employment opportunity and affirmative action laws.

The program review committee found no evidence of quality assurance assessments being systematically conducted by CT DOL staff to ensure compliance with federal rules. PRI staff requested copies of any prior sponsor quality evaluations that had been completed by CT DOL, but the department could not provide any. The department also indicated that sponsors are not visited for the sole intent of monitoring, but rather as part of the in-person registration process when a sponsor takes on a new apprentice. CT DOL apprenticeship office staff said that they do monitor sponsor compliance with equal employment opportunity and affirmative action laws.

Measuring sponsor compliance with federal rules is important because it determines whether applicable laws and the written agreement between the apprentice and sponsor are being followed. Specifically, it can help ensure the apprentice is receiving appropriate wages, earning credit toward apprenticeship completion for hours worked, and rotating among the various aspects of the work needed in order to completely learn the occupation. Compliance, therefore, can provide a layer of protection to the apprentice. If a sponsor is not fulfilling its responsibilities under the law, CT DOL field representatives should determine the reason, and develop a corrective action plan or make less-formal recommendations in order to bring the sponsor into compliance.

The current focus of CT DOL apprenticeship staff activities – registering and renewing apprentices – does not allow for sufficient time to add federally required sponsor compliance monitoring. CT DOL apprenticeship staff repeatedly emphasized to PRI committee staff that their current roster of expected tasks kept them very busy.

The focus of CT DOL apprenticeship staff efforts should be shifted from registering apprentices at in-person meetings (held at the sponsor’s location) to monitoring sponsor compliance, similar to how apprenticeship offices operate in most nearby states. Among the four nearby states that were examined in depth by PRI, none traveled to sponsors to register apprentices like Connecticut does. No other states examined by PRI register apprentices in-person except Rhode Island, and that state requires apprentices to come into the apprenticeship office, with set hours (12 hours weekly) to serve them.

Furthermore, although every new Connecticut apprentice is supposed to meet (individually or with a group of apprentices) with the sponsor and an apprenticeship office staff member to review the responsibilities of each party, as noted above, it is unclear whether that

---

<sup>4</sup> 29 CFR Part 29

standard is being met. About one-third of respondents to a PRI survey of apprentices indicated that they never had such a meeting.

CT DOL staff activities should be modeled on activities that are performed in other states by strengthening compliance activities. Shifting work responsibilities from registering apprentices at in-person meetings at the sponsor's location, which has been the focus of field staff's workload, to actively monitoring sponsors could alleviate some of the issues that were raised throughout this study's research, including in public hearing testimony provided to the committee in October 2015. Therefore, **the program review committee recommends:**

**1. The Connecticut Department of Labor's apprenticeship office should discontinue in-person registration for new apprentices and dedicate substantial staff time to sponsor monitoring.**

- a) **Upon apprentice registration, materials should be mailed to each new apprentice that include the "Apprentice Handbook & Progress Report" along with an easy-to-understand one-page explanation of apprentice and sponsor responsibilities. If an apprentice switches sponsors, just the one-page explanation should be mailed to the apprentice, reminding him or her of each party's responsibilities.**
- b) **The state labor department should establish a rotating schedule, along with a plan, to monitor sponsor compliance with federal and state laws and regulations. In addition to the annual review required for new sponsors by the federal government, each sponsor should be reviewed every five years per federal regulation.**
- c) **Either the U.S. Department of Labor apprenticeship office's quality assurance form or a common form developed by the Connecticut labor department should be used for each sponsor. Data from the form should be collected and aggregated so the department can track problem areas across sponsors. During an on-site compliance review, the Connecticut labor department should check on the Apprentice Handbooks of those apprentices who are on premises to make sure the handbooks' logs of on-the-job training hours are being kept up-to-date and signed, apprentices are being rotated in different work tasks, and coursework progress is being made. Connecticut labor department staff should also check on recent apprentice wages to ensure the wage progression schedule is being followed.**
- d) **Every sponsor identified by a review as seriously out of compliance (as defined by the department) shall be subject to random visits by field staff to ensure the sponsor has implemented any recommendation that was determined to be needed at the time of the review.**

- e) **Beyond routine monitoring, Connecticut labor department staff should focus on those sponsors that continually fail to register new apprentices within the federally required 45 days of hiring. A special effort should be made to contact apprentices who are employed by those sponsors to remind them of the consequences of no registration (i.e., no credit earned towards hours needed for completion of apprenticeship).**
- f) **The results of any compliance review conducted by the Connecticut labor department should be accessible and linked to the sponsor list that is maintained online.**

## **Data System**

**Current CT DOL system.** Program review committee staff reviewed the data system that CT DOL currently uses to track apprentices and sponsors and found that it has several limitations. It is an Access database that is cumbersome to use and does not generate quality management information that would allow the apprenticeship system in Connecticut to be better understood. Rather, it is primarily used as a case management tool to track individual apprentices and send out registration renewal notices, as well as apprenticeship completion letters.

While the employment history and number of credited hours of a single apprentice can be tracked by the office, aggregated information that shows overall completion rates, by cohort (i.e., all apprentices who began around the same time) is not developed by the apprentice office, for example. Furthermore, while there is a write-in comments section that shows (if it is filled in) why an apprentice left a particular employer, there is no way to categorize this information except manually to determine if there are particular trades that have higher dropout rates or particular sponsors that have difficulty in retaining apprentices. If this information were available, better interventions could be developed for new apprentices to ensure that they complete their apprenticeships.

Finally, neither sponsors nor apprentices can access the system. Sponsors cannot apply for apprentice registration online, and apprentices cannot view their information.

**Federal web-based data system.** The U.S DOL's apprenticeship office has a web-based data system available free to all states, even those with state-run apprenticeship systems. The federal data system, called the Registered Apprenticeship Partners Information Data System (RAPIDS), provides for easy data collection, updating sponsor and apprentice information, and retrieval and summarizing the data related to apprentices and apprenticeship programs. It allows sponsors to directly apply online to register new apprentices into the system by entering the apprenticeship agreement information, rather than waiting for an apprenticeship office staff person to initiate the process. Once an apprenticeship staff person approves the registration, the sponsor can generate a registration card and print it out. Each apprentice must carry a registration card if employed in a licensed occupation.

The federal data system will undergo some modifications that are anticipated to be rolled out sometime in summer 2016, and the system will be renamed RAPIDS 2.0. The new version

will allow sponsors to renew apprentices and print out renewal registrations for existing apprentices. Many of the system changes are still being developed by U.S. DOL staff; it is expected, however, that RAPIDS 2.0 will allow for additional types of information to be captured about apprentices and sponsors in order to provide better management information. For example, it would be helpful if the system would be able to track completion rates by cohort and allow “read only” access to an apprentice for tracking one’s own progress. The federal labor department has not yet determined whether the system will provide for this capability but is soliciting suggestions from states in order to make the new system as useful as possible.

**Possible CT DOL use of federal data system.** Despite the uncertainty around the precise additional capabilities, PRI believes moving to the federal data system would offer several benefits. It would allow for quicker registration of apprentices by sponsors, free up CT DOL staff so they can focus on monitoring sponsors as recommended above, and come at no cost to CT DOL. Furthermore, the concept of web-based apprentice registration was legislatively proposed in 2003, which required the labor commissioner to report no later than February 4, 2004, on the feasibility of establishing an online apprenticeship registration system. No such system, however, was ever established.

Online – as well as quicker – apprentice registration is also desired by sponsors. Nearly half of sponsors who responded to the PRI committee’s survey (48 percent) said that the top improvement to apprenticeship administration would be providing online apprentice registration. Also, as noted above, about 30 percent have had a problem with getting timely registration. During this study, the program review committee received a few complaints from sponsors who complained of a registration backlog at the apprenticeship office. The consequences for delayed registration due to backlogs from paper processing can be severe. If the apprentice is going to be a new employee in a licensed occupation, hiring cannot occur legally because without registration, the person is considered an illegal worker so the sponsor could be subject to enforcement action from the Department of Consumer Protection (DCP). Also, if a worker is hired, regardless of whether the occupation is licensed, the worker is not credited with the hours needed for completion because the worker is not registered.

From conversations with U.S. DOL staff, it seems that transitioning to RAPIDS 2.0 would be relatively easy, as well as free of direct costs. The change could be implemented at any time. Federal staff would directly train CT DOL staff on how to input information and what can be produced from the system. U.S. DOL staff recommend that new apprentice registrations be the first apprentices/sponsors inputted into the system, followed by active apprentices. Inactive apprentices and sponsors could be archived.

Currently, nine of the 25 states that operate state-administered apprenticeship programs use the federal data system, entirely for free. One additional state, Maine, has decided to move to the federal system beginning early in 2016. Rhode Island, another New England state that oversees its own apprenticeships, is also considering moving to RAPIDS.

The federal system allows for a variety of tasks to be performed such as registering programs and apprentices, managing cases, creating compliance and quality reviews, and generating status reports. PRI believes that instead of expending state dollars to create a new system with more data capabilities, Connecticut should use the available federal system.

Moving to the federal data system will provide Connecticut's apprenticeship office with a way to register apprentices online and more easily produce certain information helpful to managing the apprenticeship system. Given the inadequacies of the CT DOL data system at tracking apprentices and sponsors, and the inability of the system to allow for online registration, **the PRI committee recommends:**

**2. The Connecticut Department of Labor should transition to the U.S. Department of Labor apprenticeship data system. The Connecticut labor department should discuss with the federal labor department the details of transferring to the federal data system RAPIDS 2.0 in summer 2016, including timeframes for the transfer, the data to be transferred, and staff training.**

## Website

The Connecticut apprenticeship office's website should be the go-to place for potential and active apprentices and sponsors to find accurate, complete information that is easily located. The current website falls short of all three standards.

An examination of the CT DOL Office of Apprenticeship Training's website shows it lacks: some basic information on apprenticeships, sponsors, and coursework providers; and does not include comprehensive (yet concise) and easy to find information. Some of the challenges identified by PRI are:

- how to become an apprentice is layered so deep from the main website it takes numerous clicks to arrive at that web page;
- information on all occupations that are apprenticeable and whether there are current apprentices in them is inaccurate and in many cases missing;
- sponsors with current apprentices participating in apprenticeships versus those that have participated in the past are not clearly identified; and
- important coursework information is missing, such as a complete listing of apprenticeship coursework providers and each program's cost.

One example of the poor quality and confusing information on the office website can be demonstrated using coursework providers. PRI staff attempted numerous times to obtain a listing of coursework providers, where they were located, the occupations that were covered by them, and the program cost. The apprenticeship office website has a link to a list of some of the coursework providers off the main apprenticeship page, at a link called "Credit Listings." A link to "Schooling/Related Requirements" takes one to a bulletin on a safety course requirement as well as to only the technical high schools' handbooks for three construction occupational areas (plumbing, electrical, and heating/cooling). PRI found:

- *12 private occupational and industry-related schools are listed but only seven are actually approved by the department to provide related instruction;*

- *three additional private occupational schools and three additional industry-related schools that are approved are not listed on the website;*
- *none of the 19 labor-management partnerships are listed, except for those few that are currently recruiting apprentices;*
- *none of the community colleges are listed, and neither is a recently-approved private nonprofit college;*
- *there are no links to the technical high schools' apprenticeship coursework website, or to the website of any other coursework provider; and*
- *there is no information letting individuals know that they can request that schooling given by a provider that is not approved may be separately evaluated by CSDE as to whether it can be counted towards the coursework hours needed and that a recommendation be forwarded to CT DOL, which retains the final approval authority.*

PRI believes that the errors, misinformation, and omissions on the CT DOL apprenticeship's office website need to be corrected. A complete redesign of the site to update the look and make navigation more user-friendly could also benefit apprenticeship promotion efforts. Therefore, **the PRI committee recommends:**

**3. The Connecticut Department of Labor should revamp its apprenticeship website with clear and comprehensive information for potential and current apprentices, sponsors, and coursework providers. The website should be regularly updated and include links to appropriate sources of information, such as all approved coursework providers' websites.**

## **Apprenticeship Promotion**

All state apprenticeship offices are expected by the federal government to promote apprenticeship by enrolling apprentices and sponsors, offering it in suitable occupations and in multiple models, and marketing it. In interviews with PRI staff, then-CT DOL apprenticeship managers indicated that they promote apprenticeship opportunities throughout the year in several ways. They stated apprenticeship staff attend job fairs, network and present at various industry and business association meetings, meet with students and instructors at the Connecticut Technical High Schools, and work with pre-apprentice training programs operated by community organizations, such as Jobs Funnel, to help get qualified individuals into registered apprenticeship programs. Apprenticeship office staff also noted they would like to undertake more marketing and promotional efforts but had so far lacked the necessary resources to go beyond their traditional activities. No data were available on the frequency or depth with which promotional activities happen.

## Enrollment

**Apprentices.** Connecticut has more apprentices, on a per capita basis, than nearly all other states. A recent think tank study of apprenticeship rates indicated Connecticut joined Alaska, Iowa, Indiana, and West Virginia in having the highest rates, in 2013. Interestingly, those other four states all have federally-run apprenticeship offices.<sup>5</sup> This fall (2015), Connecticut continued to have more apprentices than the nearby states examined in this study, on an estimated per capita basis.<sup>6</sup>

**Sponsors.** Connecticut also has more active sponsors (1,568) than the nearby states examined (from 650 to 1,439). Connecticut's average number of apprentices per sponsor (3), however, is just a little more than the less-populous nearby states (2), and well under Massachusetts and New Jersey (5 and 8, respectively).

**Overall.** The reasons for high apprentice and sponsor enrollment are debated but unclear. Connecticut seems to have more licensed occupations than nearby other states (e.g., auto glazier, glazier, gasoline tank installer and repairer), and in this state, licensure in trades-type occupations mandates apprenticeship or similar training. However, PRI did not have time to explore whether state licensing reach is correlated with high apprenticeship rates. Additional potential factors have also been discussed in the literature and in program review committee staff interviews for this study. These include the strength of: unions, company enthusiasm, manufacturing and construction industries, government subsidies offered to participating employers, and apprenticeship marketing.<sup>7</sup>

## Occupations

Connecticut apprenticeships are available in numerous trades and industries. There are apprentices learning more than 80 trades among the automotive, construction, manufacturing, service technician, energy, and emergency response fields. Active apprentice occupations (those occupations which currently have apprentices) are listed in Figure 1-3 and grouped by occupational category. The figure additionally shows whether state occupational licensure is required for post-apprenticeship work. More than half of the 83 active apprentice occupations (49 occupations, or 59 percent) do not require a license to work upon apprenticeship completion.

There are also 77 apprentice occupations that are inactive (i.e., no apprentices currently). It is unclear which programs are considered obsolete and which are only temporarily without apprentices, due to lack of interest.

Each apprentice occupation has a certain amount of on-the-job training hours and coursework hours that must be completed. In addition, the training and coursework are to cover

---

<sup>5</sup> Olinsky, Ben, and Sarah Ayres, *Training for Success: A Policy to Expand Apprenticeships in the United States*, Center for American Progress. Accessed July 22, 2015 at: [https://www.americanprogress.org/wp-content/uploads/2013/11/apprenticeship\\_report.pdf](https://www.americanprogress.org/wp-content/uploads/2013/11/apprenticeship_report.pdf)

<sup>6</sup> PRI staff analysis, based on October 2015 apprentice counts provided by state apprenticeship directors and on U.S. Census Bureau population data (Population Estimates, State Totals: Vintage 2014, accessed November 9, 2015 at: <http://www.census.gov/popest/data/state/totals/2014/index.html>).

<sup>7</sup> See, for example, Olinsky and Ayres.

**Figure 1-3: Types of Active Registered Apprenticeships in Connecticut, June 2015**

		LICENSED OCCUPATIONS <sup>1</sup>	UNLICENSED OCCUPATIONS
AUTO	<b>Automotive</b>	Auto glazier	<i>None</i>
	<b>Electrical</b>	Cable splicer Electrician: 4 types	Electrical draftsman Electrician – Industrial maintenance
BUILDING	<b>Plumbing, Heating, Piping, and Cooling</b>	Gas and oil burner: 3 Heating, piping, and/or cooling: 7 Plumbing and related: 4	Heating and cooling mechanic – Industrial maintenance
	<b>Other Building Trades</b>	Construction craft laborer <sup>2</sup> Elevator-related: 2 Fire / sprinkler: 2 Glazier Sheet metal: 3	Bricklayer Carpenter Cement finisher Drywall finisher Iron worker Millwright Painter: 3 Terrazo and tile: 2 Heavy equipment: 2 Pointer, caulker, cleaner Roofer: 2
MANUFACTURING & METAL	<b>Metal</b>	<i>None</i>	Machinist: 2 Tool/die: 3 Mold and model maker: 2
	<b>Machine Trades</b>	<i>None</i>	CNC wireforming Plastic: 1 Screw machine: 1 Tool: 4 Electroplating technician Machine and machinist: 8 Quality control and assurance: 1 Springmaker: 1
SERVICE	<b>Service and Technician</b>	Gasoline tank installer and repair Lawn sprinkler installer/maintainer Pump servicer and installer Stationary engineer Telephone installer and servicer	Insulator: 2
	<b>Other</b>	<i>None</i>	Firefighter Nuclear plant: 2

Notes:

<sup>1</sup>A number after a trade name indicates the number of apprenticeship types within the trade. The different types are listed in Appendix C.

<sup>2</sup>May qualify for a P-6 license.

Source: PRI staff using CT DOL information.

particular areas related to the occupation to ensure the apprentice acquires skills and experience in all aspects of it.

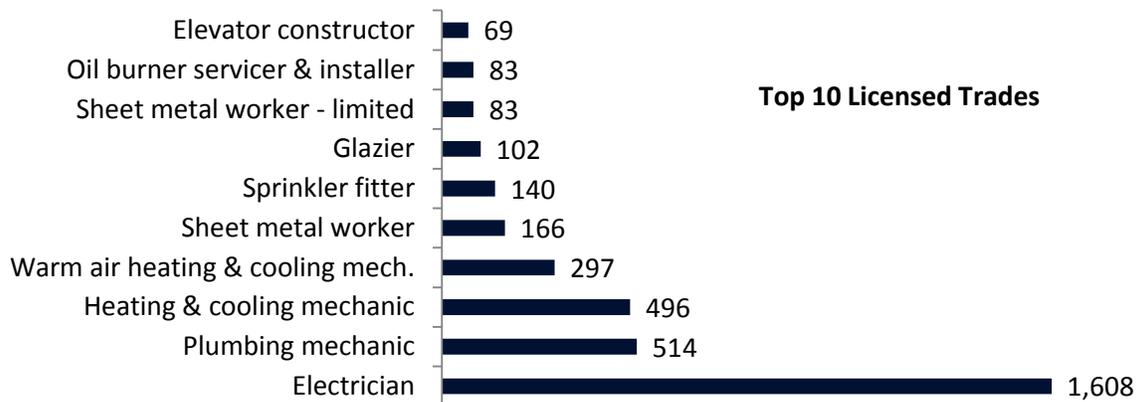
The requirements of an apprenticeship depend on the complexity of the occupation. To qualify as an apprenticeship under the federal criteria, there must be a minimum of 2,000 hours in on-the-job training – which equates to 50 forty-hour work weeks – and typically at least 144 hours of coursework (also called “related instruction”) per year of the apprenticeship. Most apprentice occupations require four years for completion, provided the person continues to work throughout (e.g., is not laid off, fired, or incapacitated). The specific requirements for each apprentice occupation (in addition to the number of apprentices, as of June 2015) are listed in Appendix E.

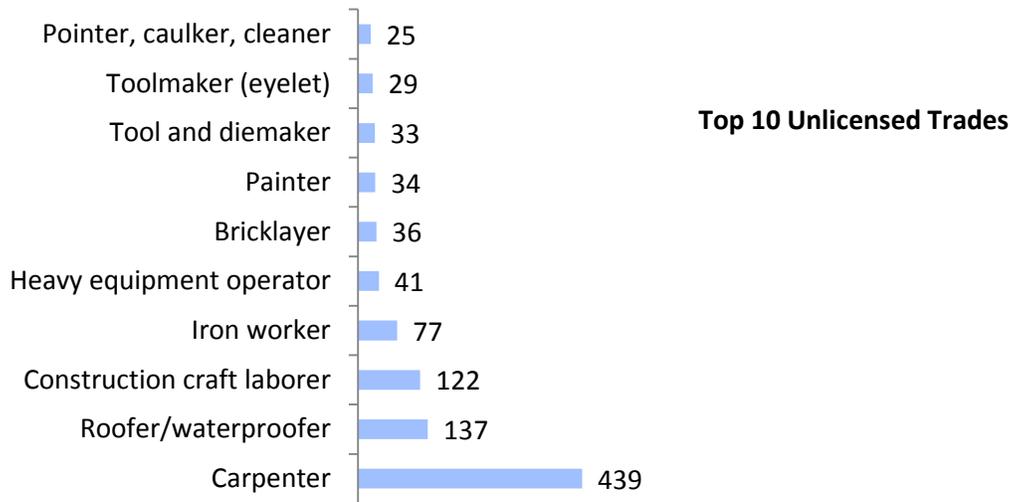
For the licensed occupations in the trades, a period of training – generally in the form of an apprenticeship – is mandatory before a person is allowed to take a Connecticut state examination and become licensed. In Connecticut, licensed trades include, but extend far beyond, plumbers and electricians. Some licensed occupations have training that is overseen by the Department of Consumer Protection, not CT DOL, as discussed in Chapter 4.

For unlicensed occupations, such as carpenters and most manufacturing occupations, formal training (e.g., an apprenticeship) may be offered but it is not required. Apprenticeship completion in an unlicensed occupation results in an industry-recognized credential issued by the State Apprenticeship Council. In interviews, PRI staff was told anecdotally that apprenticeship completion rates for unlicensed trades were lower. The theory is that as the individual advances through the apprenticeship, the skills needed to secure a position are acquired without fully completing the program. The committee was unable to further examine this theory given the study’s time constraints.

Figure 1-4 below shows the trades with the most apprentices, separately by licensed and unlicensed trades. The top ten programs accounted for 89 percent of all apprentices in licensed trades and 80 percent for unlicensed. Most apprentices (77 percent) were in the 32 licensed trades that have apprenticeships.

**Figure 1-4: The Trades with the Most Apprentices, June 2015**





Source: PRI staff analysis of CT DOL data.

In the future, apprenticeships in Connecticut likely will expand into other industries. Connecticut’s successful grant application for the American Apprenticeship Initiative grant announced the intention of creating apprenticeships in the health and business services sectors (including information technology, or IT), for the first time, as well as expanding apprenticeship opportunities in manufacturing, as discussed earlier in this chapter.

**Comparison.** In some occupational areas, Connecticut has more apprentice occupations than do the Northeastern states selected for inclusion in this study (Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island). In other job areas, Connecticut’s options for apprenticeships are more limited.

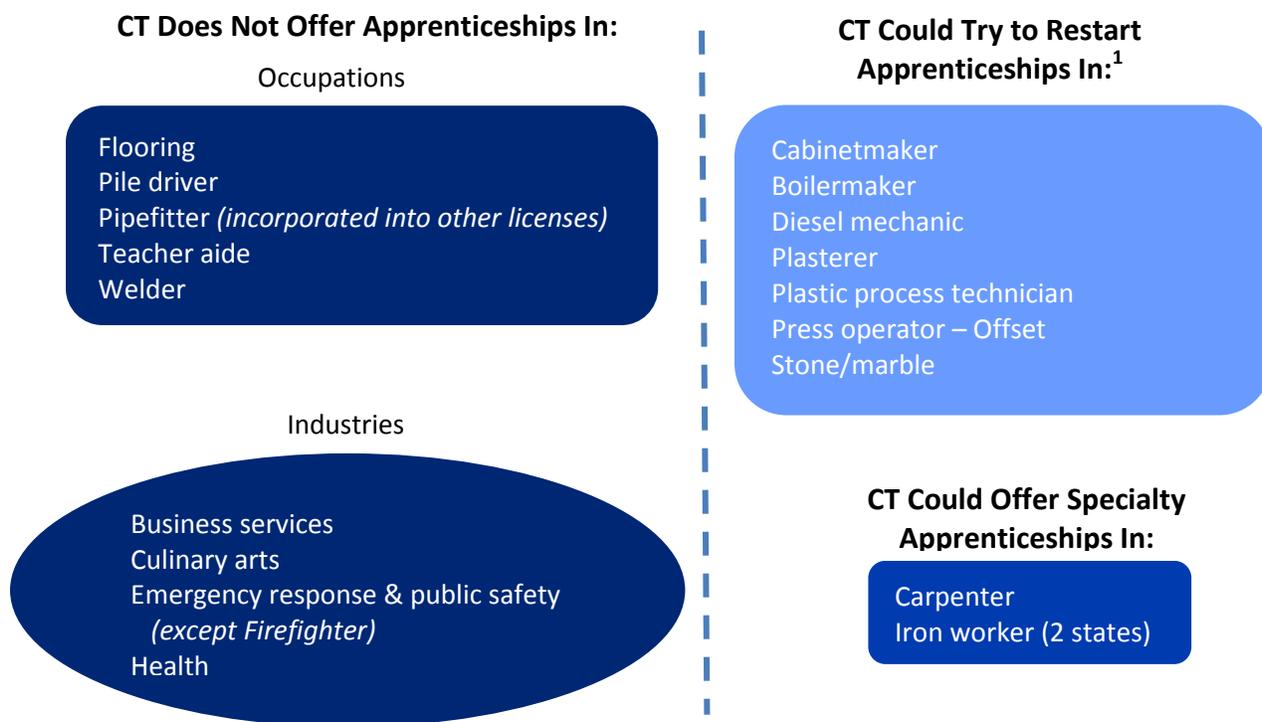
It is difficult to compare states’ apprentice occupations, for two reasons. First, states’ decisions on whether to offer specialty or general apprenticeships vary. For example, Connecticut has many more specific apprenticeships in some occupational areas (driven by highly specific licenses) – such as heating and cooling – compared to the other states, but in other areas like carpentry, Connecticut has fewer apprenticeship specialties. Second, apprentice occupations are in part determined by sectors not found in all states, such as shipping-related jobs located in major ports like in Massachusetts’ Boston. The committee’s analysis attempted to exclude these niche sectors.

*Potential growth opportunities.* With these caveats in mind, the following chart shows where there may be room to grow apprenticeships in Connecticut. In order to be included, the occupation or industry needed to have at least three of the other five states offering it currently (except where noted).

The chart shows there are five occupations and four industries in which Connecticut does not offer apprenticeships while other states do. In addition, Connecticut has in the past offered

apprenticeships in eight occupations that have apprentices in nearby states. Finally, four other states have chosen to offer apprenticeships in specific areas of carpentry (e.g., residential, rough) and two offer sub-specialties within iron working, while Connecticut has a single apprenticeship option for each.

**Figure 1-5: Potential Areas for Connecticut Apprenticeship Growth, Based on Active Apprenticeships in Five Nearby States**



Note:

<sup>1</sup> An additional occupation with apprenticeships in multiple states, childcare development specialist, was begun in Connecticut but stopped once a grant ran out. CT DOL staff reported it was not, in the end, a successful expansion.

Source: PRI staff analysis of apprentice occupations in Connecticut, Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island.

It is possible that some or all of these occupations and industries would be unsuitable for apprenticeship in Connecticut because of a lack of sponsor interest. If no license is ultimately required to work in the field, employers may just want to train individuals on their own without having to follow the rules associated with sponsoring apprentices. Alternatively, there could be unease with possibly impacting wages by introducing a new training system for those occupations or fields, or with promoting apprenticeship in lower-wage occupations (e.g., nurse assistant).

But the fact that these apprenticeships are offered in nearby states may indicate it could be worth CT DOL staff time to investigate expansions. For more ideas, the table in Appendix F

gives a comprehensive list of the occupations offered in the nearby states, as well as in Connecticut.

*Where Connecticut offers more apprenticeships.* Connecticut is unique in offering apprenticeships in some trades. These are occupations that Connecticut licenses and other states do not. They are: auto glazier; various specialty electrician and plumbing, heating, and cooling occupations; and fire suppression systems technician, to the best of the committee's knowledge. Connecticut also has a number of manufacturing occupations with apprenticeships which are not offered in other states, but overall there is little uniformity in that industry's apprenticeships across the study states.

**Overall.** As part of the PRI committee's recommended shift of Connecticut apprenticeship activities to sponsor outreach and apprenticeship promotion, **the program review committee recommends:**

**4. The Connecticut Department of Labor should consider contacting potential sponsors involved in occupations that have apprentices in nearby states but not in Connecticut, to learn whether there is interest in launching those apprenticeships here. Even if sponsors are interested, when determining whether an occupation might be appropriate for apprenticeship in Connecticut, the apprenticeship office should take into consideration existing training options and wages, and how apprenticeship might alter those.**

### **Approaches for Completion of Apprenticeships**

Historically, apprenticeships have been based on the number of training hours completed, but in 2008, two additional apprenticeship approaches were authorized by U.S. DOL. The three approaches allowed are:

1. *Time-based*, the traditional model, in which someone has completed the apprenticeship once a certain number of on-the-job training hours have been reached (as well as the required coursework finished), spread throughout various job tasks critical to learning the entire occupation;
2. *Competency-based*, in which an apprentice must show he or she has mastered the job tasks (through tests) to complete the apprenticeship, trains for at least one year, meets minimum hours requirements in each major job task, and is not held to a maximum completion length; and
3. *Hybrid*, in which the apprentice demonstrates competencies to complete the program and has a set range of hours to meet for each job task (including a limit for every task).<sup>8</sup>

---

<sup>8</sup> U.S. Department of Labor, "FAQs," March 9, 2010, <http://www.doleta.gov/oa/faqs.cfm> (accessed November 10, 2015).

The U.S. DOL adopted revised regulations in 2008 that allowed a sponsor to choose from among the three options, with the purpose of offering sponsors more choice and flexibility.<sup>9</sup> The competency-based and hybrid options might especially benefit apprentices who begin an apprenticeship with some training and skills not gained as part of a registered apprenticeship, allowing them to finish the apprenticeship more quickly. Finally, these apprenticeship models could benefit apprentices and sponsors by giving them more assurance (through the competency tests) that the apprentices have gained adequate skills.

**Connecticut and nearby states.** Connecticut’s apprenticeship office has offered mainly the time-based model,<sup>10</sup> but it may be moving toward offering competency-based and hybrid options. The state’s American Apprenticeship Initiative grant application asserted the options will be introduced as part of grant-funded activities.

The commencement of competency-based and hybrid options would benefit sponsors and apprentices – and put Connecticut in line with the nearby states examined in the study. Massachusetts, New Jersey, New Hampshire, and Rhode Island all offer the nontraditional apprenticeship models. Therefore, **the program review committee recommends:**

**5. The Connecticut Department of Labor should offer sponsors at least two of the three models of apprenticeship in the ten licensed and ten unlicensed occupations with the most apprentices by July 1, 2018.**

- a) **For each trade, the apprenticeship office should convene industry groups including at least six sponsors (three each from union-contracting companies and other companies) and, for licensed occupations, members of the relevant licensing board, to recommend sample apprenticeship on-the-job training requirements for each of (at least) two of the three possible models (time-based, competency-based, and hybrid). The State Apprenticeship Council should review the industry groups’ samples and the apprenticeship office should approve them, or approve with revisions.**
- b) **The Connecticut labor department and the Department of Consumer Protection should review statutes and regulations to determine whether any revisions are necessary to comply with federal regulation allowing all three types of models. If so, the department(s) should pursue the necessary changes.**

---

<sup>9</sup> U.S. Department of Labor, Final Rule, “Apprenticeship Programs, Labor Standards for Registration, Amendment of Regulations,” *Federal Register* 73, no. 210 (October 29, 2008): 64402.  
<http://www.doleta.gov/oa/pdf/FinalRule29CFRPart29.pdf>

<sup>10</sup> A September 2014 CT DOL press release indicated one labor-management partnership had been given permission to offer competency-based apprenticeships in four occupations. Participation so far has been small (under five people), according to partnership staff. During the study’s research, CT DOL staff stated that only the time-based option is available in the state. Furthermore, the apprenticeship requirements provided on the CT DOL website are given only for the time-based approach.

## Marketing

Due to personnel turnover within the CT DOL apprenticeship office, PRI was unable to fully understand the extent of the office's efforts to promote apprenticeship to potential sponsors and apprentices. While a few conversations between apprentice and program review committee staff touched on marketing, there was little specific information shared (except regarding manufacturing), and no data on number of job fairs visited annually, share of staff time spent on recruitment, industry or business conferences attended, outreach to community organizations, or similar activities were available.

Results from the PRI committee survey of sponsors suggest there may be room for improvement in apprenticeship promotion efforts to potential sponsors and apprentices. Over one-third of responding sponsors indicated that the apprenticeship office overall does a poor job of marketing apprenticeship to potential apprentices and potential sponsors (36 and 37 percent, respectively).

**To potential sponsors.** There are several financial incentives for employers in certain industries to sponsor apprentices. The incentives range from federal grants to tax credits.

*American Apprenticeship Initiative.* A major effort by the office over the last year was applying for a federal American Apprenticeship Initiative (AAI) grant. Based on the application, the state was notified that it will receive a \$5 million AAI grant, over the next five federal fiscal years (FFYs) beginning in FFY 16. The state's goal, as given in the AAI application, is to register 1,000 new apprentices and 500 pre-apprentices in manufacturing, healthcare, and business services, which have not traditionally participated in apprenticeships in large numbers, according to CT DOL staff. As part of the AAI grant, the office intends to dedicate a staff person to work with one-stop job centers in the state to encourage individuals to become apprentices. The grant also will offer funds to apprentices and/or sponsors for the coursework and training components of apprenticeships in advanced manufacturing, healthcare, and business services occupations.

The American Apprenticeship Initiative grant application showed evidence that the apprenticeship office spent substantial time contacting a variety of employers – including Electric Boat, hospitals, and smaller manufacturers – in an effort to persuade companies to participate in apprenticeships.

One of the six staff who works directly with employers and apprentices has been assigned solely to manufacturing sponsors. Targeted recruitment efforts to foster growth in manufacturing apprenticeships have included participation in several employer associations, as well as in the Statewide Advanced Manufacturing Advisory Committee, and talking with students in community college manufacturing programs. Manufacturing recruitment has been assisted by a push from a few of the state's large manufacturers to have better-skilled labor in their parts-supplying companies. The American Apprenticeship Initiative grant application noted some of the funding will be used for sponsor recruitment.

*Manufacturing Incentive Fund.* Sponsor recruitment in manufacturing also likely will be aided by the state's Manufacturing Incentive Fund (MIF) reimbursements to qualified sponsors

and will likely further assist in sponsor recruitment in manufacturing, with an allocation of about \$7.8 million over the next two years. The Fund's Apprenticeship Program (as the incentive package is called), which began in summer 2015, is administered by the Department of Economic and Community Development with assistance from CT DOL. The program consists of partial reimbursements to manufacturers for new apprentices' wages, coursework costs, and credentials. The three components each have maximum amounts, with a combined top amount of \$9,500 and \$9,250 for each apprentice's first and second years, respectively. The fund's goal is to boost the number of manufacturing apprentices from about 200 to 500 over the next two years.

The office will be under pressure to meet the AAI grant goal of 1,000 new apprentices within the next five years, as well as the MIF goals. Strong outreach to potential sponsors to design a program and existing sponsors to expand their programs will be needed to meet this challenging goal.

*Company tax credits.* State corporate tax credits for certain companies with apprentices have been available since 1979.<sup>11</sup> Construction and plastics-related employers may be able to receive up to \$4,000 and \$4,800, respectively, in corporate tax credits per apprentice. Manufacturing employers may be eligible for up to \$7,500 in credits per apprentice (available for multiple years, for each apprentice).<sup>12</sup> In order to claim the credits, employers are to complete an online worksheet and submit it to CT DOL for approval. Because some employers structure their businesses in a way that they do not pay corporate income tax, which makes them ineligible for corporate tax credits, recent legislation (P.A. 14-217) allows companies to sell, assign, or transfer their credits to other companies that would be able to use them.<sup>13</sup> However, it does not seem that this option has been widely used, according to program review committee staff interviews.

*Company wage subsidies from Step Up.* Small and medium-sized manufacturers in certain towns may be eligible for wage subsidies for new registered apprentices and pre-apprentices, under CT DOL's Subsidized Training and Employment Program, known as Step Up. Step Up's apprenticeship component took effect in July 2014. It offers manufacturers with no more than 100 full-time employees a wage subsidy for hiring apprentices or pre-apprentices who are high school or postsecondary students. The subsidy begins at 100 percent of wages for the individual's first 30 days and gradually declines to 25 percent, before stopping at the six-month point. The overall subsidy is capped at \$10 per hour.<sup>14</sup>

**To potential apprentices.** Apprenticeship personnel told committee staff that apprenticeship is promoted to potential apprentices through:

- booths at job fairs;
- visits to department heads and students at the state's technical high schools; and

---

<sup>11</sup> C.G.S. Sec. 12-217g

<sup>12</sup> Ibid.

<sup>13</sup> Ibid.

<sup>14</sup> Connecticut Department of Labor, "Step Up for Apprentices: Apprenticeship Subsidized Training and Employment Program,"

[https://www.ctdol.state.ct.us/progsupt/appren/2015/Revised\\_Step%20Up%20for%20apprentices%20fact%20sheet%206-16-15.pdf](https://www.ctdol.state.ct.us/progsupt/appren/2015/Revised_Step%20Up%20for%20apprentices%20fact%20sheet%206-16-15.pdf) (June 15, 2016).

- pre-apprenticeship programs such as YouthBuild.

In addition, the American Apprenticeship Initiative grant application indicated the state is planning to use funds to better familiarize CT DOL job center staff with apprenticeship. The intention is that job center staff then would be more comfortable with introducing apprenticeship to job-seekers, and connecting them with apprenticeship opportunities. Very few apprentices seem to come from job center referrals or other center activities – just one percent of apprentices who responded to a program review committee survey had found their positions that way.

About half of apprentices seem to come to their positions through family or friends. Some are referred by their high school, college, or private occupational school – or by their employer, who suggests apprenticeship after hiring (19 percent of apprentice survey respondents, and 27 percent of sponsor survey respondents). Very few apprentices (2 percent of survey respondents) first heard about their position through the CT DOL website or a department-sponsored career fair.

### **Supply of and Demand for Apprentices**

**Supply.** There appears to be a sufficient number of people interested in becoming apprentices for the labor-management partnerships. Nearly all the labor-management partnerships reported having more applicants than spaces to fill, even this year, when many partnerships were ramping up apprenticeship programs after several years with intentionally few apprentices. Information on candidate pool scope and depth from other types of sponsors was unavailable, though it may be useful to note that under a quarter of sponsor survey respondents wanted more assistance from CT DOL in recruiting apprentices.

Sponsors and others with whom committee staff spoke identified two potential barriers to increasing interest in and eligibility for apprenticeships among youth. First, a few interviewees mentioned they perceive a continued bias toward college and against the trades, among secondary-level teachers, students, and parents of those students – even in the technical high school system. The extent to which those views persist is unclear. There may also be some difficulty generating interest in manufacturing positions.

Second, some sponsors stated that many potential apprentices lack necessary math skills. One labor-management partnership’s director said his program had lowered the passing score on its math screening test to the sixth grade level, in order to have an adequate candidate pool. A wide variety of efforts is underway to attempt to improve math skills, as well as graduation rates, which would make a larger group of people eligible for apprenticeships. For example, the Hartford area’s workforce board has a program called Jobs Funnel, aimed at preparing people to become apprentices. The program helps residents improve math skills and employability to make them strong candidates for apprenticeships in the construction and manufacturing industries.

**Balance between supply and demand.** Employers and labor-management partnerships take on apprentices to increase the number of workers in an occupation, particularly for a licensed occupation. In general, the supply of new apprentices naturally balances with how many workers overall are currently needed. Companies and labor-management partnerships generally

only take on apprentices if there is enough work for them. Apprenticeships are dissimilar to postsecondary education, in that way. College students choose a course of study and may find few jobs available upon receiving a degree or certificate; apprentices begin apprenticeship and immediately have a job that likely will continue past apprenticeship completion.

Once apprentices have completed their apprenticeship, they transition to journeypersons (i.e., experienced workers), where there theoretically could be an imbalance between the number of journeypersons produced and needed. However, anecdotally it seems that most, if not all, new journeypersons stay with their apprenticeship sponsors, at least in the short-term. Many sponsors participate in apprenticeship as a way to grow or maintain their workforces over several years. More than three-quarters (79 percent) of sponsor survey respondents indicated they participate in apprenticeship as a way to help build a skilled workforce in the industry (not necessarily in their company), the top motivation, by far, for participating in apprenticeship. The second most-frequent motivation was the ability to shape new employees from the start (i.e., no bad habits to unlearn), at 67 percent, implying many expect their apprentices to stay on.

*Data.* Supply and demand can also be reviewed based on CT DOL data. The number of apprentices (i.e., future supply) can be compared to the number of projected job openings, for each occupation, to see whether there appear to be enough (or too many) apprentices in the pipeline.

This analysis should be considered with a high level of caution for three important reasons. First, the ability to forecast job availability is limited. Second, a portion of entry-level apprentices drops out so not all apprentices become journeypersons. Third, for unlicensed trades, apprenticeship is not required. Entry-level workers who do not become registered apprentices are not captured as part of the projected supply.

Mindful of these serious limitations, analysis of CT DOL apprentice counts and projected job openings for 28 active apprenticeship occupations is shown in Table 1-1. The highlights are:

- Nearly two-thirds (18) of the occupations appear to be under-enrolling apprentices to meet projected demand for journeypersons;
- One-quarter (7) seem to have too many apprentices; and
- A few (3) appear to have the right number of apprentices to meet projected demand (i.e., the number of apprentices is between 90 and 110 percent of projected demand).

Limiting the analysis to the nine licensed trades that have matching occupational titles in the CT DOL projections, about half (five) appear over-supplied. Two seem balanced and two under-supplied.

For the unlicensed trades, the gap between apprentice enrollment and projected openings could represent room for CT DOL to recruit more sponsors in those occupations, instead of being taken as predicting a workforce shortage. Better information should be gathered (e.g., talking directly with industry employers), however, before such a step is undertaken.

**Table 1-1: Projected Supply and Demand for Apprentice Occupations, June 2015**

Occupation <sup>1</sup> (License Type, Where Applicable)	Shortfall (-) or Excess	Projected Need	Projected Supply (Number of Apprentices) <sup>2</sup>	Percent of Projected Demand Met
<b>Electrical</b>				
Electrician – Low voltage (L-6)	5	58	63	109%
Electrician (E-2)	644	964	1608	167%
<b>Plumbing, heating, cooling</b>				
Heating and cooling mechanic (S-2)	-20	516	496	96%
Plumber, pipefitter, steamfitter (P-2, P-6)	-335	900	565	63%
<b>Other building trades</b>				
Bricklayer	-52	88	36	41%
Carpenter	-633	1,072	439	41%
Cement finisher	-60	68	8	12%
Construction craft laborer	-474	596	122	20%
Drywall finisher	-9	28	19	68%
Elevator installers and repairers (R-2, R-6)	11	71	60	118%
Glazier (FG-2)	42	60	102	170%
Heavy equipment mechanic	-84	108	24	22%
Insulation worker, floor, ceiling, and wall	9	10	19	190%
Insulation worker, mechanical	-33	34	1	3%
Ironworker	-7	84	77	92%
Millwright	-34	40	6	15%
Painter	-173	207	34	16%
Roofer/waterproofers	73	84	157	187%
Sheet metal worker (SM-2 and SM-4)	33	216	249	115%
Tile setter	-12	12	0	0%
<b>Service and technician</b>				
Auto glazier (AG-2)	24	7	31	443%

**Table 1-1: Projected Supply and Demand for Apprentice Occupations, June 2015**

Occupation <sup>1</sup> (License Type, Where Applicable)	Shortfall (-) or Excess	Projected Need	Projected Supply (Number of Apprentices) <sup>2</sup>	Percent of Projected Demand Met
Telephone equipment servicer and installer (T-2)	-13	62	49	79%
<b>Manufacturing</b>				
CNC machinist	-323	342	19	6%
Machinist	-852	870	18	2%
Maintenance mechanic	-412	416	4	1%
Model makers	-15	16	1	6%
Painter – Industrial coating and lining	-2	9	7	78%
Tool and diemaker	-51	84	33	39%

Notes:

<sup>1</sup>Many of the apprentice occupations did not match with occupation titles in the CT DOL occupational projection dataset. This table excludes apprentice occupations without projection matches.

<sup>2</sup>This column provides the number of registered apprentices in the occupation. To develop the “Projected Need” column, the average number of annual job openings was multiplied by the apprenticeship length. For example, a sheet metal worker apprenticeship is typically four years long. The average number of annual job openings was multiplied by four (to get the number of annual job openings over the next four years) because over the next four years, the current apprentices (i.e., projected supply) should finish their apprenticeships. Therefore, the analysis attempted to compare whether there was a sufficient number of apprentices in the pipeline to meet projected need for journeypersons in the same occupation.

Sources: PRI staff analysis of CT DOL Office of Research Labor Market Information, 2012-22 State of Connecticut Occupational Projections (accessed October 6, 2015 at: <http://www1.ctdol.state.ct.us/lmi/projections.asp>) and of CT DOL apprenticeship information.



---

# At Work: On-the-Job Training

An apprenticeship's requirements depend on the connected occupation's complexity. To qualify as an apprenticeship under the federal criteria, there must be a minimum of 2,000 hours of on-the-job training – which equates to 50 forty-hour work weeks – as well as coursework (with 144 hours recommended for every year of training). As noted in Chapter 1, an apprentice must train on the job for between one and six years. The Connecticut Department of Labor (CT DOL) establishes the minimum number of on-the-job training hours for each occupation, but a sponsor may choose to require additional hours.

This chapter explains issues and makes recommendations related to apprentice registration renewal by sponsors and the process through which sponsors can apply to CT DOL for exceptions to the state-regulated ratio of apprentices to journeypersons (i.e., an experienced worker who, for licensed occupations, holds a license). It also provides information on wages for apprentices and journeypersons in selected apprentice occupations.

## Registration

### Initial

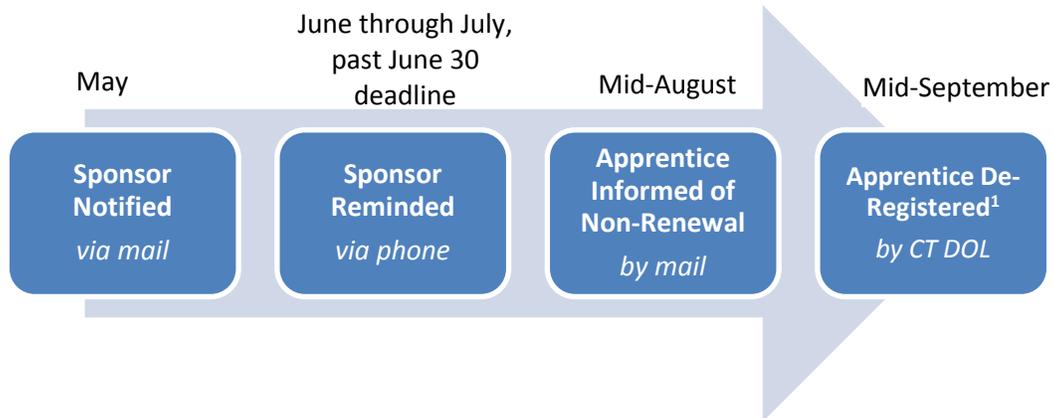
To qualify as an apprentice, a person must be registered with CT DOL. The registration consists of a completed form (called the apprenticeship agreement), signed by the apprentice and a sponsor, which is the employer or a labor-management partnership. The form provides CT DOL with basic information on the apprentice and the apprenticeship. The form may be either completed in person at the sponsor's location with a CT DOL representative, who reviews the apprentice and sponsor responsibilities with each party present, or mailed to CT DOL, with the responsibilities review meeting at a later date (e.g., within a few weeks or months).

Registration also involves paying a fee to CT DOL, \$60 from the sponsor and \$50 from the apprentice. The sponsor may choose to pay the apprentice's share, or pay the entire \$110 to CT DOL and take the apprentice's share out of the apprentice's paycheck.

### Renewal

To maintain the apprenticeship, a sponsor and apprentice must pay a registration renewal fee every year by June 30. The renewal requirement is mentioned in the CT DOL apprentice handbook, at registration meetings with CT DOL, and on the department's website. The state labor department annually notifies sponsors and apprentices of the need to renew registration, through the process depicted in Figure 2-1. The renewal fee is to be accompanied by two forms, one each from the sponsor and apprentice. However, it is the sponsor who submits the forms and fees to CT DOL. Both forms ask for basic information: name, address, date of birth (for the apprentice), identification number (for the sponsor), and occupation.

**Figure 2-1: Registration Renewal Reminder Process**



Note:

<sup>1</sup>De-registration is retroactive to July 1 and hours are not credited if the fee is not submitted by mid-September.

Source: PRI staff, based on conversations with CT DOL personnel.

There are multiple problems with the renewal reminder and de-registration process:

- The apprentice is not directly contacted until the fee is more than a month overdue, and even then, the apprentice receives only one notice before being de-registered;
- If the notice is lost in the mail or sent to a wrong address, as CT DOL reports about 10 percent are, the apprentice might not find out for a while that the renewal fees were never sent in, which means the apprentice is not accruing apprenticeship hours and is working illegally if in a licensed occupation; and
- The process is resource-intensive, using paper, envelopes, postage, and staff time to send out hard copy reminders to every active sponsor (and when necessary, apprentices), and using extensive staff time for calls to the 20 percent of sponsors who do not respond to the mailing.

PRI believes that a higher level of apprentice involvement in the renewal process could help ensure apprentices remain registered and get credit for on-the-job training. Throughout the study, the program review committee and its staff repeatedly heard that entry-level employees in licensed occupations were working for months and sometimes years without being registered apprentices. In some cases, people alleged that the company had said the registration had been completed, or had been renewed. People who are working in a licensed trade at entry-level but are not registered apprentices, or whose registration has lapsed, cannot (under current practices) receive any credit toward apprenticeship completion for the on-the-job training hours or skills gained. More than a quarter (28 percent) of apprentice survey respondents in licensed occupations reported they had previously worked in the same occupation without being an apprentice (i.e., worked illegally because they were neither apprentices nor licensed journeypersons).

Therefore, **the PRI committee recommends:**

**6. The Connecticut Department of Labor should change the apprenticeship registration renewal process in the following ways:**

- a) **Apprentices and sponsors should both be reminded multiple times before and after the renewal fee due date.**
- b) **The office should use its computer system to e-mail pre-due date reminders to those apprentices and sponsors with e-mail addresses on file.**
- c) **After the fee due date, the office should call both apprentices and sponsors before a deregistration notice is sent by mail and e-mail.**
- d) **The renewal form from the apprentice should be revised to include:**
  - **the apprentice's on-the-job training hours earned, in total, at the point of submission;**
  - **a note on the apprentice's progress or status regarding coursework; and**
  - **dated signatures from both the apprentice and a sponsor representative attesting to the information's accuracy.**

**In addition, the apprentice renewal form should instruct the apprentice to make a copy of the form and keep it until the apprentice has fulfilled all requirements of apprenticeship and, if applicable, become licensed.**

Adjusting the renewal form to include apprenticeship status each year will keep all parties informed of the progress made and requirements left to fulfill.

## **Termination**

When an apprenticeship has ended short of completion, the sponsor is expected to notify the appropriate CT DOL apprenticeship field representative of the termination, as stated in the Apprentice Handbook. However, notice is rarely given, according to CT DOL staff. Instead, most terminations are discovered as part of the registration renewal process. Information on the reasons for termination could be useful in monitoring sponsors (particularly those who employ many apprentices). The program review committee believes that the Chapter 1 recommendations regarding increased compliance monitoring of sponsors and the federal data system's capability for sponsors to update the apprentice status directly online, will assist in ensuring more timely notification by sponsors of apprentice terminations.

## **Apprentice-to-Journeyman Ratios**

### **Job Site Ratio**

Many states, including Connecticut, have adopted schedules for the maximum number of apprentices allowed on a job site or at a company, based on the number of journeymen there

are. Connecticut’s job site ratio is 1 apprentice: 1 journeyman, which means for every apprentice, there must be at least one journeyman on site.

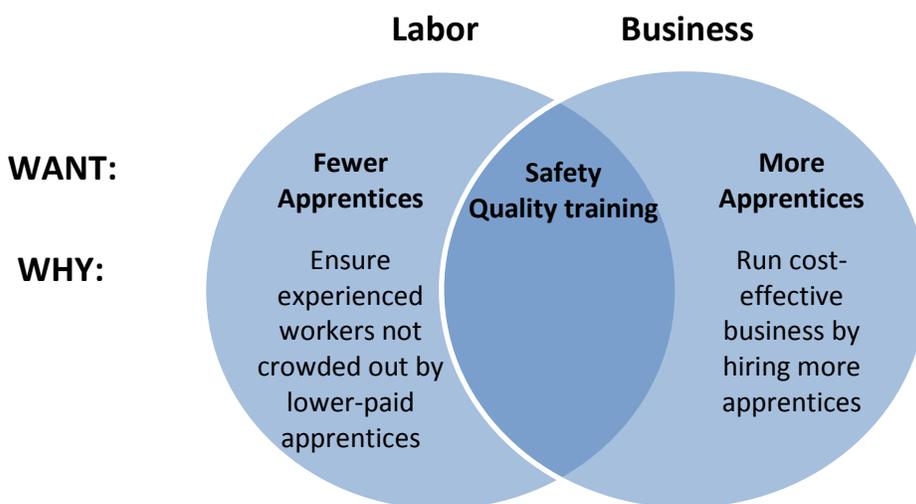
### Hiring Ratio (Company-Based)

Connecticut’s company-based ratio, called a hiring ratio, is more complex than its job site ratio. The hiring ratio schedule is part of the Department of Consumer Protection Occupational Licensing regulations. The schedule took effect in 2011 after being mandated by Public Act 10-27.<sup>1</sup> The law specifies that the ratios apply to the electrical, plumbing, heating, piping and cooling, sprinkler fitter, and sheet metal worker occupations, but CT DOL has adopted the schedule for all apprentice occupations. This schedule relaxed requirements by allowing a company to have more apprentices for the same number of journeymen, compared to the ratios previously in effect.

The current ratio schedule is one apprentice to one journeyman, for the first two apprentices (i.e., 2:2), 3:5 once there are three apprentices, 4:8 at four apprentices, and gradually rising to one apprentice for every three journeymen once there are 11 apprentices. The entire schedule is found in Appendix G.

The hiring ratio seems to be contentious in many of the states that have one, based on PRI committee staff discussions with stakeholders in Connecticut and nearby states. Labor unions tend to prefer relatively fewer apprentices to each journeyman, while business owners and their associations tend to want more apprentices allowed for each journeyman. Figure 2-2 shows hiring ratio concerns from labor and business perspectives. In addition to the concerns listed below, business owners in specific regions (e.g., Fairfield County) and industries (mainly smaller licensed trades) said that they would like the ratios changed because they are unable to find or attract enough journeymen to meet the ratios. Thus, they either hire workers and do not register them as apprentices, or lose business or revenue.

**Figure 2-2: Hiring Ratio Concerns**



Source: PRI staff.

<sup>1</sup> C.G.S. Sec. 20-332b

## **Hiring Ratios (Company-Based) in Other States**

The hiring ratios vary among the nearby states examined for this study. Massachusetts, New Jersey, and New York's hiring ratios vary by trade and differ from each other. Massachusetts's and New Jersey's ratios are the same no matter how many apprentices there are; consequently, it is complex to compare them to Connecticut's ratios.

Massachusetts's ratios are less restrictive for a few occupations (i.e., requiring fewer journeypersons than Connecticut to hire apprentices), such as electrician (2:3), and more restrictive for others (e.g., 1:5 for plumber). New Jersey overall has more restrictive ratios when there are few apprentices (e.g., 1:3 for electrician) and, for some occupations, even when there are many apprentices (e.g., 1:4 for plumber). New York's ratio for a single apprentice is 1:1, and then for most occupations, the ratios are more restrictive than Connecticut's when there are few apprentices but more than one (e.g., 2:4 for plumbers and 2:5 for electricians).

Rhode Island does not differentiate between occupations, and has only job site ratios. It has one ratio for residential work, and two ratio schedules for commercial work – one each for licensed and unlicensed trades. Appendix H displays the ratios for nearby states.

## **Current Discussions**

Connecticut's hiring ratio is being examined now by an informal working group with representatives from the General Assembly, labor, and businesses. The group's work began in mid-October, with the second meeting scheduled for late November. Consequently, the program review committee is not making a recommendation in this area.

## **Hiring Ratio Relief**

The Connecticut labor department has chosen to offer companies the ability to apply for "ratio relief," i.e., an exception to the hiring ratio. Relief is intended to allow companies that cannot find enough journeypersons to hire more apprentices than they otherwise could. Factors that CT DOL can use to determine whether a company's ratio is sufficient are listed in department regulations.<sup>2</sup> The ratio relief application form is available on the CT DOL website.<sup>3</sup> It asks companies to provide information on:

- journey person recruitment efforts;
- company age;
- any recent violations of state or federal laws;
- current status of apprentice and journey person workforce, as well as recent history (e.g., apprenticeship completions, reasons for terminations); and
- explanation of the reason ratio relief is being sought.

The Connecticut apprenticeship office director determines whether to grant ratio relief. The decision is based on much of the information requested in the form, according to interviews with CT DOL staff. The staff stated that key aspects for an approval are that the apprentice

---

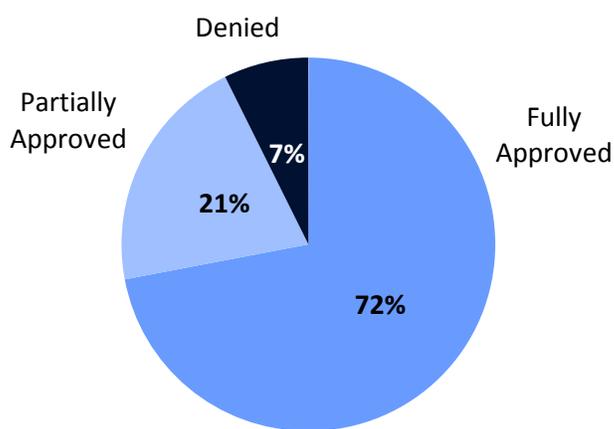
<sup>2</sup> Regs. Conn. State Agencies Sec. 31-51d-5(i) (1980)

<sup>3</sup> <https://www.ctdol.state.ct.us/progsupt/appren/ratio-relief.pdf>

completion and journey person departure rates are not unusual (neither exceptionally low or high, respectively), and for larger companies, that there are at least two journey persons for every apprentice (instead of three for every apprentice, once there are 11 apprentices).

Relief is, in fact, frequently granted by CT DOL. Figure 2-3 shows that from calendar year 2010 through 2014, most (72 percent) of the 382 ratio relief applications were fully approved, according to data provided by CT DOL. Another 21 percent were partially approved, meaning the company could take on additional apprentices but not as many it requested. Only a small share – about one in 14 applications – was completely denied.

**Figure 2-3: Ratio Relief Decisions, CYs 2010-14**



Source: PRI staff analysis of CT DOL data.

About half (52 percent) of ratio relief requests were asking permission to hire just one additional apprentice. These requests were granted at a high rate, 91 percent across the five calendar years. The approval rate for those requests has risen recently, from the upper-80 percent range in 2010 through 2012 to 98 and 96 percent in the last two full calendar years. Companies requesting one additional apprentice were given permission to hire 180 apprentices and denied permission to bring on 18 apprentices, in total.

Representatives of companies and their associations told PRI committee staff during this study that the process and application of the regulatory ratio relief criteria are unclear. Consequently, in the view of some, CT DOL relief decisions seemed arbitrary. The study's time constraints and lack of access to state labor department staff did not allow for program review committee staff to review relief applications and the results for consistency.

Consistent ratio relief decisions and transparency in the ratio relief application process would benefit sponsors and could help persuade sponsors to continue apprenticeship participation. Therefore, **the PRI committee recommends:**

**7. The Connecticut Department of Labor should amend its regulations to include the process to be used by sponsors to request apprentice-to-journey person hiring ratio relief. The department also should annually post, on its website, a list identifying the sponsors that have received ratio relief,**

along with the number of apprentices and journeypersons the sponsor was allowed.

## Wages

### How Wages Are Determined

Each sponsor chooses apprentice entry and completion wages, and also sets the wage progression schedule, within the parameters listed in Figure 2-4. A sponsor may opt to pay above the minimum requirements. During the study, representatives from companies, CT DOL, and labor noted that entry-level apprentice wages frequently exceed the minimum standards.

### Figure 2-4: Apprentice Wage Requirements

1. **State Minimum wage:** No apprentice may be paid less than minimum wage.
2. **Wage progression:** The entry-level wage begins at no less than 50 percent of the minimum completion wage.
3. **Completion wage:** The Connecticut apprenticeship office has minimum completion wages that apply to many occupations:
  - A. Construction occupations: From \$18 hourly for a one-year apprenticeship to \$22 hourly for a four-year apprenticeship
  - B. Manufacturing occupations: \$18 hourly
4. **Prevailing wage:** An apprentice who is working on a public project subject to prevailing wage requirements is to be paid the person's appropriate wage progression percentage of the prevailing wage rate.

Source: PRI staff analysis of information from CT DOL as well as applicable state and federal laws.

The state labor department's minimum completion wages are set about every four years. They are due for review, according to CT DOL personnel.

## Livability

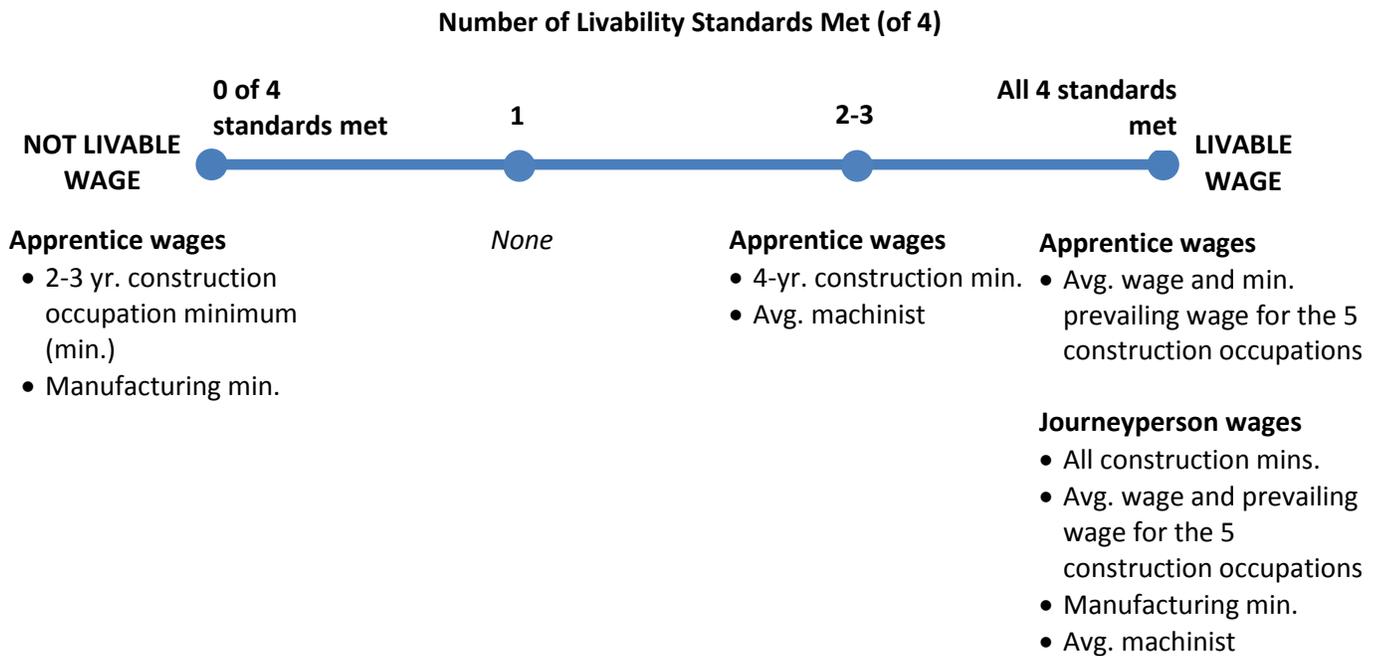
Apprenticeship and journeyman wages generally seem to be livable for single adults but not for apprentices who are the sole earners for their families, as shown in the next two figures (2-5 and 2-6). The figures highlight how many livability standards are met by apprentice and journeyman wages, for apprentices who are single adults (Figure 2-5) and those who are the sole earners for four-person families (Figure 2-6). Apprentice and journeyman wages were examined for six occupations: carpenter, electrician, plumber, roofer, sprinkler fitter, and machinist. Three types of wages were examined for the five construction occupations: CT DOL minimums, averages, and prevailing wages (minimums, for apprentices) – with two types for the

machinist occupation, which lacks a prevailing wage. Each wage was compared to four livability standards:

1. 200 percent of the Federal Poverty Level;
2. the Connecticut United Ways’s ALICE project’s survival standard;
3. the Connecticut United Ways’s ALICE project’s stability standard; and
4. Connecticut’s Self-Sufficiency Standard, a project of the Permanent Commission on the Status of Women.<sup>4</sup>

See Appendix I for more detail on this analysis, including precisely how each wage reviewed compares to the wage standards.

**Figure 2-5: Livability of Six Occupations’ Wages, Including Entry-Level Apprenticeship, Completing Apprenticeship, and Average Journeyman Wages, for a Single Adult**



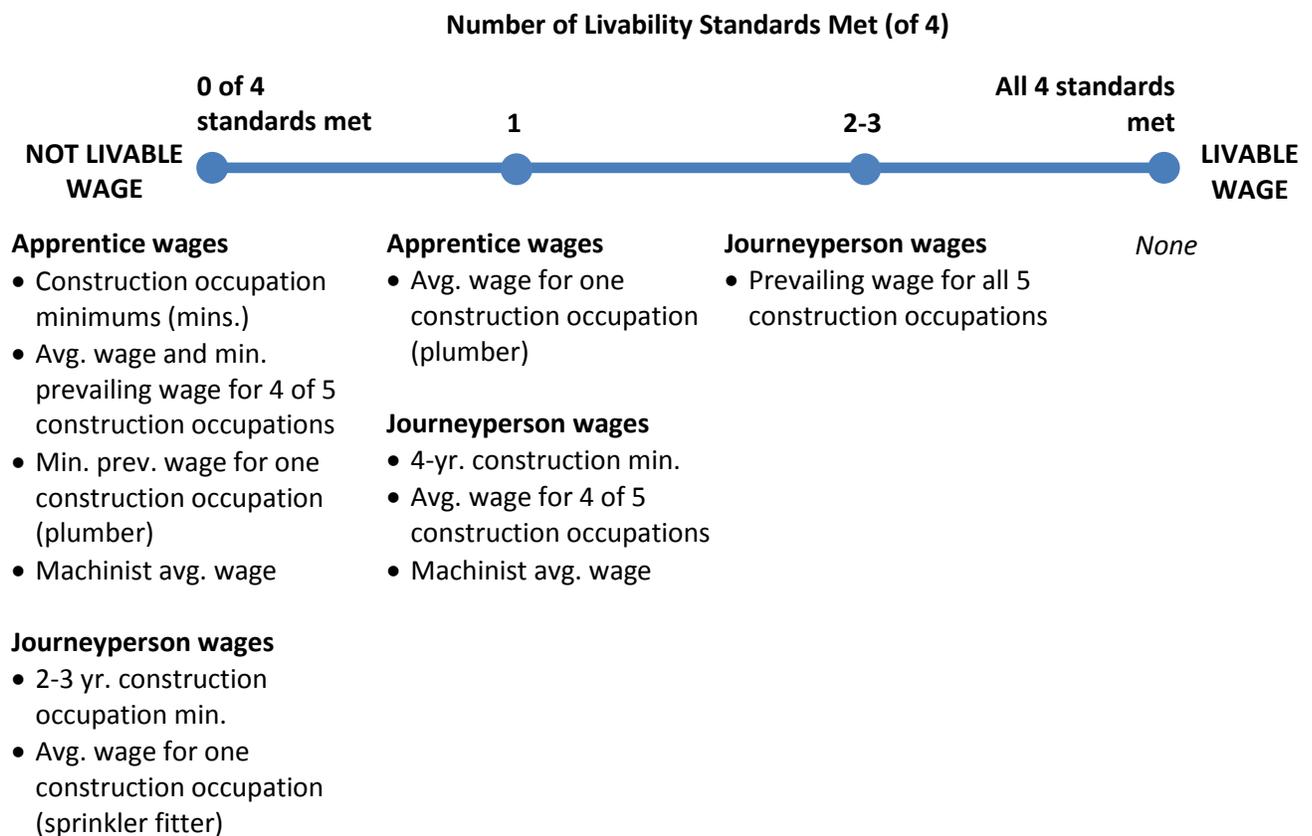
Source: PRI staff analysis of information from: CT DOL for prevailing and average wages, as well as minimum apprenticeship wages; [www.simplyhired.com](http://www.simplyhired.com) for Hartford-area average apprenticeship wage information and average journeyman wages of occupations not included in CT DOL database; and three sources for the four livability standards (U.S. Department of Health and Human Services, Connecticut United Ways, and Connecticut Permanent Commission on the Status of Women). See Appendix I for more information.

<sup>4</sup> The Connecticut United Ways’s ALICE project, published in 2014, is accessible at: [http://alice.ctunitedway.org/files/2014/11/14UW-ALICE-Report\\_CT.pdf](http://alice.ctunitedway.org/files/2014/11/14UW-ALICE-Report_CT.pdf). Connecticut’s Self-Sufficiency Standard was most recently issued in 2015: [http://www.selfsufficiencystandard.org/docs/CT2015\\_SSS.pdf](http://www.selfsufficiencystandard.org/docs/CT2015_SSS.pdf).

Figure 2-5 shows that for single adults, although the entry-level apprentice minimum wages set by CT DOL fall short of some or all of four livability standards, the actual apprentice wages for five of the six occupations examined do not.<sup>5</sup> Journeyman wages met all livability standards, for single adults.

On the other hand, for adults supporting families as single-earners, apprenticeship and journeyman wages might not be livable, as Figure 2-6 indicates.

**Figure 2-6: Livability of Six Occupations’ Wages, Including Entry-Level Apprentice, Completing Apprentice, and Average Journeyman Wages, for An Adult Who Is the Sole Earner for a Four-Person Family**



Source: PRI staff analysis of information from: CT DOL for prevailing and average wages, as well as minimum apprenticeship wages; [www.simplyhired.com](http://www.simplyhired.com) for Hartford-area average apprentice wage information and average journeyman wages of occupations not included in CT DOL database; and three sources for the four livability standards (U.S. Department of Health and Human Services, Connecticut United Ways, and Connecticut Permanent Commission on the Status of Women). See Appendix I for more information.

<sup>5</sup> Wage information came from three sources: CT DOL’s required prevailing wages; the job search and salary engine Simply Hired; and CT DOL’s Occupational Wages and Employment data.

Of the six occupations examined in Figure 2-6, only one had entry-level apprentice wages (average apprentice wages) sufficient to support a four-person family.<sup>6</sup> The entry-level wages for the other five occupations were below 200 percent of the Federal Poverty Level, and those wages fell well short of the three Connecticut-specific livability standards for all six occupations.

Journeyman wages fared better, but the analysis could not determine whether they allow people to single-handedly support families. For all five of the construction occupations examined, average wages were substantially lower (by \$6 to \$19 hourly) than prevailing wages, which are supposed to indicate “going rates.” Four occupations’ average wages exceed the Federal Poverty Level (but not any of the other standards) and average wages for the other two (sprinkler fitter and machinist) were at 93 and 95 percent of the Federal Poverty Level (and therefore were well short of the other three, higher standards). The occupations’ highest average wage – for plumbers, at \$29 hourly – is \$3 to \$9 hourly short of the three standards. If prevailing wages are examined, however, electrician, plumber, and sprinkler fitter meet three of the four livability standards, while carpenter and roofer reach two standards.

---

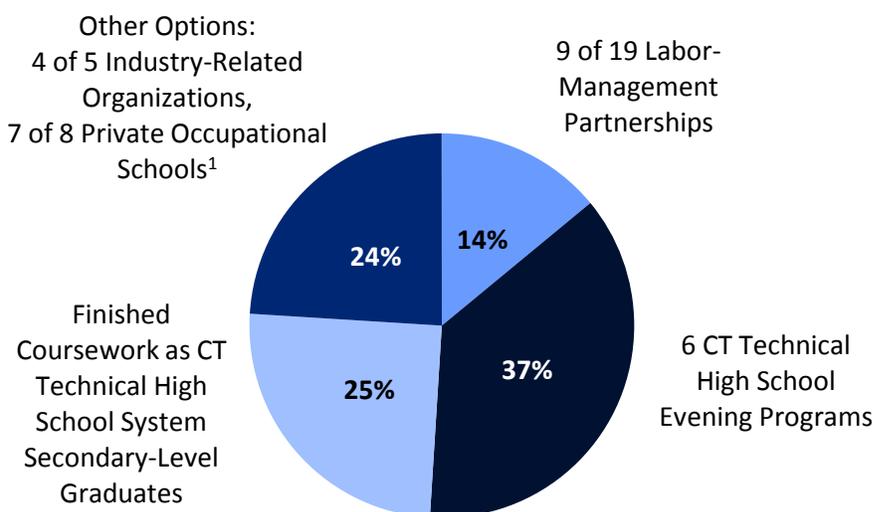
<sup>6</sup> The average plumber apprentice wage was the only apprentice wage to approach a family livability standard, at 95 percent of twice the Federal Poverty Level.

## Coursework

Each apprentice must successfully complete coursework in order to finish an apprenticeship. The number of minimum coursework hours varies among the trades, with about 144 hours for every year of on-the-job training. The Connecticut Department of Labor (CT DOL) reviews and approves educational institutions and other types of organizations as offering sufficient coursework for apprenticeship. Coursework completed at an approved provider is expected to be accepted by all apprenticeship sponsors. Coursework taken at a non-approved provider can be reviewed by the Connecticut State Department of Education (CSDE), which recommends to CT DOL whether to accept all or part of the coursework hours for apprenticeship credit.

There is a wide array of approved coursework providers. As Figure 3-1 shows, as of January 2015, nearly two-thirds (65 percent) of apprentices in licensed occupations were taking or had completed apprenticeship coursework from the Connecticut technical high schools. Most of them (37 percent) were in the schools' evening programs.

**Figure 3-1: Where Apprentices in Licensed Occupations Take Coursework, January 2015**



Note: <sup>1</sup> Some of the approved coursework providers offer coursework only in unlicensed occupations - one each for industry-related and one private occupation schools, and 10 of the labor-management partnerships.

Source: PRI formatting of January 2015 data provided by CSDE. CSDE reported the information originally came from CT DOL.

Another 25 percent had completed the coursework requirement by graduating from a technical high school. Nearly one-quarter (24 percent) were taking or had finished coursework from either industry-supported schools or private occupational schools. Finally, a small share (14 percent) was taking classes through their labor-management partnership sponsor. Appendix J lists all the approved

coursework providers, including the occupations in which each has been approved to deliver apprenticeship coursework (whether licensed or unlicensed).

This chapter addresses three issues related to coursework: accessibility, quality (including an in-process CT DOL review of some providers), and college credit. The information from this chapter largely comes from coursework providers' responses to a program review committee survey and from committee staff interviews with some providers.

## **Accessibility**

During this study, the PRI committee heard a few complaints about limited accessibility of coursework. There are multiple aspects to accessibility, including:

- *Geographical accessibility*, with classes located a reasonable distance from the apprentice's home or employment;
- *Schedule accessibility*, with classes held at times and on days that are feasible for the apprentice;
- *Enrollment accessibility*, with classes that have space for new students and start when students need to begin; and
- *Financial accessibility*, with an immediate or long-term cost which the apprentice views as affordable.

Coursework accessibility varies tremendously depending on which occupation, aspect of accessibility, and category of provider (e.g., labor-management partnership, private occupational school) is considered. A provider category might be strong in one aspect of accessibility, such as financial, but weak in another, like enrollment.

Although there is room for improvement in coursework accessibility, it is unclear what should be done, if anything. The State Apprenticeship Council could consider how to improve coursework accessibility. For example, the council could provide CT DOL with advisory guidelines on what coursework is appropriate for apprentices in the 11 occupations that appear to lack an approved related instruction provider.<sup>1</sup>

### **Geographical Accessibility**

There is a perception that geographical accessibility has declined, probably due to the drop in Connecticut Technical High School System offerings. The system used to deliver apprenticeship coursework (in the evenings to adults, versus in its daytime secondary school program) in 18 licensed trades at 14 of the 17 schools. Around the 2008-09 academic year, however, budget woes led the system to cut the coursework at several schools. Although the six schools that continue to offer apprenticeship coursework are relatively distributed throughout the

---

<sup>1</sup> The nine occupations with fewer than ten apprentices but possibly no approved coursework provider (based on coursework provider survey responses) are: industrial/maintenance electrician, industrial/maintenance heating and cooling mechanic, cable splicer (L-2), electrical draftsman, well driller (W-2), accessibility journey person which is related to elevators and lifts (R-6), nuclear reactor operator, senior reactor operator-in-training, and firefighter. The two occupations with more than ten apprentices but possibly no approved coursework provider are: auto glazier (AG-2) and fire suppression systems technician (F-4).

state, clearly it takes some people more time to reach the technical high school programs than it would have before the reductions.

At the same time, technological advances and the spread of internet access could make coursework more accessible. CT DOL has approved two online-only coursework providers, which theoretically makes coursework available (for the approved occupations) to any Connecticut apprentice with computer access.

Finally, many of the occupations with relatively few apprentices have just one or two approved providers, which naturally means that everyone outside the providers' immediate areas will have to travel – and overall, have limited options. For the most part, the providers in these occupations are labor-management partnerships that are located near the center of the state (e.g., Berlin, Wallingford, Rocky Hill). Similarly, open-shop industry-related providers – generally one per occupation, for those with relatively more apprentices – are also centrally located for easier access.

### **Schedule Accessibility**

Schedule accessibility was not examined in depth by this study, due to time constraints. Generally:

- A few complaints were heard that it can be difficult for apprentices working full-time in an apprentice occupation – often at job sites far from home – to travel to and learn from weeknight classes, as the technical high school system evening programs require;
- Several, if not most, labor-management partnerships offer coursework in 40-hour week-long blocks, multiple times a year; and
- Private occupational schools overall offer coursework both in full-time daytime programs and in evening or weekend programs, depending on the provider.

### **Enrollment Accessibility**

Enrollment accessibility seems to vary depending on the type of coursework provider. The labor-management partnerships tend to have many more applicants than they want to accept (given employers' current need for labor) – even though they are enrolling many more apprentices now than in recent years. Consequently, some have multiple steps in the application and selection process. The process can involve submitting an application in person, a math and/or basic skills test, and, frequently, an interview.

Enrollment is more accessible at industry-related and private occupational schools. These schools seem to have apprenticeship coursework enrollment at about 50 percent of capacity, overall, from the schools that responded to the survey. People seem to enroll at private occupational schools when they have not yet obtained apprenticeships. Among the private occupational schools that responded to the survey, approved coursework programs had few apprentices among the students (estimated to be from zero to 30 percent, depending on the program and school).

Whether enrollment is accessible at the technical high school system may depend on the school, occupation, and precise year. Two of the six apprenticeship program schools, A.I. Prince in Hartford and Bristol TEC, seem nearly full, at 97 percent and 89 percent of capacity, respectively. However, accessibility may vary within the different occupational areas (e.g., electrical) at those and the other technical high schools. Furthermore, not every class is offered each semester. The system attempts to provide the classes its apprentice students need to stay on track, but the committee heard that does not always happen.

### **Financial Accessibility**

Financial accessibility also seems to differ tremendously among coursework providers. The total price of coursework tends to be lowest at the labor-management partnerships. The partnerships' total cost to the apprentice ranges from nothing to \$2,500 (one electrician partnership, which is more than double the second most costly partnership's price), with a median cost of \$695.<sup>2</sup>

The industry-affiliated schools for which information was available, as well as the technical high schools, offer the next-lowest prices, from between \$2,350 and \$7,600. Financial aid generally is not available for apprentice students in these programs (or students in labor-management partnerships).

Bricks-and-mortar private occupational schools have the highest sticker prices, based on survey responses. (No information on online-only coursework providers was available.) The prices ranged from \$18,425 to \$27,420. Although the sticker price is high, financial aid is available. Among students who took out loans, the median average student loan amount for electrician (E-2) coursework was \$11,585, collectively for the four responding private occupational schools.

**Value.** The sticker price of coursework does not convey any information about coursework quality, volume, or likelihood of completion. A coursework program that has a relatively low sticker price but offers inferior instruction, or a low likelihood of completion, might not be a bargain.

Table 3-1 shows the variation among coursework providers for the electrician (E-2) apprenticeship, the occupation with the most apprentices. The chart shows that the coursework offerings vary tremendously. The information was self-reported by coursework providers that responded to a program review committee survey.

### **Quality**

As described in the chapter's introduction, an organization offering classes in apprentice occupations can apply to be approved by CT DOL as an apprenticeship coursework provider. The approval process involves curriculum review and evaluation of the program in other ways by CT DOL and the Connecticut State Department of Education. The purpose of the approval process is to ensure the program provides adequate instruction in the occupation, so all completing apprentices share a foundation of critical knowledge.

---

<sup>2</sup> The partnership schools are funded in whole or part by levies on union-contracted employers.

The CT DOL apprenticeship office has not consistently reviewed approved providers' coursework quality, after approval has been granted. Some providers were approved many years ago, and it is reasonable to expect there may have been advances in technology or instruction – or simply changes in instructors – that could have substantially altered the coursework. Apprenticeship office managers told PRI committee staff that resources have not allowed the office to monitor coursework quality.

**Table 3-1: Electrician (E-2) Apprenticeship Coursework, by Type of Provider, According to Provider Survey Responses**

Survey Respondents	Towns	Coursework Hours (Range)	Completion Rate	Academic Credit Available	Cost to Apprentice (Range)
CT Technical High Schools: 6	Bridgeport Bristol Danbury Hamden Hartford Norwich	720	Unavailable	---	\$3,000, or \$7,000 if not active apprentice
Industry-related: 1	Rocky Hill	720	98%	40 hrs. from American Council on Education (ACE)	\$2,350
Labor-management partnerships: 3	Hartford Monroe Wallingford	900-1,100	33-85%	At 2: 60-62 hrs. from ACE <sup>1</sup>	\$650-\$2,500
Private occupational schools: 4	Branford Enfield N. Britain Shelton Waterbury	720-900	70-89%	At 1 or 3 <sup>2</sup>	\$18,425-\$27,420

Notes:

<sup>1</sup>The partnership with the lowest price does not offer academic credit.

<sup>2</sup>One school makes available either 40 credits from an Arizona community college, or nine from a local university. Two other private occupational schools replied that they give about 75 quarter-hours of credit from their schools.

Source: PRI staff analysis of apprenticeship coursework provider survey responses.

### In-Process Quality Review

In early 2015, the CT DOL apprenticeship office and CSDE began to examine some approved providers' coursework. The evaluation was limited to most of the private occupational schools because graduates' complaints to CT DOL about coursework quality at one or more of those providers had prompted the review. Industry-related schools were also included. Online-only private occupational schools, the community colleges, and Goodwin College were

exempted because they had been recently approved or were in the process of approval review. It is unclear whether the labor-management partnerships' coursework was examined; conflicting information was received. The review was restricted to the coursework for the electrical, plumbing, heating and cooling, and sheet metal licensure categories.

The review process began with CT DOL and CSDE requesting the approved providers submit curricula materials. The materials were compared to the Connecticut Technical High School System apprenticeship curricula for the same occupations. At some point in the process, CT DOL also hired a consultant (a CSDE retiree) to continue with the review, together with the CSDE employee who was involved in the review. If an approved provider's curricula did not match the technical schools', the provider was asked to complete an in-depth "crosswalk" to show how the topics and minutes spent on them aligned with the technical school classes. It is unclear to the program review committee why the technical high schools' apprenticeship curricula were selected as the comparison standard.

As of early December 2015, most of the reviewed private occupational schools and all but one industry-related provider have been found deficient (i.e., approval still pending) for at least one occupation's program. The providers have been notified that if their courses are not adjusted by January 1, 2016, approval is withdrawn. Labor department personnel have said that students nearing the end of a coursework program with a deficient provider would be given full credit. Other students who continue on with the coursework would receive partial credit, for those courses that aligned with the technical high school curricula. Labor department staff also noted that deficient providers would no longer be included on a website listing of approved coursework providers – a listing that this study discovered has multiple errors and is incomplete (see Chapter 1).

The review process has been rife with problems, from the view of the examined providers and the PRI committee. Multiple reviewed providers have stated that the process is deeply flawed because, in their view:

1. The review standards are inappropriate to the trade or out-of-date, or they do not match the current licensing exam questions, in at least a few cases;
2. The documents used for the evaluation (the crosswalks) are so detailed that they are meaningless and have required tremendous provider staff time to complete;
3. The process and what needed to be shared have not been clearly explained, a problem worsened by a lack of availability of the consultant retained by CT DOL to handle the evaluation because his working hours are limited, per his agreement with CT DOL; and
4. Programs have been deemed deficient despite strong or comparable licensure exam pass rates, which could be considered a measure of whether the coursework is sufficient.

These complaints have come from providers in both the industry-related and private occupational school categories. All of the providers that approached program review committee

staff noted that they used curriculum approved and routinely updated (e.g., every three years) by general or occupation-specific building industry associations at the national level.

The PRI committee believes many of the complaints have merit. The committee staff analysis of licensure exam pass rates for three trades with many apprentices, and two with few, showed that:

- There were no statistically significant differences in the exam pass rates, among the types of coursework providers;
- Although not different from the overall pass rate in a statistically significant way, the technical high school system had the lowest pass rate of the four types of coursework providers, when the results from the five occupations' exams were aggregated, due mainly to the weaker performance of its graduates on the electrician exam; and
- A few of the providers found deficient had very strong pass rates in the exam(s) reviewed.

The analysis (detailed in Appendix K) should be interpreted with some caution but, even with appropriate caution, the findings suggest that perhaps the provider evaluation standard (the technical high schools' apprenticeship curricula) be reconsidered and licensure exam performance be given a role in the review.

Furthermore, the program review committee is concerned that if formerly approved providers are unable to adjust curricula in time, as seems likely, the still-approved coursework options will be extremely limited. If coursework accessibility is severely constrained, a large number of apprentices will be unable to complete their apprenticeships (and therefore, move up to better-paying positions) in a timely way. That could negatively impact both apprentices and sponsors (i.e., employers and labor-management partnerships).

Additional features detract from the process's integrity:

- The labor-management partnerships might have been excluded from the review, despite the fact that many, if not all, were approved decades ago, and coursework provider survey responses indicated five partnerships (offering training in eight occupations) are not meeting an apprenticeship "hours" requirement (in coursework or on-the-job training);
- Only one or two persons have been making the decisions on the standards used and on the evaluation findings, without any review by others (e.g., licensed individuals, licensure boards); and
- There is no ability to appeal to an impartial person, for providers found deficient.

Although the goal of ensuring apprenticeship coursework quality is laudable and worthwhile, this particular effort is not reaching that goal. There is a need for coursework

standards, on some level, but a review that relies on what may be an inadequate standard, involves a complicated evaluation framework, disregards important quality indicators, and is messily executed (at best) should not proceed.

The in-process review could cause undue harm to apprentices, coursework providers, and apprenticeship sponsors, particularly if it continues. Yet, coursework standards are needed. Therefore, **the PRI committee recommends:**

**8. The Connecticut Department of Labor should immediately suspend its evaluation of apprenticeship coursework providers and notify them of the suspension. The department should then take the following steps to develop and implement apprenticeship coursework standards:**

- a) **Give administrative and technical assistance to the licensing boards, each of which should propose coursework standards for every license under its jurisdiction by July 1, 2017. The coursework standards should reflect current practices and knowledge needed for each occupation, including knowledge tested on occupational licensing exams. As part of the standards proposal, the licensing board also should determine whether any curriculum developed by a national industry association or a national accrediting body is acceptable in lieu of the coursework standards. In formulating each proposal, the licensing boards should seek comments and suggestions from all coursework providers who had been previously approved by the labor department as apprenticeship coursework providers.**
- b) **Deliver the licensing board proposals to the State Apprenticeship Council for the council's review and suggested revisions, by August 1, 2017. The council should examine the proposals, receive public comment on them, and give suggested revisions to the labor department by December 1, 2017.**
- c) **Determine the coursework standards and publish them on the labor department's website by December 31, 2017.**
- d) **Use the new standards to evaluate organizations that apply to become new coursework providers, or approved coursework providers that apply for approval to offer coursework in an occupation for which approval was not originally granted.**
- e) **Set a schedule and clear process for reviewing approved coursework provider quality on a routine basis, by December 31, 2017.**
- f) **Set a schedule for regularly updating the coursework standards at least every five years. The update process should be the same as the process outlined above for developing the standards.**

## Academic Credit Availability

College-level academic credit can be made available to apprentices who successfully finish apprenticeship coursework requirements. College credit can be used to advance to a managerial position, or to transition into a different occupation that requires a college degree. A journey person (i.e., experienced worker) may attempt a career transition upon becoming disabled or encountering economic challenges, which can be substantial during recessions or low-growth periods.

College credit can be given to an apprentice when a coursework provider's curriculum has been assessed by a college or national organization that specializes in curriculum evaluation. An apprentice who has completed the coursework may request the credit from the college or national organization at any point in the future.

In Connecticut, at least nine labor-management partnerships, one of the industry-affiliated schools, and one of the private occupational schools offer college credit to apprentices who complete their coursework. (See the occupation-based charts in Appendix L for more information.) Eight labor-management partnerships do not offer credit, including:

- One of the three partnerships for electricians;
- One of two for sheet metal workers; and
- One of two for iron workers.<sup>3</sup>

College credit may also be offered to all journeypersons who hold a particular license. For example, persons who were licensed electricians (E-2) between 2003 and 2013 can request 24 credits from Connecticut's Charter Oak State College.

The U.S. Department of Education is leading a national effort to expand the number of apprenticeship coursework programs for which college credit can be awarded, but there has not been much movement in Connecticut. There have been a few discussions but no resolution between the CT DOL apprenticeship office and Charter Oak State College on how the effort could be advanced in Connecticut. For example, the college could reach out to the labor-management partnerships that do not currently offer college credit, to see if the program is interested in a credit evaluation.

While the concept of making college credit available to a greater number of apprentices or licensees seems attractive, it is unclear whether the resources needed to do so justify the likely return. For example, the carpenter labor-management partnership has been offering credit through Charter Oak for many years, but only one person seems to have ever requested the credit. It is unclear whether the partnership and its member union have publicized the credit availability among their apprentices and journeypersons; perhaps more people would have used it if they had known about it. The cost of a credit evaluation ranges from \$4,000 to \$6,000, and then an individual requesting credit be transferred to a different college must pay up to \$400.

---

<sup>3</sup> Information was unavailable for three partnerships: insulator, elevator constructor, and sprinkler fitter.

Making college credit available to even more people through giving credit to all licensed persons for particular occupations could result in a higher level of use. Publicizing availability would be relatively simple and it makes conceptual sense, if the coursework providers are all preparing their students for the same exam and skills. Therefore, **the program review committee recommends:**

**9. The Connecticut Department of Labor, Charter Oak State College, the Department of Consumer Protection, and the licensing boards should discuss what resources would be needed to undergo an assessment that could result in making academic credit available to license holders in apprentice occupations. The groups should then consider whether to move forward with assessment(s).**

---

# Interagency Coordination

The Departments of Labor and Consumer Protection are both involved in preparing and credentialing the workforce for certain occupations, as well as in ensuring employers follow labor-related laws. Although the departments communicate frequently on an as-needed basis, there are a few areas in which coordination could be strengthened or clarified.

## Occupational Training Registered with DCP

The Department of Consumer Protection (DCP), with the assistance of occupational boards, oversees worker training for 20 licensed occupations that do not have apprenticeships but require similar coursework and on-the-job training. Called “trainee occupations,” they generally are highly specific, such as a limited hoists, cranes, and lifts journeyperson (R-10), and the training is for a specified amount of time, as in registered apprenticeship. (See Appendix M for the complete trainee occupation list.) Someone who wishes to learn a trainee occupation must request DCP registration via a form available on the DCP website; unregistered (that is, non-licensed) working in the occupation is not allowed. Unlike with apprenticeships, there is no employer or sponsor approval process, although the registration form requires any employer involved to submit an employee list so DCP may ensure the company has at least as many employees as trainees. Trainee registration also requires an explanation of what related instruction and on-the-job experience will be involved. As of August 2015, there were 215 DCP trainees.

The DCP training system arose over the last 20 years or so. As the legislature created more licensure types, including several “limited” licenses, nobody who might be a sponsor requested that CT DOL create corresponding apprentice programs. Because state law requires workers in licensed trade-type occupations be licensed or registered with a state agency, wherever a licensed occupation did not have apprenticeships, DCP stepped in with the trainee program.

Several years ago, DCP approached CT DOL and requested some or all of the trainee occupations become apprenticeship occupations, but very little change resulted. A State Apprenticeship Council subcommittee reviewed the occupations and advised CT DOL that only one or a few convert to an apprenticeship.<sup>1</sup> The labor department accepted the council subcommittee’s recommendations. The subcommittee and CT DOL concluded that most of the trainee occupations were not full, recognized trades, despite being licensed occupations. Therefore, according to CT DOL staff, the occupations did not merit the benefits of registered apprenticeship and recognizing those occupations as apprenticeships could be detrimental to the apprenticeship system.

Most of the DCP trainee occupations seem to meet the requirements for apprenticeable occupations. Twelve of the 18 occupations with set training lengths require at least one year of

---

<sup>1</sup> The only occupation CT DOL could recall being moved was a two-year residential sheet metal occupation (SM-4).

on-the-job experience and they appear to meet the other criteria as well (e.g., involve the acquisition of manual or technical skills and knowledge).

The current bifurcated system for training people in licensed occupations has multiple problems, including:

- Employers and potential trainees could be confused about which agency handles training, leading some to perhaps invest needless effort in understanding what needs to be done or even to bypass registration altogether – DCP staff told program review committee staff they receive calls from confused potential trainees / apprentices;
- Employers are held to different standards (e.g., company “hiring ratios,” fees, wage progression) for the CT DOL apprenticeship and DCP trainee programs, which could be considered unfair; and
- DCP trainee registration forms and trainee requirements are not easily accessible on the DCP website, unlike CT DOL apprenticeship information for some occupations.

Because CT DOL is the primary department overseeing workforce development activities in the state, **the program review committee recommends:**

**10. The Connecticut Department of Labor should offer apprenticeships in all licensed trainee occupations that meet the minimum on-the-job training and coursework requirements for apprenticeships, by July 1, 2017. The department should conduct outreach to encourage employers to become sponsors in those occupations.**

**The labor department should consider handling all trainee registration and related matters for licensed occupations that require training but do not meet the requirements of registered apprenticeship. The department should consider a standalone, minimally-staffed trainee office that coordinates closely with the apprenticeship office.**

If CT DOL declines to establish an office for trainee registration, **the program review committee further recommends:**

**11. The Department of Consumer Protection should revise its website so that each trainee occupation or trainee occupational field’s webpage links to the trainee registration application and to clear standards for the specific trainee program.**

## **Data on Occupational Exam Results and Licensure Status**

The Department of Consumer Protection has two types of outcome information related to apprentice training that could provide CT DOL with valuable insight into that training. Those

insights could be utilized to improve apprenticeship so it is as useful as possible for apprentices and the state's economy.

First, licensure exam results are available from DCP separately for each apprenticeship coursework provider. Although the exam data should be interpreted with caution (as explained in Chapter 3), it could help CT DOL understand which coursework providers are excelling or falling short. The labor department could then work to develop coursework best practices, sharing lessons with those providers whose licensure rates lag. Labor department staff gave conflicting information during the study about whether they review the exam results by coursework provider; the program review committee does not believe such a review is done routinely, if ever.

Second, the rate at which new apprentices eventually become licensed, and how long licensure takes, could be tracked manually by CT DOL using DCP data. Licensure rates and completion timeframes could be examined by occupation and sponsor, to help the labor department identify and work to solve potential performance problems.

**Therefore, the program review committee recommends:**

**12. Every few years, the Connecticut Department of Labor should examine occupational exam results by apprenticeship coursework provider and licensure data by occupation and sponsor. The resulting information should be used to assist coursework providers and sponsors in improving the quality of apprentice training.**

## **Enforcement**

The Department of Consumer Protection, Trade Practices Division investigates and takes enforcement action against employers who do not follow employee occupational licensure requirements. For licensed trades with apprenticeships or trainee programs, an employee must be either licensed or a registered apprentice (or trainee) who is being directly supervised, at a minimum, by at least one journeyman. According to the department, when these requirements are violated and detected, DCP fines the employer, not the individual working for the company.

During the committee's October public hearing, testimony was provided on two types of problems with companies employing workers who should be registered as apprentices but are not:

1. An employer is a sponsor with one or more registered apprentices, and then fails to either register additional entry-level workers as apprentices or to annually renew registration; and
2. An employer that was never a CT DOL approved sponsor hires entry-level workers who have never been registered as apprentices with DOL.

The use of unlicensed workers who should be registered as apprentices but are not, raises safety concerns because the employer is not necessarily training or supervising the entry-level person appropriately. Furthermore, these workers often earn lower wages than they would as

apprentices, and they do not receive any hourly credit because they were not registered. It should be noted that the trade practices division's staffing level has fluctuated over the last ten years, with attrition to a low of one supervisor and one inspector in 2010-2013 to one supervisor and three inspectors as of October 2015, so there are limited staff resources to conduct wide-ranging enforcement activity.

### **Window for Apprentice Registration**

Federal regulation gives approved sponsors 45 days from hiring to register a person as an apprentice.<sup>2</sup> The program review committee believes that following the federal regulation and amending the Connecticut statute would allow existing sponsors the opportunity to hire new apprentices more quickly and see if the person is capable before they take them on as a full employee. Therefore, **the PRI committee recommends:**

**13. The Connecticut Department of Labor should clarify how long sponsors have to register a new employee as an apprentice and should consider the 45-day window that is allowed under federal regulation.**

### **Enforcement Activities**

Based on three years of closed complaint data (FYs 13-15) provided by the DCP Trade Practices Division, there were:

- 28 “unregistered apprentice” violations – contractor fines equaled \$35,750; and
- 14 “allowing an apprentice to work before registering” violations – contractor fines totaled \$12,250.

According to the division, there were other violations involving apprentices but they were part of broader categories (i.e., unlicensed and billing complaints) and therefore could not be exclusively assigned to complaints about apprentices.

Some of the organizations and individuals providing testimony at the study's public hearing in October suggested the function of occupational licensure enforcement with respect to apprentices be transferred from DCP to CT DOL. The rationale is that CT DOL also performs worksite enforcement activities related to laws on minimum wage, overtime, wage payment, prevailing wage, and employment of minors.

Although PRI acknowledges there may be some overlap in enforcement activities between the two agencies, the committee is not recommending this function be transferred. The functions of each agency and applicable laws would need a more thorough review before such a recommendation could be made. Furthermore, both agencies' resistance to the idea of transfer was strong, which casts doubt on whether transfer would be carried out effectively.

---

<sup>2</sup> 29 CFR 29.3(d)

## **Sharing Information**

Even if the enforcement system stays the same, the program review committee believes DCP and CT DOL should be aware of actions taken against employers by either department. DCP is already statutorily required to submit complaints “concerning unauthorized work and practice by persons not licensed, registered or certified by such boards or commissions to distribute a monthly list to the chairperson of the appropriate board or commission and after investigation, a list of those that were dismissed.”<sup>3</sup> Since this is already being done, it would be easy for DCP to forward the information to CT DOL so that both departments are aware of situations that might involve workers who should be registered apprentices. It does not seem that such forwarding regularly happens, based on separate interviews with staff from the involved agencies. Therefore, **the PRI committee recommends:**

### **14. The Connecticut Department of Labor and the Department of Consumer Protection should take the following steps regarding occupational licensure enforcement:**

- a) **Any enforcement action taken by the Department of Consumer Protection against an employer involving the use of employees performing work that requires apprentice registration or occupational licensure should be forwarded to the Connecticut Department of Labor apprenticeship office on a monthly basis.**
- b) **The apprenticeship office should check its data system to determine if the worker was ever registered as an apprentice and/or if the employer was ever an approved sponsor. If so, the office should contact the sponsor to determine the reason(s) the sponsor did not register the employee as an apprentice. If the worker was ever registered as an apprentice, the apprentice should be mailed a reminder notice that he or she is not considered a registered apprentice and therefore will not receive credit towards apprenticeship completion until registered.**
- c) **In addition, the state labor department, Wage and Workplace Standards Division should send a monthly report to DCP and the apprenticeship office delineating any violations that division has identified and found valid for those transgressions that involve workers without proper credentials.**

---

<sup>3</sup> C.G.S. Sec. 21a-8(8)



---

### Alignment Update

As part of this study's focus on workforce supply, the balance between Connecticut job openings and the number of in-state college graduates was examined for selected occupations. The assessment consisted of updating the "supply and demand" analysis found in the program review committee's 2009 report *Alignment of Postsecondary Education and Employment*, to reflect the most recent data available. That analysis, like the one here, was limited to occupations that are very closely tied to a specific postsecondary degree or certificate.

This chapter gives an overview of how the number of recent graduates compares to the number of projected job openings for occupations in health care and other fields. Detailed information on the numbers of graduates overall and by school, as well as for projected job openings, is provided in Appendix N for health occupations and Appendix O for other occupations. Similar information for educator positions may be found in Appendix P, as it was not available at the time the committee approved the report.

**Caveats.** When reviewing the information presented below, there are two important caveats to keep in mind. First, the job openings data are projections (issued by the Connecticut labor department), not actual openings. The number of actual openings in any given year might not match – or even approximate – the number projected. Indeed, this committee's 2009 *Alignment...* report found that the ability to forecast job openings 10 years out is limited, with some projections off by a substantial amount (similar to federal labor department projections). Furthermore, the occupational openings projections take into account positions at all experience levels; they are not limited to entry-level positions for which recent graduates are probably best-qualified.

Second, the number of Connecticut graduates in the particular year examined should not be taken to indicate total supply. Connecticut graduates may choose to select a position in another location, or in another occupation – or opt to pursue further education. Similarly, recent graduates or experienced workers from other states or countries may choose to come to Connecticut for work.

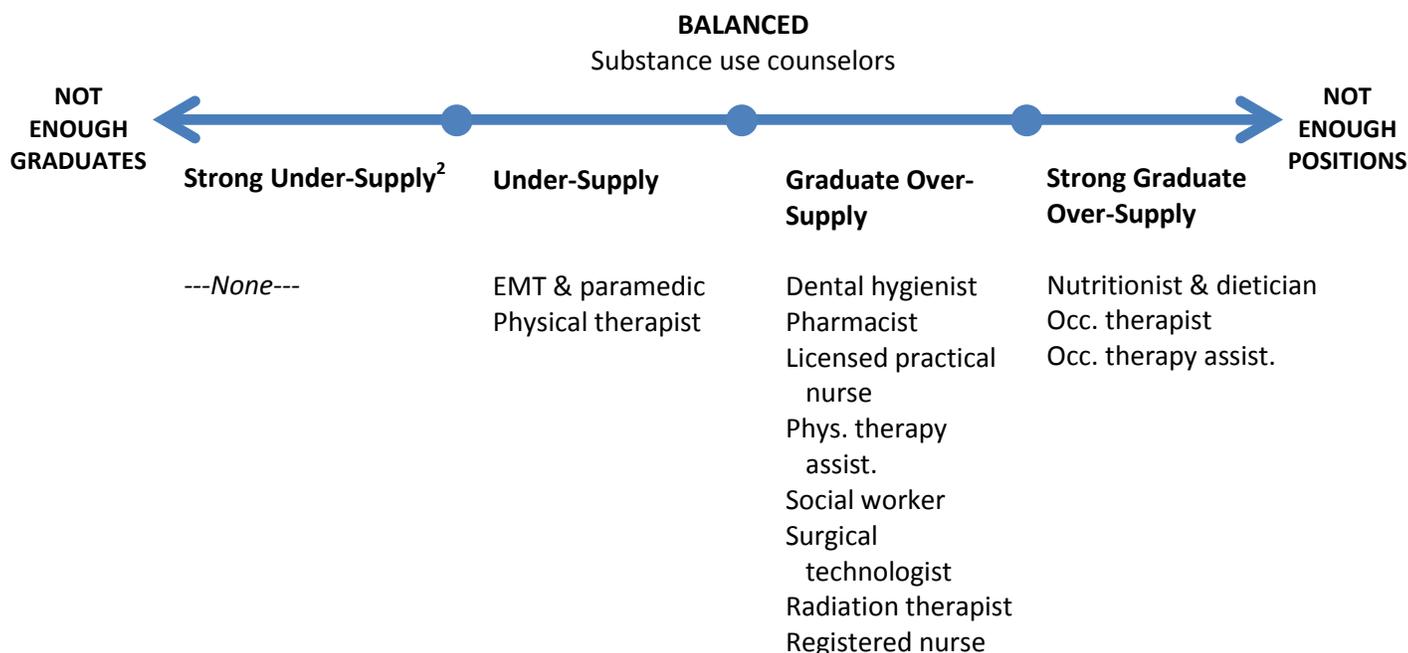
### Health Care Occupations

Figure 5-1 shows that most of the health care occupations (11 of 14) examined seemed to have an over-supply of graduates in the 2013-14 academic year. Eight of the 14 occupations have 10 to 50 percent more graduates than projected openings. Another three occupations – nutritionist/dietician, occupational therapist, and occupational therapy assistant – have a strong over-supply, beyond 50 percent more graduates.

The figure indicates that just one occupation, substance use counselor, has about as many graduates as there are projected openings.

Two health care occupations had fewer Connecticut graduates than projected job openings, but none had a strong under-supply.

**Figure 5-1. Healthcare Occupations’ Balance of Graduates and Projected Job Openings, 2013-14 Academic Year<sup>1</sup>**



Notes:

<sup>1</sup>The 2009 PRI report on this topic also included veterinarian, an occupation that requires a doctoral degree unavailable in Connecticut, and veterinary technologist and technician, an occupation that does not require postsecondary education (though options are available). This analysis excludes both occupations.

<sup>2</sup>“Strong” indicates the supply was unbalanced by more than 50% (i.e., for a strong over-supply, the number of graduates exceeded the number of open positions by at least 50%). “Under-Supply” or “Over-Supply” mean the supply was unbalanced by 11 to 50% (i.e., for an over-supply, the number of graduates exceeded the number of open positions by 10 to 50%).

Sources: PRI staff analysis of 2013-14 CT Office of Higher Education Degree Completions database (accessed October 6, 2015 at: <http://www.ctohe.org/HEWeb/CompletionsPE94Search.asp>) and of CT DOL Office of Research Labor Market Information, 2012-22 State of Connecticut Occupational Projections (accessed October 6, 2015 at: <http://www1.ctdol.state.ct.us/lmi/projections.asp>). Additional information provided by: the CT State Department of Education for CT Technical High School System programs (licensed practical nurse and surgical technologist); the Office of Higher Education for private occupational schools (licensed practical nurse); and Bridgeport Hospital’s School of Nursing (surgical technologist).

## Other Occupations

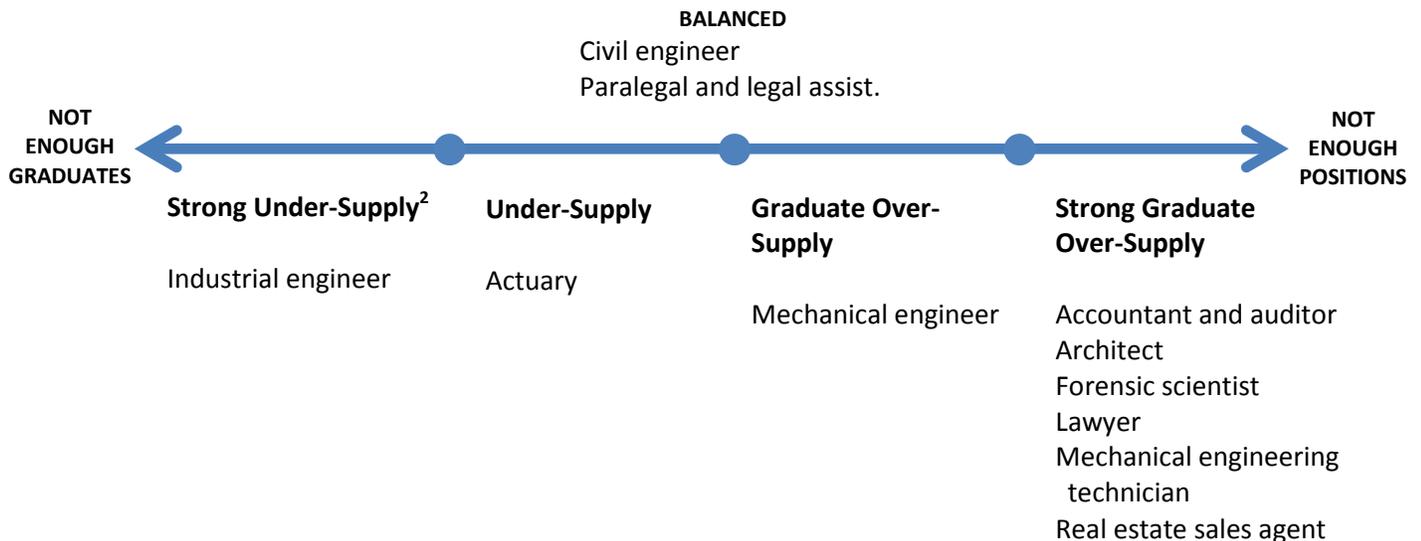
Figure 5-2 shows a majority of the other occupations (seven of 11) examined seemed to have an over-supply of graduates in the 2013-14 academic year. Six had a strong over-supply,

with graduates exceeding projected job openings by more than 50 percent. The occupations with an apparently strong over-supply were: accountant/auditor, architect, forensic scientist, lawyer, mechanical engineering technician, and real estate sales agent. One additional occupation appeared to have a lower level of over-supply, with 10 to 50 percent more graduates than projected openings.

Two occupations, civil engineer and paralegal/legal assistant, had about as many graduates as there were projected openings.

Two other occupations, actuary and industrial engineer, appeared to have an under-supply of graduates. The apparent under-supply seemed especially pronounced for the job of industrial engineer.

**Figure 5-2. Other Occupations’ Balance of Graduates and Projected Job Openings, 2013-14 Academic Year<sup>1</sup>**



Notes:

<sup>1</sup>The 2009 PRI report on this topic also included: airline pilot, copilot, and flight engineer, an occupation that does not require a specific postsecondary degree; and automotive service technician/mechanic, which does not require postsecondary education. This analysis excludes these two occupations.

<sup>2</sup>“Strong” indicates the supply was unbalanced by more than 50% (i.e., for a strong over-supply, the number of graduates exceeded the number of open positions by at least 50%). “Under-Supply” or “Over-Supply” mean the supply was unbalanced by 10 to 50% (i.e., for an over-supply, the number of graduates exceeded the number of open positions by 10 to 50%).

Sources: PRI staff analysis of 2013-14 CT Office of Higher Education Degree Completions database (accessed October 6, 2015 at: <http://www.ctohe.org/HEWeb/CompletionsPE94Search.asp>) and of CT DOL Office of Research Labor Market Information, 2012-22 State of Connecticut Occupational Projections (accessed October 6, 2015 at: <http://www1.ctdol.state.ct.us/lmi/projections.asp>). Additional information provided by the Connecticut State Colleges and Universities’ Board of Regents (for real estate sales agent graduates).

## **Supply Imbalances and College Type**

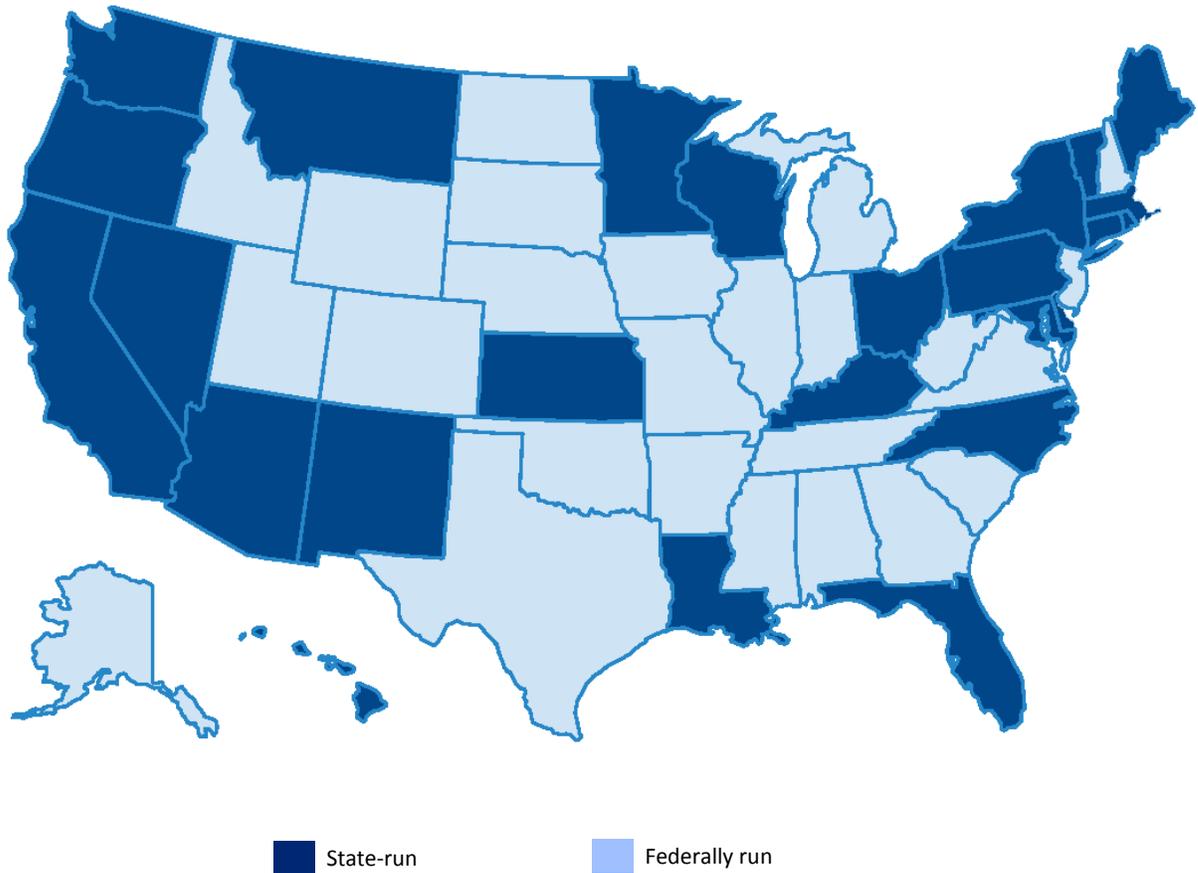
Graduates into the nine occupations with an apparent strong over-supply of graduates come from a mix of public and independent colleges. Only two, real estate sales agent and mechanical engineering technician, have a majority of new graduates coming from public colleges. Two other occupations, architect and forensic scientist, have new graduates only from private institutes.

Only one occupation examined, industrial engineer, has a strong under-supply of graduates. The majority of graduates are from independent colleges, with a very small program at a public university.

# APPENDICES



**Figure A-1: State-Run Apprenticeships**



Source: PRI staff using information from the National Association of State and Territorial Apprenticeship Directors (<http://nastad.us/links.html>, accessed September 15, 2015).



## Sponsor Survey

### Methodology

PRI staff surveyed apprenticeship sponsors in October and November 2015 using Survey Monkey. Sponsor email addresses were obtained from a database maintained by Connecticut Department of Labor (CT DOL), Office of Apprenticeship Training. All 2,244 sponsors with email addresses in the database were sent an email from PRI staff requesting that they complete the electronic survey. However, only 1,754 sponsors actually received the survey because 61 email addresses automatically opted out of the survey and 429 emails bounced back (i.e., those email addresses were invalid).

The survey asked 14 questions related to:

- sponsor characteristics;
- source of finding apprentices;
- advantages and disadvantages in sponsoring an apprentice;
- usefulness and quality of assistance provided by CT DOL; and
- completion rates of the apprenticeship.

**Response rate.** Of the 1,754 sponsors that received surveys, 257 responded, for a response rate of 15 percent. Thus, the survey reflects the opinions of only a small portion of sponsors and the results cannot be extrapolated to all sponsors.

Which industry best describes you as a sponsor?		
Answer Options	Response Percent	Response Count
Automotive	0.0%	0
Building / Construction	60.5%	155
Manufacturing and Metal	14.1%	36
Service (e.g., gasoline tank installer, insulator)	7.8%	20
Other (please specify):	17.6%	45
<i>answered question</i>		<b>256</b>
<i>skipped question</i>		<b>1</b>

Does your company or organization currently sponsor at least one apprentice?		
Answer Options	Response Percent	Response Count
Yes	85.6%	220
No	14.4%	37
<i>answered question</i>		<b>257</b>
<i>skipped question</i>		<b>0</b>

Why are you no longer an apprenticeship sponsor? (Check all that apply.)		
Answer Options	Response Percent	Response Count
Too much paperwork required	8.1%	3
Can find employees another way	2.7%	1
Cost of registration and renewal fees	16.2%	6
Not looking to grow our staff	43.2%	16
Prefer to hire experienced workers who do not need training	13.5%	5
Apprenticeship demanded a lot of time from experienced journey person(s) who supervised	8.1%	3
Poor experience working with CT Department of Labor	2.7%	1
Prefer to train new employees only in specific functions - not in multiple areas as apprenticeship requires	0.0%	0
Other (please specify):	43.2%	16
<i>answered question</i>		<b>37</b>
<i>skipped question</i>		<b>220</b>

Please select the county or counties in which you offer apprenticeship. (Check all that apply.)		
Answer Options	Response Percent	Response Count
Fairfield	29.9%	66
Hartford	42.1%	93
Litchfield	27.6%	61
Middlesex	21.3%	47
New London	20.8%	46
New Haven	31.7%	70
Tolland	16.7%	37
Windham	18.6%	41
<i>answered question</i>		<b>221</b>
<i>skipped question</i>		<b>36</b>

Is your organization a labor-management partnership (i.e., a JATC or JAC)?		
Answer Options	Response Percent	Response Count
No	94.6%	209
Yes	5.4%	12
<i>answered question</i>		<b>221</b>
<i>skipped question</i>		<b>36</b>

**How many apprentices do you currently sponsor? (Please include pre-apprentices.)**

Answer Options	Response Percent	Response Count
1-4	87.8%	195
5-9	6.8%	15
10-19	1.4%	3
20-49	0.5%	1
50 or more	3.6%	8
<i>answered question</i>		<b>222</b>
<i>skipped question</i>		<b>35</b>

**How did you find your current apprentice(s) and, if applicable, others who applied for the apprenticeship(s)? (Check all that apply.)**

Answer Options	Response Percent	Response Count
CT technical high schools	42.3%	94
CT high schools	8.1%	18
Community colleges	8.1%	18
Private occupational schools	16.2%	36
Person(s) was an employee already	26.6%	59
Employee/Owner referral of family, friend, or acquaintance	49.5%	110
Internet job posting on organization or job-seeker web page	19.4%	43
Job posting on CT Dept. of Labor's Office of Apprenticeship website	5.4%	12
One-Stop Job Centers	2.3%	5
Community organization(s)	3.6%	8
Veterans' organization(s)	5.4%	12
Other (please specify):	12.2%	27
<i>answered question</i>		<b>222</b>
<i>skipped question</i>		<b>35</b>

**Why are you a sponsor? (Check all that apply.)**

Answer Options	Response Percent	Response Count
Helps build skilled workforce in our industry	78.7%	166
Saves money on workers' pay	9.0%	19
Need apprentices' labor to meet customer volume	55.5%	117
Improves safety	18.0%	38
Encourages loyalty	31.3%	66
Decreases turnover	26.1%	55
Lets us train new employees in our culture and processes when they are just beginning to work (i.e., "no bad habits to unlearn")	66.8%	141
Gives us eligibility for state financial incentives	5.7%	12
Other (please specify):	9.0%	19
<i>answered question</i>		<b>211</b>
<i>skipped question</i>		<b>46</b>

**In the last few years, what disadvantages or problems, if any, have you experienced with the apprenticeship program? (Check all that apply.)**

<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
None	31.8%	67
Too much paperwork required	7.1%	15
Too many program rules	12.3%	26
High cost of registration and/or renewal fees	20.4%	43
Apprentices don't complete program	20.4%	43
Apprentices move to other employer after they receive training through sponsor	21.8%	46
Cannot meet hiring ratio	19.9%	42
Cannot meet job site ratio	11.8%	25
Apprenticeship demanded a lot of time from experienced journey person(s) who supervised	15.6%	33
Poor experience working with CT Department of Labor	6.6%	14
Prefer to train new employees only in specific functions - not in multiple areas as apprenticeship requires	5.2%	11
Other (please specify)	25.1%	53
<b><i>answered question</i></b>		<b>211</b>
<b><i>skipped question</i></b>		<b>46</b>

**How could the CT Department of Labor better assist you with apprenticeship? (Check all that apply.)**

<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
More help in recruiting applicants	23.2%	42
Faster apprentice registration	28.7%	52
Faster sponsor approval	8.8%	16
Easier process in setting up an apprenticeship in a new occupation	14.4%	26
Better information on finding related instruction providers	23.2%	42
Expanded related instruction options in terms of time of day, day of week, location	24.9%	45
Online access to register apprentices	47.5%	86
Faster response to questions that arise	13.8%	25
Other (please specify)	28.7%	52
<b><i>answered question</i></b>		<b>181</b>
<b><i>skipped question</i></b>		<b>76</b>

Please rate the CT Department of Labor Office of Apprenticeship on the following factors:

Answer Options	Excellent	Good	Fair	Poor	No experience with this	Rating Average	Response Count
Responding to questions within a reasonable time	23.22%	50.71%	13.74%	8.06%	4.27%	2.19	211
Responding to questions accurately	33.18%	47.39%	11.37%	3.32%	4.74%	1.99	211
Approving your sponsorship within a reasonable time	33.65%	46.60%	15.17%	4.47%	2.84%	2.00	211
Ease of sponsor approval process	34.29%	47.14%	13.81%	1.43%	3.33%	1.92	210
Registering your apprentice(s) within a reasonable time	30.33%	40.28%	21.33%	7.58%	.47%	2.08	211
Ease of apprentice registration process	29.05%	43.81%	20.48	6.19%	.48%	2.05	210
Providing clear guidance in meeting apprenticeship standards	25.71%	50%	19.02%	3.81%	1.43%	2.05	210
Marketing apprenticeships to potential sponsors	7.80%	24.39%	19.02%	12.68%	36.10%	3.45	205
Marketing apprenticeships to potential applicants	8.29%	23.90%	17.07%	13.66%	37.07%	3.47	205
Quality of Office of Apprenticeship's online information	13.46%	34.62%	24.40%	8.17%	16.35%	2.79	208
Ease of navigating Office of Apprenticeship's website	12.02%	32.21%	33.17%	7.68%	14.90%	2.81	208
Please share any other comments about the Office of Apprenticeship:							20
<i>answered question</i>							<b>211</b>
<i>skipped question</i>							<b>46</b>

Do you track completion rates for your apprentices?

Answer Options	Response Percent	Response Count
Yes	76.6%	160
No	23.4%	49
<i>answered question</i>		<b>209</b>
<i>skipped question</i>		<b>48</b>

**Thinking back to apprentices who registered with you within the last six years, about what percent completed their apprenticeship with you?**

Answer Options	Response Percent	Response Count
0%	15.3%	24
1-9%	5.7%	9
10-19%	0.6%	1
20-29%	1.3%	2
30-39%	3.2%	5
40-49%	3.2%	5
50-59%	7.6%	12
60-69%	2.5%	4
70-79%	9.6%	15
80-89%	14.6%	23
90-100%	36.3%	57
<i>answered question</i>		<b>157</b>
<i>skipped question</i>		<b>100</b>

**What are the main reasons that apprentices you sponsored did not complete their apprenticeship with you? (Check all that apply.)**

Answer Options	Response Percent	Response Count
Performance problems	37.9%	77
Found apprenticeship with another employer	15.3%	31
Decided apprenticeship did not fit his or her needs	24.1%	49
Personal issues	31.5%	64
License not required so gained skill and dropped out	3.0%	6
Don't know	6.4%	13
Not applicable - all our apprentices completed	23.6%	48
Other (please specify):	20.7%	42
<i>answered question</i>		<b>203</b>
<i>skipped question</i>		<b>54</b>

### Apprentice Survey

The program review committee staff surveyed about half of Connecticut apprentices as a way to gather information on apprentices' backgrounds and experiences. All apprentices' addresses were shared with the committee staff by CT DOL in mid-October. Program review committee staff sorted the apprentices by occupation, and then selected every other apprentice as a survey recipient. Every occupation that had at least one apprentice at the time was represented in the sample.

**Distribution.** The anonymous survey (one double-sided page) was mailed to the apprentices in late October from the program review committee, accompanied by an explanatory cover letter and a self-addressed, stamped envelope. No pre-mailing notice or post-mailing follow-up reminder was sent, due to time and resource constraints.

**Participation.** Surveys were mailed out in October to 2,699 apprentices but 88 were returned unopened due to outdated addresses. Of the 2,611 surveys that reached apprentices, 250 were completed and returned by November 15, for a response rate of 9.6 percent. (The survey instructions asked for completed surveys to be mailed by November 1.) An additional 14 survey responses were received after November 15; these were not included in the analysis.

The licensed trades were over-represented among the completed surveys: 91 percent of respondents indicated they were in a licensed trade, while about 77 percent of apprentices overall are in a licensed trade. Due to the relatively low response rate, and the over-representation of apprentices in licensed trades, it is important to recognize that the survey results must be interpreted with caution.

**Data entry and analysis.** Survey data were entered into Survey Monkey by legislative nonpartisan staff. The program review committee's study staff analyzed the data using Survey Monkey and SPSS. Committee staff also converted text responses to the most frequently responded categories, to facilitate data analysis.

**Results.** The survey results are found on the following pages.



10. How often does someone approve your working hours, in your apprenticeship booklet? **(fill in one option)** M=12%

- a. \_\_\_\_\_ times a month                    **OR**                    b. \_\_\_\_\_ times a year                    **OR**                    c. Never

*More than weekly (6 or more times a month): 2%*

*Weekly (4-5 times a month):15%*

*Biweekly (2-3 times a month): 7%*

*Monthly: 33%*

***At least monthly (sum): 56%***

*2-3 times a year: 4%*

*4-5 times a year: 2%*

*6 or more times a year: 2%*

***Less than monthly, but more often than annually (sum): 9%***

***Annually: 4%***

***Never: 31%***

11. Over the past month, who usually approves your working hours? *For those (145) who indicated someone had approved their apprenticeship booklet hours:*

a. My supervisor (may also be owner): 79%

b. Company owner (not my immediate supervisor): 12%

c. Person who worked most with me: 5%

d. Co-worker (not my immediate supervisor): 3%

#### **Prior Experience**

12. How many sponsors (employer-union partnership, or employers) have you had as a registered apprentice? M=13%

1: 73%      2-3: 23%      4-5: 2%      6 or more: 2%

13. If you've previously held a registered apprenticeship, why did the last one end? **(circle one)** 69 responses:

a. I was laid off: 55%

b. Employer was unhappy with my performance: 1%

c. I found another position that was better for me (e.g., better pay, less commute time): 25%

d. I quit without another position lined up: 6%

e. Other: *Second (or more) trade: 9%. Caretaking: 1%. Current employer forgot to pay fee: 1%. Moved here from another state: 1%.*

14. Have you previously worked in this trade, not as a registered apprentice? M=8%    a. Yes: 29%    b. No: 71%

***Among those who work in a licensed trade (Question 5): 28% had worked previously in the trade, not as a registered apprentice. (59 respondents of 209 who replied they worked in a licensed trade)***

***Among those who work in an unlicensed trade: 25% had worked previously in the trade, not as a registered apprentice. (3 respondents of 12 who replied they worked in a licensed trade)***

#### **Classes (i.e., Related Instruction)**

15. Where have you attended the majority of your apprenticeship's class component? M=3%

a. CT Tech. High School: 35%    b. Community college: 3%

c. Employer: 7%

d. JATC/union: 25%

e. Private occupational school: 30%

(including online)

16. Which factors were most important to you, in choosing where you would take classes? **(circle one or two)** M=9%

- a. Ability to start classes quickly: 23%
- b. Financial aid availability: 13%
- c. Cost: 29%
- d. Quality of classes: 27%
- e. Easy to get to class: 22%
- f. Not applicable: The required classes were part of high school: 22%
- g. Class schedule: 29%

**CT Department of Labor**

17. Since beginning your apprenticeship, have you contacted the CT Department of Labor? *M=1%*

a. Yes: 21% b. No: 79% – **skip to end**

18. If you've contacted the CT Department of Labor: What was it about? (**circle any**) *Of the 39 who responded (missing 26% of those who indicated they had contacted CT DOL):*

- a. Check on my progress toward apprenticeship completion: 74%
- b. Complaint about or disagreement with peer / colleague : *None*
- c. Complaint about or disagreement with supervisor / employer: *None*
- d. Complaint about pay, quality of on-the-job experience, or other employment issue(s): 21%
- e. Complaint about quality of required classes (i.e., Related Instruction): 5%

19. Were you satisfied with how the CT Department of Labor treated you when you contacted them? *M=6% of those who had contacted CT DOL.* a. Yes: 72% b. No: 28%

**Of those satisfied with how question or complaint was resolved** (Question 20 below): *91% satisfied with how CT DOL treated them. 9% dissatisfied.*

**Of those dissatisfied with how question or complaint was resolved:** *31% satisfied with how CT DOL treated them. 69% dissatisfied.*

20. Were you satisfied with how your question or complaint was resolved? *M=4% of those who had contacted CT DOL.*

a. Yes: 69% b. No: 31%: Please explain below – *14 responses from those who were dissatisfied with complaint resolution:*

*Long wait time: 2 responses (14%)*

*No response/call back from CT DOL: 5 (36%)*

*No/wrong information provided on what Related Instruction was needed: 2 (14%)*

*Company was not following hiring/job site ratio: 1 (7%)*

*Company was not registering all apprentices: 2 (14%)*

*Pay problem unresolved: 1 (7%)*

---

**END OF SURVEY. Thank you for completing the survey.**

**Please return in the envelope provided.**

*If you have any questions about the survey or the apprenticeship study, or if you would like to be added to the study's e-mail mailing list, please call the study's staff, Maryellen (860-240-0312) or Janelle (860-240-0302).*

## Apprenticeship Systems in Nearby States

Five nearby states' apprenticeship systems were examined to provide a sense of how Connecticut's apprenticeship system compares to those in other states. The program review committee staff chose to learn about the systems of adjacent states – Massachusetts, New York, and Rhode Island – as well as two nearby states, New Hampshire and New Jersey, whose systems are run by the U.S. Department of Labor's (U.S. DOL's) apprenticeship office. States with federally-run systems have U.S. DOL apprenticeship personnel stationed in-state and there are no state cost-sharing responsibilities. The federal government funds the entire program.

This appendix provides comparison information for the selected states and Connecticut. Additional state comparison information is given in Appendices H (on apprentice-to-journeyman ratios) and F (on occupations that offer apprenticeships).

**Methods.** The apprenticeship director of each system except New York's was interviewed. For New Hampshire and New Jersey, committee staff spoke with additional stakeholders, including but not limited to representatives of open-shop companies and labor-management partnerships. Program review committee staff unsuccessfully attempted to contact the New York apprenticeship director a half-dozen times, by both phone and e-mail; consequently, limited information is presented below, based on what was found on the state's apprenticeship website. The websites of the other included states also were examined.

### Workload, Staffing, and Activities

Table D-1 gives some basic information on apprenticeship scope and activities of nearby states plus Connecticut. Of the four main states and Connecticut, Massachusetts has the most apprentices (7,867), with Connecticut falling in the middle. Connecticut does have the most sponsors (1,568), the most apprentices per capita (1 apprentice for every 666 people), and by far the largest staff (about 10, until the recent departures of two managerial staff). Because Connecticut's apprenticeship office is generously staffed, it has the fewest apprentices per staff person and the second-fewest sponsors per staff person.

Connecticut's high staffing level has allowed it to maintain its unique tradition of traveling to sponsors to meet with them and new apprentices, to talk in-person about each party's responsibilities. Rhode Island is the only other state examined that has similar in-person meetings, but these are held at the apprenticeship office for about 12 hours each week (four hours, three days a week). The other states do not have these meetings. They focus, instead, on monitoring sponsors.

**Table D-1: Apprenticeship Scope and Activities in Selected Northeastern States**

	CT	MA	NH	NJ	RI
<b>Apprenticeship enrollment</b>					
Apprentices	5,397	7,867	1,899	5,867	1,350
Sponsors	1,568	1,439	1,266	726	650
Number of apprentices per sponsor	3	5	2	8	2
Number of apprentices per capita	666	857	699	1,523	782
<b>Staff</b>					
Number of staff	10	6	2	5	1.5
Staff roles	2 managerial, 6 field staff, 2 clerical	1 managerial, 2 field staff, 3 clerical	1 managerial, 1 field staff	2 managerial, 3 field staff	
Number of apprentices per staff person	540	1,311	950	1,173	900
Number of sponsors per staff person	157	240	633	145	433
<b>Selected staff activities</b>					
In-person registration / review of responsibilities	Yes: Staff travels to sponsor	No	No	No	Yes: 12 hrs./wk. by appointment, at apprenticeship office
Sponsor quality monitoring	No	Yes	Yes	Yes	No

Source: PRI staff communication with the apprentice director in each state, October through November 2015.

### Registration Fees and Renewal

Table D-2 shows that most of the examined states with state-administered apprenticeship systems charge registration and renewal fees, while states with federally-administered apprenticeship systems do not. (The U.S. DOL apprenticeship office does not allow fees in any state that has a federally-administered system.) Connecticut’s registration fee to the apprentice is higher than the other two fee-charging states examined, while its sponsor fee is substantially lower than the other state that uniformly charges participating sponsors.

The state-administered apprenticeship systems that charge fees all require the registration fees be paid again each year, as part of registration renewal. Massachusetts additionally requires

sponsors and apprentices to submit evidence of apprenticeship progress: the number of hours earned per year and proof of some or all coursework completion.

**Table D-2: Apprenticeship Registration Fees and Renewal in Selected Northeastern States**

	CT	MA	NH	NJ	RI
<b>Registration Fee</b>					
Apprentice	\$50	\$35	---	---	\$24
Sponsor	\$60	\$300	---	---	\$120 for unlicensed trades; no fee for licensed trades
Total	\$110	\$335	\$0	\$0	\$24 to \$144
<b>Registration Renewal</b>					
Fees for renewal	Yes	Yes	No renewal	No renewal	Yes
Other substantive renewal requirements	None	Form showing progress	No renewal	No renewal	None

Source: PRI staff communication with the apprentice director in each state, October through November 2015.

### Sponsor Discretion on Crediting Previous Experience

The states examined vary in whether employers can choose whether to accept a new apprentice’s previous experience (as either an apprentice or not). Table D-3 shows that there is variation among whether sponsors have discretion over accepting work or coursework experience. Connecticut stands alone in not allowing a sponsor to give credit for work hours acquired not as a registered apprentice, although during the study program review committee staff spoke with multiple sponsors who do give some credit for prior work, provided the person is sufficiently knowledgeable.

### Brief Description of Each Examined State’s System

Noteworthy aspects of each examined state’s system are described below.

**Connecticut.** Connecticut’s state-run system stands out for its high level of staffing (10, as of June 2015), which allows the staff to travel to sponsors to meet in-person with them and new apprentices. The office does not seem to do any formal quality reviews of sponsors.

**Table D-3: Sponsor Discretion on Crediting Previous Experience in Selected Northeastern States**

	CT	MA	NH	NJ	RI
Approved coursework	No – must accept	Yes, though are encouraged to accept	No – must accept	Yes	Yes
On-the-job training hours (as an apprentice)	Yes	Yes	Yes	Yes	No
Work hours, not as an apprentice	Not accepted	Yes, if schooling in trade is shown	Yes, up to employer	Yes, up to employer	Yes, if skills proven to employer

Source: PRI staff communication with the apprentice director in each state, October through November 2015.

**Massachusetts.** Massachusetts is the only state-run apprenticeship office among those examined that formally reviews sponsor quality. Each sponsor is visited one to three times annually. During the visit, the apprenticeship staff person meets privately with apprentices to check on experiences and progress, reviews documentation to ensure on-the-job training hours are being recorded and coursework is progressing, and checks on wages paid to ensure prevailing wage and wage progression requirements are being met. Massachusetts also expects sponsors to submit the reason why an apprentice has left, which could provide useful information but rarely is reported. Finally, Massachusetts requires the sponsor and apprentice to show progress at registration renewal, in order to earn renewal.

**New Hampshire.** New Hampshire’s apprenticeship system converted from state-run to federally-run in 2007. Control was shifted as a cost-saving measure since the state is not required to pay a share of the costs to operate the program.

The transition to a federally-run system has been slightly bumpy in one aspect. The state apprenticeship council in New Hampshire was relatively strong, when it was a state-run system. For example, the council directly approved new sponsors (instead of the apprenticeship office staff). In federally-run states, the council is expected to be purely advisory because U.S. DOL determines the rules to be followed by all federally-run apprenticeship offices. There is some dissatisfaction with the change in roles, particularly as there was some apprenticeship office turnover, but the situation seems to be resolving.

The apprenticeship office reported a strong focus on expanding apprenticeship among health care and manufacturing employers. The staff also said they are trying to partner with technical high schools for apprenticeship promotion.

*Stakeholder views.* The three stakeholders with whom program review committee staff spoke viewed the apprenticeship office as responsive, as well as assertive in promoting apprenticeship. Stakeholders noted that apprenticeship is a harder “sell” in New Hampshire

because the state lacks prevailing wage laws. It also has fewer licensed occupations and many smaller construction trades companies.

One stakeholder, affiliated with a labor-management partnership, said he would prefer a state-run apprenticeship system for more local control. Specifically, he wanted the ability to influence decisions about approving online coursework providers (which he believed should only be available to people far from in-person classes) and expanding apprenticeship into occupations with low completion wages (which he believed resulted in further depressing pay).

There were conflicting perceptions of who approves apprenticeship coursework providers. One person said that the apprenticeship office defers to the licensing boards' approval decisions, while another indicated that it seems the apprenticeship office has the final say.

**New Jersey.** New Jersey's federally-run apprenticeship system is unique in two ways. First, while the apprenticeship office is responsible for approving sponsors and registering apprentices, each county technical high school has an apprenticeship coordinator who is expected to work with sponsors in choosing and approving apprenticeship coursework. The coordinator also is to sign off on full completion of apprenticeship coursework, as a step in the apprentice's completion process, and to periodically review proprietary school curriculum to ensure it meets apprenticeship standards. There is some indication the role of the county coordinator may be minimal, at least in some locations or for labor-management partnership sponsors, and that the role might be in transition for some duties.

A second unique feature of New Jersey's apprenticeship system is that there was a concerted effort to arrange for community college credit for some apprenticeship programs. The program, called NJ Place, reviewed apprenticeship program curricula and created articulation agreements for successfully reviewed programs. The agreements were done with all 19 community colleges in the state, each of which agreed to accept at least 25 credits toward a new Associate's level degree. The labor-management partnerships and some non-labor programs (mostly in non-building occupations, such as hotel management and culinary arts) were part of the program. Funding was eliminated in 2013. It is unclear to what extent former, successful apprentices used the credits made available through the program.

*Stakeholder views.* The two stakeholders with whom program review committee staff were able to speak in-depth gave mixed reviews of apprenticeship promotion. One person felt strongly that having a federally-run office was beneficial as it "cut out the middleman" – there was no wait while a state staff person checked with U.S. DOL. The same person said that he appreciated the rules were perceived as equally enforced between labor-management partnerships and employer apprenticeships, and that the range of apprenticeable occupations was sufficient. Overall, the two stakeholders viewed the apprenticeship office as responsive and helpful.

**New York.** Based on the New York apprenticeship website, this state is unique for its focus on meeting equal employment opportunity goals. Sponsors need to seek apprenticeship office staff permission in order to recruit apprentices, and have to follow certain steps (e.g., list opening(s) with local career center for at least five full working days). Other interesting features of apprenticeship in New York are:

- The education department approves apprenticeship coursework; and
- There is no fee for participating, and sponsors usually pay the coursework cost.

**Rhode Island.** Rhode Island has a very small staff, with just one person dedicated full-time to apprenticeship. Beyond its office hours for in-person registration, unique aspects are:

- Rhode Island gives a completed apprentice two years to pass the licensure exam (compared to seven months in Connecticut);
- Due to the very low staffing level, sponsor monitoring does not happen; and
- The state's prison system is exploring offering pre-apprenticeship training programs for the prison industries (carpentry, auto body, auto repair, license plate stamping).

## Apprenticeships Available in Connecticut

The following tables show the occupations for which apprenticeships are available. The tables also indicate, for each occupation's apprenticeship: the number of apprentices (as of June 30, 2015); whether the occupation is licensed; the approximate years of on-the-job training required (with 2,000 hours equal to a year); and the number of coursework hours required.

**Table E-1: Automotive Apprenticeships' Basic Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
<b>Mechanic: 4</b>				
Auto body and fender mechanic (with painting)	---	---	4	576
Auto mechanic	---	---	4	576
Auto service mechanic	---	---	2	300
Diesel mechanic	---	---	4	600
<b>Other: 2</b>				
Auto glazier (AG-2)	31	Yes	1	144
Auto and truck painter	---	---	3	450

Source: PRI staff analysis of CT DOL website and information provided by CT DOL personnel.

**Table E-2: Electrical Apprenticeships' Basic Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
<b>Electrician: 5</b>				
Electrician (E-2)	1,608	Yes	4	720
Electrician – Industrial/maintenance	20	---	4	756
Electrician low voltage (L-6)	63	Yes	2	288
Electrician low voltage (C-6 - cables)	51	Yes	2	360
Photovoltaic electrician (PV-2)	7	Yes	2	288
<b>Other: 2</b>				
Cable splicer (L-2)	9	Yes	4	576
Electrical draftsman	1	---	4	576

Source: PRI staff analysis of CT DOL website and information provided by CT DOL personnel.

**Table E-3: Plumbing, Heating, Cooling Apprenticeships' Basic Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
<b>Gas and oil burner: 3</b>				
Gas and oil burner mechanic (limited) (B-2/B-4)	2	Yes	2	288
Gas and oil burner servicer/installer (limited: domestic and light commercial) (B-2)	83	Yes	1	288
Gas and oil burner servicer/installer (limited: any scale, for contractor) (B-4)	1	Yes	2	360
<b>Heating, piping, and/or cooling: 10</b>				
Boiler maker	---	---	3	432
Cooling mechanic (limited) (D-4)	8	Yes	2	396
Heating and cooling mechanic – Industrial maintenance	1	---	4	576
Heating, hot water, and steam mechanic (limited) (S-6)	2	Yes	4	576
Heating, piping, and cooling mechanic (limited) (S-4)	33	Yes	4	576
Heating, piping, and cooling mechanic (unlimited) (S-2)	496	Yes	4	720
Heating-cooling mechanic (limited) (S-10)	54	Yes	3	612
Journeyman / mechanic (limited: heating, hot water, steam, oil burners, gas burners, gas piping) (S-8)	14	Yes	4	576
Piping draftsman	---	---	4	576
Warm air, air conditioning, and refrigeration mechanic (limited) (D-2)	297	Yes	2	432
<b>Plumbing and related: 5</b>				
Plumbing – Industrial maintenance	---	---	4	576
Plumbing, heating, piping, and cooling mechanic (P-2/S-2)	10	Yes	6	1008
Plumbing mechanic (unlimited) (P-2)	514	Yes	4	576
Sewer, storm and water journeyman (P-6)	41	Yes	1	180
Well driller (W-2)	2	Yes	3	288

Source: PRI staff analysis of CT DOL website and information provided by CT DOL personnel.

**Table E-4: Other Building Trades' Apprenticeship Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
<b>Brick and cement: 3</b>				
Bricklayer	36	---	4	576
Bricklayer and cement finisher	---	---	4	576
Cement finisher	8	---	4	576
<b>Elevator: 2</b>				
Accessibility journey person (R-6)	2	Yes	1	144
Elevator constructor (R-2)	69	Yes	6	864
<b>Heavy equipment: 2</b>				
Heavy equipment mechanic	24	---	4	432
Heavy equipment operator	41	---	3	432
<b>Paint: 4</b>				
Painter	34	---	3	432
Painter – Decorator/taper	2	---	3	432
Painter – Industrial coating and lining application specialist)	7	---	3	432
Painter – Ornamental	---	---	3	432
<b>Roof: 2</b>				
Rofer	20	---	3	432
Rofer/waterproofers	137	---	3	432
<b>Sheet metal: 3</b>				
Sheet metal worker – Limited (SM-4)	1	Yes	2	288
Sheet metal worker – Limited (HVAC) (SM-2)	166	Yes	4	576
Sheet metal worker (SM-2)	83	Yes	4	576
<b>Terrazo/tile: 4</b>				
Terrazo mechanic	1	---	4	576
Tile finisher	2	---	2	288
Tile finisher/terrazo	---	---	2	288
Tile setter	---	---	4	576
<b>Other: 16</b>				
Arrangements draftsman	---	---	4	576
Cabinet maker	---	---	4	576

**Table E-4: Other Building Trades' Apprenticeship Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
Carpenter	439	---	4	576
Construction craft laborer	122	May qualify for P-6 license	2	288
Drywall finisher	19	---	4	576
Fire suppression systems technician (F-4)	11	Yes	3	432
Glazier (FG-2)	102	Yes	3	432
Iron worker	77	---	4	576
Millwright	6	---	4	576
Plasterer	---	---	4	576
Pointer, caulker, cleaner	25	---	3	432
Solar mechanic (ST-2)	---	Yes	2	288
Sprinkler fitter (F-2)	140	Yes	4	576
Stone/marble	---	---	4	576
Structural draftsman	---	---	4	576
Ventilation draftsman	---	---	4	576

Source: PRI staff analysis of CT DOL website and information provided by CT DOL personnel.

**Table E-5: Metal Apprenticeships' Basic Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
<b>Metal (excluding sheet metal): 15</b>				
Die maker	---	---	4	600
Die maker (four-slide)	---	---	4	600
Die sinker	---	---	4	600
Experimental machinist	---	---	4	600
Gage maker	---	---	4	600
Machinist	18	---	4	600
Maintenance machinist	1	---	4	600
Model maker	1	---	4	600
Mold maker (plastic)	2	---	4	600
Pattern maker	---	---	4	600
Tool and die maker	33	---	4	600
Tool and die maker (fourslide)	1	---	4	600
Toolmaker	24	---	4	600
Toolmaker (bench)	---	---	4	600
Toolmaker (carbide)	---	---	4	600

Source: PRI staff analysis of CT DOL website and information provided by CT DOL personnel.

**Table E-6: Machine Trades' and Manufacturing Apprenticeship Basic Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
<b>Engineer: 3</b>				
Service engineer	---	---	2	288
Service engineer (laser)	---	---	2	288
Service engineer (punch)	---	---	2	288
<b>Machine and machinist: 12</b>				
CNC production machinist	17	---	3	450
Industrial machine service engineer	3	---	2	288
Machine repairer	4	---	4	600
Machine setter (fourslide)	2	---	3	450
Machine setup mechanic	---	---	3	432
Machining technician	---	---	2	288
Machinist (EDM)	15	---	3	432
Machinist (CNC)	8	---	3	432
Machinist toolmaker	1	---	4	576
Maintenance mechanic	4	---	4	576
Tapping and threading machine setter	---	---	2	300
Toolroom machinist	---	---	3	432
<b>Plastic: 5</b>				
Injection molding setter (plastic)	---	---	2	288
Injection molding technician (plastic)	1	---	2	288
Plastic mold repairer	---	---	3	450
Plastic technician (blow molding)	---	---	4	576
Plastic process technician	---	---	4	576
<b>Quality control and assurance: 5</b>				
Electronic test technician	---	---	4	576
Non destructive test inspector	---	---	1.2	304
Quality assurance inspector	3	---	2	288
Quality assurance technologist	---	---	1.2	304
Quality control specialist	---	---	3	432
<b>Screw machine: 4</b>				

**Table E-6: Machine Trades' and Manufacturing Apprenticeship Basic Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
Automatic screw machine setter	---	---	3	432
Screw machine operator and setter	---	---	3	432
Screw machine repairer	---	---	3	450
Swiss automatic screw machine operator and set-up	1	---	3	~400
<b>Springmaker: 3</b>				
Springmaker (coiler)	---	---	3	576
Springmaker (torsion)	1	---	3	435
Springmaker (torsion CNC)	---	---	3	432
<b>Tool: 11</b>				
Tool and diemaker (carbide)	---	---	4	576
Tool and diemaker (progressive)	---	---	4	576
Tool cutter / grinder	---	---	3	432
Tool cutter / grinder (CNC)	2	---	3	150
Tool designer	---	---	4	576
Tool grinder (precision form)	---	---	3	432
Toolmaker (carbide)	---	---	4	576
Toolmaker (CNC)	---	---	3	432
Toolmaker (eyelet)	29	---	4	576
Toolmaker (fourslide)	1	---	4	576
Toolmaker (progressive)	1	---	4	576
<b>Other: 7</b>				
Aerospace fabrication	---	---	2.24	660
Armature winder	---	---	3	432
CNC wireforming	1	---	4	576
Electroplating technician	1	---	3	432
Heat treater	---	---	4	576
Mechanical draftsman	---	---	4	576
Vertical turret lathe set-up operator	---	---	1.5	216

Source: PRI staff analysis of CT DOL website and information provided by CT DOL personnel.

**Table E-7: Service and Technician Apprenticeships' Basic Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
Electronic technician – radio/TV (V-2)	---	Yes	3	432
Electronic technician – cable installer	---	---	3	440
Energy efficiency technician	---	---	1	200
Insulator	19	---	2	288
Lawn sprinkler installer and maintainer (J-4)	19	Yes	1	144
Maintenance repairer	---	---	4	576
Maintenance technician	---	---	4	576
Mechanical insulator	1	---	3	432
Pump servicer and installer (J-2)	26	Yes	2	288
Gasoline tank installer and repair (P-8)	7	Yes	1	144
Stationary engineer (OE-2)	Not avail. <sup>1</sup>	Yes	3	432
Telephone equipment servicer and installer (T-2)	49	Yes	2	288

Notes:

<sup>1</sup>Data possibly kept by Department of Consumer Protection.

Source: PRI staff analysis of CT DOL website and information provided by CT DOL personnel.

**Table E-8: Other Apprenticeships' Basic Requirements**

	Number of Apprentices	Occupation Licensed?	Years on-the-job	Coursework Hours
<b>Culinary arts: 3</b>				
Chef	---	---	3	432
Chef	---	---	4	576
Cook (hotel and restaurant)	---	---	3	432
<b>Nuclear plant: 3</b>				
Plant equipment operator	---	---	3	432
Reactor operator - nuclear	3	---	3	432
Senior reactor operator-in-training - nuclear	3	---	2.5	360
<b>Press: 4</b>				
Press operator	---	---	4	576
Press operator (offset)	---	---	4	600
Pressman (offset)	---	---	2	288
Pressroom mechanic	---	---	4	576
<b>Other: 6</b>				
Child care development specialist	---	---	2	Specific program <sup>1</sup>
Firefighter	9	---	4	576
Locksmith	---	---	3	432
Shipbuilder	---	---	4	576
Veterans disability advocate	---	---	1	144
Youth development specialist	---	---	1	144

Notes:

<sup>1</sup> CT Charts-a-Course

Source: PRI staff analysis of CT DOL website and information provided by CT DOL personnel.



## Appendix F

### Occupations with Apprentices: Connecticut and Nearby States

**Table F-1: Automotive Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Mechanic</b>						
Automobile mechanic	Inactive	4 yrs.; 600 hours				
Automobile mechanic - Truck		4; 600				
Diesel mechanic	Inactive	4; 600	Yes	Yes	3; 432	
Truck mechanic		4; 600				
<b>Other</b>						
Automotive technician specialist	Inactive			Yes		
Automobile repair service estimator		4; 600				
Auto glazier	1; 144*					
Drafter - Automotive product design					4; 576	

Notes:

\*Indicates licensed trade

"Yes" indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from apprenticeship office directors.

**Table F-2: Electrical Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
Cable splicer	4 years; 576 hrs.*		Yes	Yes		
Electrical draftsman	4; 576					
Electrician (E-2)	4; 720*	4; 600*	4; 600*	4; 576*		Yes*
Electrician - Industrial/maintenance	4; 756		Yes	Yes	4; 576	Yes
Electrician - Locomotive				Yes		
Electrician - Low voltage	2; 288*					
Electrician - Substation				Yes		
Photovoltaic electrician	2; 288*					

Notes:

\*Indicates licensed trade

“Yes” indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from apprenticeship office directors.

**Table F-3: Plumbing, Heating, Cooling, and Piping Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Boilermaker</b>						
Boilermaker fitter				Yes		
Boilermaker		3 years; 450 hours		Yes	4; 576	
<b>Gas and oil burner</b>						
Gas and oil burner mechanic - Limited	2; 288*					
Gas and oil burner servicer/installer - Limited: Domestic and light commercial	1; 288*					
Gas and oil burner service/installer - Limited (any scale, for contractor)	2; 360*			Yes		
Oil burner technician						Yes*
Propane gas						Yes
<b>Heating, piping, and/or cooling</b>						
Cooling mechanic - Limited	2; 396*	1		Yes		
Refrigeration						Yes - 2 types (regular and II)*
Refrigeration and cooling mechanic - Includes heating		4; 600	Yes	Yes	4; 576	Yes - 2 types (regular and II)
Heating and cooling mechanic - Industrial maintenance	4; 576		Yes	Yes	4; 576	
Heating, hot water, and steam mechanic - Limited	4; 576*					
Heating, piping, and cooling mechanic -	4; 576*				4; 576	

**Table F-3: Plumbing, Heating, Cooling, and Piping Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
Limited						
Heating, piping, and cooling mechanic - Unlimited	4; 720*					
Heating-cooling mechanic - Limited	3; 612*					
Journeyman/mechanic - Limited (heating, hot water, steam, oil burners, gas burners, gas piping)	4; 576*			Yes		
Pipefitter		4; 600*	Yes	Yes	5; 720	Yes - 2 types (regular and II)*
Steamfitter					4.5; 576	
Warm air, air conditioning, and refrigeration mechanic - Limited	2; 432*					
<b>Plumbing and related</b>						
Plumber - Residential					5; 720	
Plumber and pipefitter					4.5; 576	
Plumber and steamfitter					4.5; 576	
Plumbing, heating, piping, and cooling mechanic	6; 1008*	4; 600*	4; UK*	4; UK*	5; 720	Yes*
Plumbing mechanic - Unlimited	4; 576*			Yes	4; 576	
Sewer, storm, and water journeyman	1; 180*					
Well driller	3; 288*			Yes*		

Notes:

\*Indicates licensed trade

"Yes" indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from apprenticeship office directors.

**Table F-4: Carpentry and Sheet Metal Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Carpenter</b>						
Carpenter	4 years; 576 hours	4; 600	Yes	Yes	2.7; 389	Yes
Carpenter - Heavy/highway					3; 432	
Carpenter - Interior systems			Yes			
Carpenter - Lather					3; 432	
Carpenter - Rough			Yes			
Carpenter - Maintenance				Yes	4; 576	
Carpenter - Residential				Yes	2.7; 389	
<b>Sheet Metal</b>						
Sheet metal worker – Limited	2; 288*					
Sheet metal worker - Limited (HVAC)	4; 576*					
Sheet metal worker	4; 576*	4; 600*	Yes	Yes	4; 576	Yes - 2 types (regular and II)*
Sheet metal worker - Iron plate					4; 576	
Sheet metal worker - Sign hanger/rig					5; 720	

Notes:

\*Indicates licensed trade

“Yes” indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from apprenticeship office directors.

**Table F-5: Other Building Trades' Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Brick and cement</b>						
Bricklayer	4 years; 576 hours		Yes	Yes - 2 types	2.25; 324	Yes
Cement finisher	4; 576			Yes	2.25; 324	Yes
Cement mason		2; 300			2.25; 324	
<b>Construction</b>						
Construction craft laborer	2; 288		Yes	Yes	2; 288	Yes
Construction worker			Yes			
Construction manager						Yes
<b>Drafter</b>						
Drafter - Architectural					4; 576	
Drafter - Design incl. mechanical					5; 720	
Drafter - Mechanical		4; 600			4; 576	
Drafter - Structural	Inactive				4; 576	
<b>Elevator</b>						
Accessibility journeyperson	1; 144*					
Elevator constructor	6; 864*				4; 576	Yes
Elevator servicer and repairer					4; 576	
<b>Fire and sprinkler</b>						
Fire suppression systems technician	3; 432*					
Sprinkler fitter	4; 576	4; 600	Yes	Yes	5; 720	Yes*
<b>Flooring</b>						
Floor cover layer				Yes		
Floor layer				Yes		Yes
Flooring						Yes
Linoleum, resilient tile, and carpet layer					3; 432	
Resilient floor layer		4; 600				

**Table F-5: Other Building Trades' Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Glazier</b>						
Glazier	3; 432*		Yes	Yes	3; 432	Yes
Glazier - Stained glass				Yes		
<b>Heavy equipment</b>						
Heavy equipment mechanic	4; 432			Yes		
Heavy equipment operator	3; 432	3; 450			3; 432	
<b>Iron worker</b>						
Iron worker	4; 576	3; 450	Yes			Yes
Iron worker - Ornamental				Yes	3; 432	
Iron worker - Outside					3; 432	
Iron worker - Reinforcing concrete				Yes		
Iron worker - Stone derrickman and rigger					3; 432	
Iron worker - Structural steel				Yes		
<b>Paint</b>						
Painter	3; 432	3; 450	Yes	Yes		Yes
Painter - Decorator/taper	3; 432				3; 432	
Painter and decorator - Structural steel bridges					3; 432	
Painter, decorator and paperhanger					3; 432	
<b>Roof</b>						
Rofer	3; 432	3; 450		Yes	3; 432	
Rofer/waterproofer	3; 432					
<b>Stone</b>						
Stonemason	Inactive			Yes	3; 432	Yes
Marble carver, cutter, and setter					4; 576	

**Table F-5: Other Building Trades' Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Terrazo/tile</b>						
Terrazo mechanic	4; 576	1.5; 150			3; 432	
Tile finisher	2; 288	2; 300			3; 432	Yes
Tile, marble, and terrazo finisher					2.25; 288	
<b>Welder</b>						
Welder		4; 600	Yes	Yes - 3 types		
Welder - Industrial					4; 576	
<b>Other</b>						
Blacksmith		4; 600				
Building maintenance repair		2; 300			2; 288	
Cabinetmaker	Inactive			Yes	2.7; 288	Yes
Dispatcher		2; 300				
Drywall finisher	4; 576	3; 450		Yes	3; 432	Yes
Finisher						Yes
Heavy forger			Yes			
Light fixture maker				Yes		
Maintenance repairer - Building				Yes		
Metal building assembler			Yes	Yes		
Millwright	4; 576	4; 600	Yes	Yes	3; 288	
Pile driver		4; 600		Yes	2.7; 288	Yes
Plasterer	Inactive			Yes	4; 576	Yes
Pointer, caulker, cleaner	3; 432	2.45; 375			3; 432	Yes
Rigger			Yes			
Site safety manager					2; 288	
Taper		2; 300	Yes	Yes		

Notes:

\*Indicates licensed trade

"Yes" indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from office directors.

**Table F-6: Manufacturing and Plant Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Machine and Machinist</b>						
CNC production machinist	3 years; 450 hours				4; 576	
Industrial machine service engineer	2; 288					
Industrial machinery mechanic					4; 576	
Industrial truck mechanic					3; 432	
Machine builder					4; 576	
Machine tool builder					5; 720	
Machine repairer	4; 600				4; 576	
Machine setter - Fourslide	3; 450					
Machinist	4; 600	4; 600	Yes	Yes	4; 576	Yes
Machinist - EDM	3; 432				4; 576	
Machinist - CNC	3; 432		Yes			Yes
Machinist toolmaker	4; 576				5; 720	
Maintenance machinist	4; 600				4; 576	
Maintenance mechanic	4; 576	4; 600	Yes	Yes	4; 576	
Maintenance repairer - Industrial				Yes		
<b>Other Metal</b>						
Model maker	4; 600				4; 576	
Tool and die maker	4; 600	4; 600	Yes	Yes	4; 576	
Tool and die maker - Fourslide	4; 600					
Toolmaker	4; 600	4; 600	Yes	Yes	4; 576	
Toolmaker – Eyelet, Fourslide, Progressive (3 types)	4; 576					

**Table F-6: Manufacturing and Plant Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Plant maintenance</b>						
Plant maintenance - Electrician/mechanic					4; 576	
Plant maintenance - Mechanic					3; 432	
Plant maintenance - Millwright					4; 576	
Plant maintenance - Pipefitter					4; 576	
Plant maintenance - Plumber and steamfitter					4; 576	
Plant welder					4; 576	
<b>Plastic</b>						
Injection molding machine operator				Yes		
Injection molding technician - Plastic	2; 288					
Model maker - Plastic	4; 600			Yes		
Model and mold maker - Plastic				Yes		
Mold maker, die-casting and plastic molding					4; 576 - 2 types	Yes
Mold setter				Yes	3; 432	
Plastic process technician	Inactive				4; 576	Yes
Plastics fabricator			Yes			
<b>Quality control and assurance</b>						
Quality control technician				Yes		
Quality assurance/control inspector	2; 288	3; 450		Yes		
<b>Screw, spring, tool</b>						
Screw machine set-up	Inactive				4; 576	

**Table F-6: Manufacturing and Plant Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
and operator						
Swiss automatic screw machine operator and set-up	3; 400					
Springmaker – Torsion CNC	3; 435					
Tool cutter/grinder - CNC	3; 150					
<b>Other CNC</b>						
CNC Setup - Milling and turning			Yes			
CNC Setup - Turning			Yes			
CNC systems maintenance					4; 576	
CNC wireforming	4; 576					
<b>Other</b>						
Drafter - Tool design					4; 576	
Experimental assembler				Yes		
Electronics technician - Manufacturing only					4; 576	
Electroplating technician	3; 432					
Fabricator -Assembler metal rod				Yes		
Industrial manufacturing technician			Yes			
Industrial equipment wirer and assembler					4; 576	
Mechanical engineering technician		4; 600				
Mechatronics technician			Yes			
Metal fabricator			Yes			
Metal refinisher					3; 432	
Non-destructive tester			Yes			
Packer mechanic					5; 720	

**Table F-6: Manufacturing and Plant Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
Painter - Industrial coating and lining application specialist	3; 432			Yes		Yes
Patternmaker	Inactive			Yes - 3 types		
Patternmaker - Wood					5; 720	
Plater			Yes			
Precision grinder		3; 450				
Reinforcing metal worker				Yes		
Vacuum furnace technician - Manufacturing only					4; 576	

Notes:

\*Indicates licensed trade

“Yes” indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from apprenticeship office directors.

**Table F-7: Service and Technician Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Asbestos and insulator</b>						
Asbestos worker		4 years; 600 hours				
Insulator (can include asbestos)	2; 288	4; 600	Yes	Yes	4; 576	Yes
<b>Electrical</b>						
Electric motor repair		3; 450				
Electrical technician				Yes		
Electrical technician - Calibration					4; 576	
Electromechanical technician				Yes		
Electronics technician			Yes	Yes		
<b>Energy-related (Conservation and renewable)</b>						
Energy efficiency technician	Inactive				1; 144	
Home performance laborer			Yes	Yes		
Mechanical insulator	3; 432					
Renewable energy contractor						Yes
<b>Instrument</b>						
Instrument electrical mechanic					3.75; 432	
Instrument mechanic				Yes	4; 576	
Instrument technician					4; 576	
<b>Landscape and lawn</b>						
Landscape gardener				Yes		
Landscape management technician				Yes		
Landscape nursery manager					4; 576	
Landscape technician		2; 300		Yes		
Lawn sprinkler installer	1; 144*					

and maintainer

<b>Lines</b>						
Light and power line erector		2.5; 375	Yes	Yes		
Line installer and repairer		4; 600	Yes	Yes	3.5; 432	
Line maintainer			Yes			
<b>Stationary/Operating engineer</b>						
Stationary/operating engineer	3; 432*	4; 600	Yes	Yes*	4; 576	Yes
Operating engineer					2; 288	
Operating engineer - Grade and paving equipment					2; 288	
<b>Other</b>						
Chemical laboratory technician					4; 576	
Micro-computer repair technician					4; 576	
Multi-story window and building surface cleaner					1.5; 144	
Office machine servicer				Yes		
Pump servicer and installer	2; 288*					
Gasoline tank installer and repair	1; 144*					
Small engine and equipment mechanic					2; 288	
Surveyor assistant - instrument				Yes		
Telephone equipment servicer and installer / Telecommunications Technician	2; 288*	4; 600	Yes	Yes		Yes*

Notes:

\*Indicates licensed trade

"Yes" indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from apprenticeship office directors.

**Table F-8: Transportation Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Airplanes</b>						
Aircraft mechanic		4 years; 672 hours	Yes			
Airframe mechanic		1.55; UK				
Airframe and power plant mechanic		4; 600				
Air transportation pilot		3.39; UK				
<b>Ships</b>						
Canvas worker - Ships		3; 450	Yes			
Joiner - Shipbuilder			Yes			
Machinist - Ships			Yes			
Marine carpenter						Yes
Marine electric and electronic technicians						Yes
Marine painter - 2 types (interior and exterior)						Yes
Marine rigger						Yes
Pipefitter - Ships and boats				Yes		
Shipfitter			Yes			
Shipwright	Inactive		Yes			

Notes:

\*Indicates licensed trade

“Yes” indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from apprenticeship office directors.

**Table F-9: Other Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
<b>Culinary arts</b>						
Baker - Hotel and restaurant				Yes		
Cook - Any industry	Inactive			Yes	3 years; 432 hours	
Cook - Hotel and restaurant	Inactive	3; 450	Yes	Yes		
Cook - Pastry			Yes	Yes		
<b>Emergency response and public safety</b>						
Correction officer		1; 150 or 3; 450		Yes		
Emergency medical technician		2; 300		Yes*		
Firefighter	4; 576	3; 450		Yes*	3; 432	
Firefighter paramedic		4; 600			3.5; 432	
Paramedic		2; 300				
Police officer		3; 450		Yes	2; 288	
School safety agent					2; 288	
<b>Firearms</b>						
Gunsmith		Yes				
Gunsmith - Small arms repairer		Yes				
<b>Health</b>						
Certified nurse assistant				Yes		
Counseling aide - HIV/AIDS					1; 144	
Counseling aide - Social living skills					1; 144	
Dental assistant			Yes	Yes*		
Dispensing optician		3; 450*		Yes*		
Medical assistant			Yes			
Medical coder			Yes			
Medical secretary			Yes			

**Table F-9: Other Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
Nurse assistant				Yes		
Pharmacy support staff			Yes			
Phlebotomist			Yes			
Physical therapy aide				Yes		
<b>Office/Office-based</b>						
Career development			Yes			
General clerk		2; 300				
Computer operator		3; 450		Yes		
Computer programmer		2; 300				
Internetworking associate						Yes
Office manager		4; 300		Yes		
Purchasing agent		4; 600				
<b>Press operator</b>						
Press operator - Offset	Inactive	2; 300		Yes		
Press operator - Offset lithographic					4; 576	
Press operator - Lithographic					3; 432	
<b>Power plant</b>						
Nuclear plant reactor operator	3; 432					
Senior nuclear plant reactor operator-in-training	2.5; 288					
Power plant instrument technician		4; 600				
Radiation protection technician					4; 532	
Turbine operator		3; 450				
<b>Signs</b>						
Commercial sign painter		4; 600				
Sign erector				Yes		

**Table F-9: Other Apprenticeships in Connecticut and Nearby States, with Years On-the-Job Training and Hours of Coursework Required**

	CT	MA	NH	NJ	NY	RI
Sign painter				Yes		
<b>Other</b>						
Animal trainer				Yes		
Childcare development specialist	Inactive		Yes	Yes		Yes
Direct support professional					1.5; 216	
Fish hatchery worker				Yes		
Floral designer				Yes		
Heavy truck driver		1; 150				
Horticulturist				Yes		
Housekeeper				Yes		
Locksmith	Inactive			Yes*		
Re-entry counselor		2; 300				
Teacher aide		2; 300	Yes	Yes		
Vibration analysis specialist		4; 600				
Scenic artist					3; 432	
Stage technician				Yes		
Upholsterer - Inside				Yes		

Notes:

\*Indicates licensed trade

“Yes” indicates that apprenticeship is available but no information was available on the apprenticeship requirements.

Source: PRI staff analysis of apprenticeship office information from each state and materials from apprenticeship office directors.

## Connecticut's Hiring Ratio

### HIRING RATIO CHART

<u>ALL TRADES</u>	
Apprentices	Licensee (Journeyman or Contractor)
1	1
2	2
3	5
4	8
5	11
6	14
7	17
8	20
9	23
10	26
Ratio continues at 3 journeyman to 1 apprentice	

Source: CT DOL. Accessed September 22, 2015 at: <https://www.ctdol.state.ct.us/progsupt/appren/online/HiringRatioChart.pdf>.



## Appendix H

**Table H-1: Nearby States' Apprentice-to-Journeyperson Hiring Ratios<sup>1</sup>**

	Massachusetts	New Jersey	New York	Rhode Island: Job Site Ratios for Commercial Work (Residential Work: 1:1)
<b>Hiring Ratio</b>				
Electrical	2:3	1:3	1:1, then 4 additional journeypersons for each apprentice (1:4)	1:1, then 1:3
Plumber	1:5	1:4	1:1, then 1:3	<i>Not provided</i>
Pipefitter	1:3	1:4	1:1, then 1:3	1:1, then 1:3 for level I <sup>2</sup>
HVACR	1:1	1:4	1:1, then 1:3	1:1, then 1:3, for level I <sup>2</sup>
Painter	1:1	1:3	1:1, then 1:3	1:1, then 1:3
Sprinkler fitter	1:3	<i>NA</i> <sup>2</sup>	1:1, then 1:2	<i>Not provided</i>
Carpenter	<i>Not provided</i>	1:5	1:1, then 1:4	1:1, then 1:5
Ironworker	<i>Not provided</i>	1:7	1:1, then 1:4	1:1, then 1:5
Roofer	<i>Not provided</i>	1:4	1:1, then 1:2	1:1, then 1:5
Sheet metal	<i>Not provided</i>	1:3	1:1, then 1:3	1:1, then 1:3 <sup>1</sup>

Notes:

<sup>1</sup> New Hampshire ratio information was unclear and so it is omitted from this table.

<sup>2</sup> Unlimited license. For limited license, ratio remains 1:1.

Source: PRI staff interviews with apprenticeship directors in Massachusetts and New Hampshire, document shared by apprenticeship director in New Jersey, and apprenticeship website information for New York and Rhode Island (accessed October 26, 2015 at: <https://labor.ny.gov/apprenticeship/general/occupations.shtm> and <http://www.dlt.ri.gov/apprenticeship/RatioExample.htm>).



## Wage Analysis

The wages for selected apprentice occupations were analyzed for livability, as described in Chapter 2. Average wages for apprentices and journeypersons were compared to four livability standards.

### Methods

Actual apprentice wage information was gathered from two major sources: the job search and salary engine Simply Hired (with the Hartford area selected as the location), and the Connecticut Department of Labor's (CT DOL) required prevailing wages (using 50 percent of the journeyperson wage rate, which is the minimum wage for a new apprentice on a prevailing wage project, for Hartford). Journeyperson average hourly wage data were taken from CT DOL's Occupational Wages and Employment data (statewide average 2015 first quarter) for the four of the five construction occupations (all except sprinkler fitter, which did not have a distinct occupational category in the database) as well as machinist. Sprinkler fitter average wage data came from Simply Hired. Journeyperson wage data also came from CT DOL's required prevailing wages for all the construction trades.

The occupations were selected to have representation from the two most populous apprentice occupations from both licensed and unlicensed trades, a small licensed trade, and a small unlicensed trade in a field targeted for apprenticeship expansion (manufacturing). The occupations chosen were: carpenter, electrician, plumber, roofer, sprinkler fitter, and machinist.

The livability standards used were: 200 percent of the Federal Poverty Level; Connecticut United Ways's ALICE Survival (basics only) and Stability (allowing for savings and limited recreation) standards; and Connecticut's Self-Sufficiency Standard, which is a project of the state's Permanent Commission on the Status of Women. These standards were chosen because:

- 200 percent of the Federal Poverty Level is sometimes used as a guideline for government program eligibility;
- ALICE received substantial publicity upon its publication and therefore might be well-known among policymakers; and
- Connecticut's Self-Sufficiency Standard was the "livable wage" benchmark used for the 2009 Legislative Program Review and Investigations Committee study *Alignment of Postsecondary Education and Employment*.

The single-person and four-person family (two adults and two kids) versions of each standard were used; these are listed (and rounded) in Table I-1 below. As the table shows, the Federal Poverty Level-based standard is the least generous for a family, and for single adults, it is approximately tied for least-generous with the ALICE Survival standard.

**Table I-1: Livability Standards<sup>1</sup>**

	Single Adult	Four-person Family (2 Adults + 2 Kids)
200% Federal Poverty Level	\$11	\$23
CT United Ways's ALICE Survival	\$11	\$32
CT United Ways's ALICE Stability	\$15	\$56
CT PCSW's Self-Sufficiency <sup>2</sup>	\$13	\$38

Notes:

<sup>1</sup> Each standard is rounded to the nearest dollar and is based on a 40-hour workweek.

<sup>2</sup> PCSW stands for the Permanent Commission on the Status of Women.

Sources: For 200% Federal Poverty Level, PRI staff analysis of U.S. Department of Health of Human Services, "2015 Poverty Guidelines," accessed October 27, 2015 at: <http://www.medicaid.gov/medicaid-chip-program-information/by-topics/eligibility/downloads/2015-federal-poverty-level-charts.pdf>. CT ALICE standards: Connecticut United Ways, "ALICE: Asset Limited, Income Constrained, Employed – Connecticut; Study of Financial Hardship, 2014," accessed October 27, 2015 at: [http://alice.ctunitedway.org/files/2014/11/14UW-ALICE-Report\\_CT.pdf](http://alice.ctunitedway.org/files/2014/11/14UW-ALICE-Report_CT.pdf). CT PCSW standards: "The Self-Sufficiency Standard for Connecticut 2015," accessed October 27, 2015 at: [http://www.selfsufficiencystandard.org/docs/CT2015\\_SSS.pdf](http://www.selfsufficiencystandard.org/docs/CT2015_SSS.pdf).

## Analysis

The following charts show, based on a 40-hour workweek, the wages and wage standards, as well as the share of the wage standard that is covered by the average, minimum, and prevailing wages.

**Table I-2: Plumber Apprenticeship and Journeyman Wages, Compared to Livability Standards**

	Wage	Share of Livability Standard Covered by Wage			
		200% Federal Poverty Level	ALICE: Survival	ALICE: Stability	Self-Sufficiency
<b>Single Adult: Apprentice</b>					
CT DOL Minimum	\$11	98%	100%	73%	82%
Average	\$22	197%	201%	146%	165%
Prevailing wage minimum	\$20	182%	185%	135%	152%
<b>Family: Apprentice</b>					
CT DOL minimum	\$11	48%	34%	20%	29%
Average	\$22	95%	68%	39%	59%
Prevailing wage minimum	\$20	88%	63%	36%	54%
<b>Single Adult: Completed Apprenticeship/Journeyman</b>					
CT DOL Minimum	\$22	197%	201%	146%	165%
Average	\$29	261%	265%	193%	218%
Prevailing wage	\$41	367%	374%	272%	307%
<b>Family: Completed Apprenticeship/Journeyman</b>					
CT DOL minimum	\$22	95%	68%	39%	59%
Average	\$29	126%	90%	52%	78%
Prevailing wage	\$41	176%	126%	73%	108%

Source: PRI staff analysis of information from:  
 Interviews with CT DOL staff (CT DOL minimum wages);  
 CT DOL, "Occupational Employment and Wages, Statewide Wages," for Q1 2015 (average completed wage), accessed October 27, 2015 at: <http://www1.ctdol.state.ct.us/lmi/wages/statewide2015.asp>;  
 CT DOL, "Prevailing Wage Rates System, Annual Adjusted July 1<sup>st</sup> Rates," location of Hartford, accessed October 25, 2015 at: <https://www2.ctdol.state.ct.us/WageRatesWeb/WageRatesbyTown.aspx?Town=Hartford>;  
[www.simplyhired.com](http://www.simplyhired.com) for Hartford, CT (apprentice average wage).

**Table I-3: Electrician Apprenticeship and Journeyman Wages, Compared to Livability Standards**

	Wage	Share of Livability Standard Covered by Wage			
		200% Federal Poverty Level	ALICE: Survival	ALICE: Stability	Self-Sufficiency
<b>Single Adult: Apprentice</b>					
CT DOL Minimum	\$11	98%	100%	73%	82%
Average	\$20	179%	182%	133%	150%
Prevailing wage minimum	\$19	171%	174%	127%	143%
<b>Family: Apprentice</b>					
CT DOL minimum	\$11	48%	34%	20%	29%
Average	\$20	87%	62%	36%	53%
Prevailing wage minimum	\$19	83%	59%	34%	51%
<b>Single Adult: Completed Apprenticeship/Journeyman</b>					
CT DOL Minimum	\$22	197%	201%	146%	165%
Average	\$28	247%	251%	183%	206%
Prevailing wage	\$38	342%	348%	254%	286%
<b>Family: Completed Apprenticeship/Journeyman</b>					
CT DOL minimum	\$22	95%	68%	39%	59%
Average	\$28	120%	85%	49%	73%
Prevailing wage	\$38	166%	118%	68%	102%

Source: PRI staff analysis of information from:  
 Interviews with CT DOL staff;  
 CT DOL, "Occupational Employment and Wages, Statewide Wages," for Q1 2015 (average completed wage), accessed October 27, 2015 at: <http://www1.ctdol.state.ct.us/lmi/wages/statewide2015.asp>;  
 CT DOL, "Prevailing Wage Rates System, Annual Adjusted July 1<sup>st</sup> Rates," location of Hartford, accessed October 25, 2015 at: <https://www2.ctdol.state.ct.us/WageRatesWeb/WageRatesbyTown.aspx?Town=Hartford>;  
[www.simplyhired.com](http://www.simplyhired.com) for Hartford, CT (apprentice average wage).

**Table I-4: Carpenter Apprentice and Journeyman Wages, Compared to Livability Standards**

	Wage	Share of Livability Standard Covered by Wage			
		200% Federal Poverty Level	ALICE: Survival	ALICE: Stability	Self-Sufficiency
<b>Single Adult: Apprentice</b>					
CT DOL Minimum	\$11	98%	100%	73%	82%
Average	\$19	170%	173%	126%	142%
Prevailing wage minimum	\$16	141%	143%	104%	118%
<b>Family: Apprentice</b>					
CT DOL minimum	\$11	48%	34%	20%	29%
Average	\$19	82%	59%	34%	51%
Prevailing wage minimum	\$16	68%	49%	28%	42%
<b>Single Adult: Completed Apprentice/Journeyman</b>					
CT DOL Minimum	\$22	197%	201%	146%	165%
Average	\$25	221%	225%	164%	184%
Prevailing wage	\$31	282%	287%	209%	235%
<b>Family: Completed Apprentice/Journeyman</b>					
CT DOL minimum	\$22	95%	68%	39%	59%
Average	\$25	107%	76%	44%	66%
Prevailing wage	\$31	136%	97%	56%	84%

Source: PRI staff analysis of information from:  
 Interviews with CT DOL staff;  
 CT DOL, "Occupational Employment and Wages, Statewide Wages," for Q1 2015 (average completed wage), accessed October 27, 2015 at: <http://www1.ctdol.state.ct.us/lmi/wages/statewide2015.asp>;  
 CT DOL, "Prevailing Wage Rates System, Annual Adjusted July 1<sup>st</sup> Rates," location of Hartford, accessed October 25, 2015 at: <https://www2.ctdol.state.ct.us/WageRatesWeb/WageRatesbyTown.aspx?Town=Hartford>;  
[www.simplyhired.com](http://www.simplyhired.com) for Hartford, CT (apprentice average wage).

**Table I-5: Sprinkler Fitter Apprentice and Journeyman Wages, Compared to Livability Standards**

	Wage	Share of Livability Standard Covered by Wage			
		200% Federal Poverty Level	ALICE: Survival	ALICE: Stability	Self-Sufficiency
<b>Single Adult: Apprentice</b>					
CT DOL Minimum	\$11	98%	100%	73%	82%
Average	\$15	134%	137%	100%	112%
Prevailing wage minimum	\$21	185%	189%	137%	155%
<b>Family: Apprentice</b>					
CT DOL minimum	\$11	48%	34%	20%	29%
Average	\$15	65%	46%	27%	40%
Prevailing wage minimum	\$21	90%	64%	37%	55%
<b>Single Adult: Completed Apprentice/Journeyman</b>					
CT DOL Minimum	\$22	197%	201%	146%	165%
Average	\$22	192%	196%	143%	161%
Prevailing wage	\$41	370%	377%	275%	310%
<b>Family: Completed Apprentice/Journeyman</b>					
CT DOL minimum	\$22	95%	68%	39%	59%
Average	\$22	93%	66%	39%	57%
Prevailing wage	\$41	179%	128%	74%	110%

Source: PRI staff analysis of information from:

Interviews with CT DOL staff;

CT DOL, "Prevailing Wage Rates System, Annual Adjusted July 1<sup>st</sup> Rates," location of Hartford, accessed October 25, 2015 at: <https://www2.ctdol.state.ct.us/WageRatesWeb/WageRatesbyTown.aspx?Town=Hartford>;

[www.simplyhired.com](http://www.simplyhired.com) for Hartford, CT (apprentice average wage and completed average wage).

**Table I-6: Roofer Apprentice and Journeyperson Wages, Compared to Livability Standards**

	Wage	Share of Livability Standard Covered by Wage			
		200% Federal Poverty Level	ALICE: Survival	ALICE: Stability	Self-Sufficiency
<b>Single Adult: Apprentice</b>					
CT DOL Minimum	\$10	90%	91%	66%	75%
Average	\$20	179%	182%	133%	150%
Prevailing wage minimum	\$17	149%	152%	110%	124%
<b>Family: Apprentice</b>					
CT DOL minimum	\$10	43%	31%	18%	27%
Average	\$20	87%	62%	36%	53%
Prevailing wage minimum	\$17	72%	51%	30%	44%
<b>Single Adult: Completed Apprentice/Journeyperson</b>					
CT DOL Minimum	\$20	179%	182%	133%	150%
Average	\$26	230%	234%	171%	192%
Prevailing wage	\$33	298%	303%	221%	249%
<b>Family: Completed Apprentice/Journeyperson</b>					
CT DOL minimum	\$20	87%	62%	36%	53%
Average	\$26	111%	79%	46%	68%
Prevailing wage	\$33	144%	103%	60%	89%

Source: PRI staff analysis of information from:  
 Interviews with CT DOL staff;  
 CT DOL, "Occupational Employment and Wages, Statewide Wages," for Q1 2015 (average completed wage) , accessed October 27, 2015 at: <http://www1.ctdol.state.ct.us/lmi/wages/statewide2015.asp>;  
 CT DOL, "Prevailing Wage Rates System, Annual Adjusted July 1<sup>st</sup> Rates," location of Hartford, accessed October 25, 2015 at: <https://www2.ctdol.state.ct.us/WageRatesWeb/WageRatesbyTown.aspx?Town=Hartford>;  
[www.simplyhired.com](http://www.simplyhired.com) for Hartford, CT (apprentice average wage).

**Table I-7: Machinist Apprentice and Journeyperson Wages, Compared to Livability Standards**

	Wage	Share of Livability Standard Covered by Wage			
		200% Federal Poverty Level	ALICE: Survival	ALICE: Stability	Self-Sufficiency
<b>Single Adult: Apprentice</b>					
CT DOL Minimum	\$9	82%	83%	61%	68%
Average	\$14	125%	128%	93%	105%
<b>Family: Apprentice</b>					
CT DOL minimum	\$9	40%	28%	16%	24%
Average	\$14	61%	43%	25%	37%
<b>Single Adult: Completed Apprentice/Journeyperson</b>					
CT DOL Minimum	\$18	161%	164%	120%	135%
Average	\$22	196%	200%	145%	164%
<b>Family: Completed Apprentice/Journeyperson</b>					
CT DOL minimum	\$18	78%	56%	32%	48%
Average	\$22	95%	68%	39%	58%

Source: PRI staff analysis of information from:

Interviews with CT DOL staff;

CT DOL, "Occupational Employment and Wages, Statewide Wages," for Q1 2015 (average completed wage), accessed October 27, 2015 at: <http://www1.ctdol.state.ct.us/lmi/wages/statewide2015.asp>;

CT DOL, "Prevailing Wage Rates System, Annual Adjusted July 1<sup>st</sup> Rates," location of Hartford, accessed October 25, 2015 at: <https://www2.ctdol.state.ct.us/WageRatesWeb/WageRatesbyTown.aspx?Town=Hartford>;

[www.simplyhired.com](http://www.simplyhired.com) for Hartford, CT (apprentice average wage).

## Coursework Availability

The coursework component of an apprenticeship may be completed in a wide variety of ways. To more fully understand coursework locations, availability of academic credit, cost, and demand among potential apprentice students, among other characteristics, the program review committee staff surveyed the providers.

### Methods

The Connecticut Department of Labor's (CT DOL) apprenticeship office shared a list of coursework providers with program review committee staff in September 2015. Committee staff developed a coursework provider survey and distributed it to each provider except for the Connecticut Technical High Schools, using e-mail when possible and regular mail when not. (Personnel from the technical high schools had already been interviewed, and information had been requested.) Committee staff contacted each provider multiple times in order to acquire responses from as many coursework providers as possible. In the end, full responses were received from:

- Each of the six Connecticut community colleges approved to be coursework providers;
- Three of the five industry-affiliated programs;
- Four of the eight private occupational schools; and
- 18 of 19 labor-management partnerships.

For the seven programs that did not respond to the survey, PRI staff examined the organizations' websites in an attempt to learn about programs offered and costs.

Committee staff also attempted to survey two organizations that had been on CT DOL's list of approved coursework providers but that were not actually approved providers, according to personnel at those organizations. These organizations were Griffin Electric (the single employer-based program on the original list) and Bay State School of Technology.

### Results

The following tables display where approved apprentice instruction is found in Connecticut. Each category of provider (e.g., technical high schools, colleges, industry-related) has its own table. Within the table, the approved providers are listed, along with their locations, the occupations for which coursework is available with license type denoted parenthetically when appropriate, and whether academic credit is available (indicated by a star\*). Further results are found in the report's main body (Chapter 3).

**Table J-1: Apprenticeship Coursework Offered by Colleges**

Approved Related Instruction Provider, Location	Electrical	Plumbing, Heating, Cooling	Other Building	Manufacturing	Service and Technician	Other
Asnuntuck Community College (CC), Enfield				CNC Machinist*		
Goodwin College, E. Hartford <sup>1</sup>				CNC Production*		
Housatonic CC, Bridgeport & Milford <sup>2</sup>				CNC Machinist,* Tool & Die		
Manchester CC, Manchester				CNC Machinist*		
Manchester CC & Tunxis CC, Farmington <sup>2</sup>				CNC Operator		
Middlesex CC, Meriden				CNC Machinist*		
Naugatuck Valley CC, Waterbury and Danielson <sup>2</sup>				CNC Machinist*		
Quinebaug Valley CC, Danielson				CNC Machinist*		

Notes:

\*Postsecondary academic credit is available.

(...) Indicates license type, if appropriate.

<sup>1</sup> Goodwin College's program just began. It received approval to be a coursework provider in August 2015.

<sup>2</sup> These schools operate apprentice coursework programs for particular employers, in addition to the CNC machinist programs.

Source: PRI staff communications with CT State Colleges and Universities system staff.

**Table J-2: Apprenticeship Coursework Offered by Connecticut Technical High Schools, Excluding Secondary-Level Instruction**

Approved Related Instruction Provider, Location	Electrical	Plumbing, Heating (H), Cooling (C)	Other Building	Manufacturing	Service and Technician	Other
<p><b>All of the following high schools offer coursework toward each of the listed programs. Not every course is offered each semester. Offerings are adjusted based on enrolled students' needs, according to the Connecticut State Department of Education.</b></p>						
Abbott, Danbury	Electrician (E-2)	H (S-4)	Sheet metal		Gas tank (P-8)	
Bristol	Low-voltage (L-6)	H&C (S-2)	(SM-2)		Lawn sprinkler (J-4)	
Bullard-Havens, Bridgeport	Photovoltaic (PV-2)	Limited H (S-6, S-8)			Pump servicer (J-2)	
Norwich	Telephone interconnect (C-6)	Limited H&C (S-10)			Telephone interconnect (T-2)	
Prince, Hartford		Plumber (P-2)				
Whitney, Hamden		Refrigeration (D-4)				
		Sewer...lines (P-6)				
		Warm air H&C (D-2)				
<p><b>In addition, Bristol offers 1-2 year full-day programs (900 hours per year) in various areas, including some that involve apprentice occupations, as listed below. These programs are open to both adult and secondary school students.</b></p>						
Bristol		HVAC/R occupations (licensed)			Electronic technician	

Notes:

(...) Indicates license type, if appropriate.

Source: PRI staff analysis of information provided on the Connecticut Technical High Schools' website (accessed November 20, 0215 at: <http://www.cttech.org/AdultED/index.htm>).

**Table J-3: Apprenticeship Coursework Offered by Industry-Supported or Affiliated Schools**

Approved Related Instruction Provider, Location	Electrical	Plumbing, Heating (H), Cooling (C)	Other Building	Manufacturing	Service and Technician	Other
<b>Based on responses to survey for this study:</b>						
Construction Education Center, Rocky Hill		H&C (S-2) Plumber (P-2) Sewer...lines (P-6) Warm air H&C (D-2)	Carpenter Sheet metal (SM-2)			
CT Alarm & Systems Integrators Association, Inc., Meriden	Low-voltage (L-6)					
Independent Electrical Contractors, Rocky Hill	Electrician (E-2)					
<b>Based on web information, due to survey non-response:</b>						
Entech, Cromwell		H&C (S-2) Warm air H&C (D-2)			Oil burner (B-2)	
Manufacturing Alliance Service Corp., Waterbury				Yes; specific info. not given		

Notes:

(...) Indicates license type, if appropriate.

Source: PRI staff analysis of information provided by the organizations and on their websites.

**Table J-4: Apprenticeship Coursework Offered by Labor-Management Partnerships (All in Building Occupations)**

Approved Related Instruction Provider, Location	Electrical	Plumbing, Heating, Cooling	Other Building
<b>Electrician</b>			
Local 35, Hartford	Electrician (E-2)*		
Local 90, Wallingford	Electrician (E-2)*		
Local 488, Monroe	Electrician (E-2)		
<b>Ironworker</b>			
Local 15, Hartford			Ironworker*
Local 424, North Haven			Ironworker
<b>Rofer and waterproofer</b>			
Local 9, Rocky Hill			Roofer and waterproofer
Local 12, North Haven			Roofer and waterproofer
<b>Sheet metal</b>			
Local 38, Brewster, NY			Sheet metal (SM-2)
Local 40, Rocky Hill			Sheet metal (SM-2)*
<b>Other</b>			
Bricklayer and Allied Craftworkers, Wallingford			Bricklayer, Cement mason, Marble finisher, Mosaic worker, Pointer-caulker-cleaner, Terrazo finisher, Tile finisher, Tile setter
Carpenter, Wallingford			Carpenter*

**Table J-4: Apprenticeship Coursework Offered by Labor-Management Partnerships (All in Building Occupations)**

Approved Related Instruction Provider, Location	Electrical	Plumbing, Heating, Cooling	Other Building
Elevator constructor, East Hartford			Elevator constructor (R-2)
Finishing Trades Institute of Southern New England, Berlin & Groton			Drywall finisher, Glazier (FG-2), Painter-Decorator/Commercial, Painter-Industrial coatings and lining application specialist
Insulator – Local 33 (Heat and Frost Insulators), Wallingford			Mechanical insulator
Millwright (Eastern Millwright Regional Council), Allston, MA			Millwright
Laborer (New England Laborers’ Training Fund), Pomfret			Construction craft laborer*
Operating engineer (Local 478 ATSIF), Meriden			Heavy equipment mechanic*, Heavy equipment operator
Plumber (Local 777), Meriden		Plumber (P-2)*, Heating and Cooling-Pipefitting (S-2)*, Heating and Cooling-HVACR (D-2, S-2)*	
Sprinkler fitter (Local 669), Rocky Hill			Sprinkler fitter (F-2)*

Notes:

\*Postsecondary academic credit is available.

(...) Indicates license type, if appropriate.

Source: Apprenticeship coursework provider responses to PRI staff survey (October 2015) and follow-up calls to non-respondents.

**Table J-5: Apprenticeship Coursework Offered by Private Occupational Schools**

Approved Related Instruction Provider, Location <sup>1</sup>	Electrical	Plumbing, Heating (H), Cooling (C)	Other Building	Manufacturing	Service and Technician	Other
<b>Based on responses to survey for this study:</b>						
Industrial Management and Training Institute, Waterbury	Electrician (E-2)* or part of that program for: Low-voltage (L-6) Photovoltaic (PV-2) Telephone interconnect (C-6)	H&C (S-2)* or part of the program for: H (S-4), Limited H (S-6, S-8), Limited H&C (S-10), Refrigeration (D-4), Warm air H&C (D-2). Plumber (P-2),* or part of the program for Sewer...lines (P-6)			Part of E-2 for Telephone interconnect (T-2). Part of P-2 for: Gas tank (P-8), Lawn sprinkler (J-4), Pump servicer (J-2).	
Lincoln Tech, New Britain, Shelton	Electrician (E-2). Might also take part of that program for other electrical licenses (listed above).	H&C (S-2). Might also take part of that program for related licenses (listed above).			Part of E-2 might be taken for Telephone interconnect (T-2).	

**Table J-5: Apprenticeship Coursework Offered by Private Occupational Schools**

Approved Related Instruction Provider, Location <sup>1</sup>	Electrical	Plumbing, Heating (H), Cooling (C)	Other Building	Manufacturing	Service and Technician	Other
Porter and Chester Institute, Branford, Enfield, Rocky Hill, Stratford, & Watertown	Electrician (E-2)* Low-voltage (L-6)	HVACR – H & C (S-2). * Might also take part of that program for related licenses (listed above).			Part of E-2 might be taken for Telephone interconnect (T-2).	
Ridley-Lowell Business & Technical Institute, New London	Electrician (E-2)*					

**Based on web information, due to survey non-response; unclear if all listed programs have been approved:**

Branford Hall Career Institute, Southington & Windsor		HVAC/R; specific info. not given				
New England Institute of Technology, Rhode Island	Electrical or electrical with renewable energy*	Heating, refrigeration-air conditioning, & plumbing; specific info. not given*				
Penn Foster Career School, online		HVAC/R; specific info. not given Plumber (P-2)	Carpenter		Electronics technician, Landscaping technology	
Tooling U-SME, online				Multiple		

---

Notes:

\*Postsecondary academic credit is available, according to the survey respondent.

(...) Indicates license type, if appropriate.

<sup>1</sup>Bay State School of Technology was listed as an approved provider in the PRI staff's October 2015 Interim Update on this study, per information shared by CT DOL, but the school itself informed PRI staff that it is not an approved provider in Connecticut.

Source: PRI staff analysis of information provided by the organizations and on their websites.



### Licensure Exam Pass Rates by Type of Apprenticeship Coursework Provider

**Methods.** Licensure exam results were analyzed to understand whether pass rates appear to differ among graduates of different apprenticeship coursework programs. The Department of Consumer Protection provided program review committee staff with licensure exam results (by type of license) from July 2012 through June 2015 for each apprenticeship coursework provider.

Committee staff chose to limit the examination to five occupational licenses, due to the time required to complete the analysis. Three were the licenses with the most apprentices: electrician (E-2), plumber (P-2), and heating, piping, and cooling mechanic (S-2). Two were smaller licenses: sprinkler fitter (F-2) and glazier (FG-2).

The analysis was further limited to first-time test-takers, because unduplicated pass-rate data were unavailable. Many, if not all, exams were revised during the period examined; the results from all exams were used.

**Caution.** The results, shown in Table K-1, should be interpreted with caution for numerous reasons, listed below.

- Differences among coursework provider types could be due, in whole or part, to differences in the apprentice completer populations, not due to actual variations in the quality of coursework.
- None of the differences among coursework provider types reached the level of statistical significance.
- For some licenses and types of providers, there were marked differences between providers within a type – for example, four technical high schools had an electrician exam pass rate under 50 percent, while two others had pass rates of at least 70 percent.<sup>1</sup>
- The technical high school system’s data includes both persons who finished an adult evening apprenticeship coursework program and those who fulfilled the coursework requirement through earning a high school diploma from a system school – and it is reasonable to expect perhaps more-recent completers (of evening apprenticeship coursework) would have better success on an exam than those who finished classes a year or more ago.

---

<sup>1</sup> Only schools that had at least 10 test-takers were considered. Five more technical high schools had at least 10 test-takers and pass rates between 50 and 69 percent.

---

It is also interesting to note that a substantial portion of test-takers were not recent apprentice completers. This share was 31 percent for the five trades examined, and ranged from 21 percent (heating, piping, and cooling mechanic) to 60 percent (glazier).<sup>2</sup>

**Results.** When aggregating the data from the five occupations, the results show:

- The technical high school system’s completing apprentices had the lowest pass rate of the four types of coursework providers, due mainly to the relatively poor performance of its graduates on the electrician exam, although no difference was statistically significant;
- Industry-affiliated schools’ completing apprentices did about as well as those from labor-management partnerships; and
- Private occupational schools’ completing apprentices performed slightly better than those from the technical high schools, although no difference was statistically significant.

The analysis also indicated that a few of the providers recently declared “deficient” by CT DOL had relatively strong pass rates in the exam(s) reviewed, including one industry-affiliated provider whose coursework does not meet the 144 hours per year “recommended” standard. While a few of the “deficient” providers had poor pass rates, most were middle-of-the-road.

---

<sup>2</sup> The reasons for test-takers not being recent apprentice completers include: 1) the apprentice completed years ago but for whatever reason did not test until 2012 or onward; 2) the person was trained or licensed out-of-state; 3) the person attended schooling and acquired experience but never was a registered apprentice, yet the occupational board agreed to let the person take the exam; and 4) the person’s licensed lapsed and the occupational board allowed the person to re-test.

---

**Table K-1: Licensure Exam Pass Rates by Type of Apprenticeship Coursework Provider, for Five Occupations, July 2012 through June 2015**

<b>First-time Test-Takers</b>	<b>CT Tech. High Schools</b>	<b>Private Occup. Schools</b>	<b>Industry- Affiliated Schools</b>	<b>Labor- Mgmt. Partnership</b>	<b>Not Recent Apprentice Completers</b>
<b>Unlimited electrician (E-2)</b>					
First-time pass rate	52%	59%	70%	64%	53%
Number of test-takers	258	232	20	157	243
Share of test-takers	28%	25%	2%	17%	27%
<b>Sprinkler fitter (F-2)</b>					
First-time pass rate	Sup.	---	55%	41%	46%
Number of test-takers	2	0	29	22	28
Share of test-takers	2%	0%	36%	27%	35%
<b>Glazier (FG-2)</b>					
First-time pass rate	---	---	Sup.	61%	54%
Number of test-takers	0	0	1	33	50
Share of test-takers	0%	0%	1%	39%	60%
<b>Unlimited plumber (P-2)</b>					
First-time pass rate	51%	38%	Sup.	50%	48%
Number of test-takers	128	13	5	48	95
Share of test-takers	44%	4%	2%	17%	33%
<b>Unlimited heating, piping, and cooling mechanic (S-2)</b>					
First-time pass rate	64%	65%	73%	71%	66%
Number of test-takers	69	77	37	59	110
Share of test-takers	20%	22%	11%	17%	35%
<b>TOTAL for the five occupations' exams</b>					
First-time pass rate	53%	60%	67%	61%	55%
Number of test-takers	457	322	92	319	526
Share of test-takers	27%	19%	5%	19%	31%

Note: None of the differences among the provider types (for any particular license, or overall across the licenses) reached the level of statistical significance ( $p < 0.05$ ), using a Chi-square test.

Source: PRI staff analysis of Department of Consumer Protection data.



## College Credit for Apprenticeship Coursework

Some apprenticeship coursework providers offer college credit upon completion. The tables below give information on college credit arrangements, for those coursework providers that responded to the program review committee staff survey.

**Table L-1: CNC Machining Approved Coursework Providers with College Credit Arrangements**

	Hrs. Apprentice Coursework	Hrs. College Credit	Academic Credit Awarded By:
<b>Colleges</b>			
Asnuntuck Community College (CC)	576	34	Asnuntuck CC
Goodwin College	270	18	Goodwin College
Housatonic CC	576	34	Housatonic CC
Manchester CC	576	<34	Manchester CC
Middlesex CC	576	16-34	Middlesex CC
Naugatuck Valley CC	576	34	Naugatuck Valley CC
Quinebaug Valley CC	576	34	Quinebaug Valley CC

Source: PRI staff analysis of approved coursework providers' responses to October 2015 survey and additional assistance provided by Board of Regents staff.

**Table L-2: Electrician Approved Coursework Providers with College Credit Arrangements**

	Hrs. Apprentice Coursework	Hrs. College Credit	Academic Credit Awarded By:
<b>Industry-Related</b>			
Independent Electrical Contractors	720	40	American Council on Education
<b>Labor-Management Partnerships</b>			
Local 90	1,100	62	American Council on Education
Local 35	1,000	Up to 60	American Council on Education
<b>Private Occupational Schools</b>			
Porter and Chester Institute	720	74 quarter credit hours	Porter and Chester Institute
IMTI	900	Varies	Either 40 from Pima CC (AZ) or 9 from Post Univ. (Waterbury)
Ridley-Lowell	720	76.5 quarter credits	Ridley-Lowell

Source: PRI staff analysis of approved coursework providers' responses to October 2015 survey.

**Table L-3: Plumbing, Heating, Piping, and Cooling Approved Coursework Providers with College Credit Arrangements**

	Hrs. Apprentice Coursework	Hrs. College Credit	Academic Credit Awarded By:
<b>Labor-Management Partnership</b>			
Local 777 (S-2, P-2)	1,200	32	Washtenaw CC (MI)
<b>Private Occupational Schools</b>			
IMTI: HVACR (S-2) & Plumber (P-2)	917 & 733	Varies	Either 40 from Pima CC (AZ) or 9 from Post Univ. (Waterbury, CT)
Porter and Chester (S-2)	720	78 quarter-credits	Porter and Chester

Source: PRI staff analysis of approved coursework providers' responses to October 2015 survey.

**Table L-4: Other Occupations Approved Coursework Providers with College Credit Arrangements**

	Hrs. Apprentice Coursework	Hrs. College Credit	Academic Credit Awarded By:
<b>Labor-Management Partnerships</b>			
Carpenter	300	19	Charter Oak State College
Heavy equipment mechanic (Operating engineers)	1300	42	Charter Oak State College
Ironworker – Local 15	832	Unsure	Wentworth Institute of Technology (MA) and Ivy Tech (IN)
Laborer	320	20	Bunker Hill CC (MA) and Community College of RI
Sheet metal – Local 40	800	Up to 56	American Council on Education
Sprinkler fitter	720	32	Washtenaw CC (MI)
<b>Private Occupational School</b>			
Low-voltage electrician: Porter and Chester	360	76 quarter- credits	Porter and Chester

Source: PRI staff analysis of approved coursework providers' responses to October 2015 survey.

**Table M-1: Department of Consumer Protection Trainee Occupations**

	<b>&gt;1 Year On-the-Job Training Required?</b>	<b>Years Required</b>
<b>Electrical</b>		
Limited electrical sign (C-8)	Yes	1
<b>Plumbing, heating, cooling</b>		
Boilermaker technician (BM-2)	Yes	1
Limited heating and cooling journey person (nuclear, fossil fuel, or petrochemical facilities) (MT-2)	Yes	3
Limited heating and cooling journey person (valves) (VT-2)	Yes	3
Limited heating, piping and cooling JP (natural and LP-gas) (G-2)	---	0.5
<b>Other building occupations</b>		
Limited conveyor journey person (R-8)	Yes	2
Limited hearth journey person (HPG-2)	---	0.25
Limited hoists, cranes, and lifts journey person (R-10)	Yes	2
Limited sheet metal journey person hood systems (SM-6)	Yes	1
Limited spa and pool journey person (SP-2)	Yes	1
Limited welding journey person (G-8)	Yes	1
<b>Manufacturing</b>		
Limited process piping journey person (PP-2)	Yes	2
<b>Service and technician: Antenna</b>		
Antenna installation and repair technician (V-6)	---	0.5
Limited antenna satellite technician (V-4)	---	0.06
<b>Service and technician: Driller and drain</b>		
Driller limited to geoexchange bore hole drilling (WG-8)	Pending	Pending

**Table M-1: Department of Consumer Protection Trainee Occupations**

	<b>&gt;1 Year On-the-Job Training Required?</b>	<b>Years Required</b>
Limited direct exchange geothermal driller (W-10)	Pending	Pending
Limited non-water or monitoring well driller (W-4)	Yes	3
Limited water well driller (W-2)	Yes	3
<b>Service and technician: Radio</b>		
Radio certified electronic technician (R-2)	---	0.5
Radio certified restricted (no repair) (RR-2)	---	0.5

Source: PRI staff analysis of information provided by the Department of Consumer Protection.

**Table N-1: Supply and Demand for Healthcare Practitioners and Related Technical Occupations, Connecticut 2014 Graduates**

Occupation <sup>1</sup>	Shortfall (-) or Excess (+)	Projected Need	Total Graduated	Public Graduated	Independent Graduated
<b>Behavioral Health</b>					
Social worker	+120	366	486	417	69
Substance use counselor	-9	115	106	93	13
<b>Nurse</b>					
Licensed practical and vocational nurse	+121	374	495	169	326
Registered nurse	+501	1,223	1,724	1,069	655
<b>Occupational (Occ.) and Physical (Phys.) Therapy</b>					
Occ. therapist	36	62	98	0	98
Occ. therapy assistant	+52	29	81	23	58
Phys. therapist	-26	214	188	18	170
Phys. therapist assistant	+10	32	42	42	0
<b>Other</b>					
Dental hygienist	+42	157	199	28	171
Emergency medical technician and paramedic	-42	185	143	133	10
Nutrition and dietitian	+52	24	76	17	59
Pharmacist	+49	103	152	97	55
Radiation therapist	+15	78	93	51	42
Surgical technologist	+10	41	51	39	12

Notes:

<sup>1</sup>The 2009 PRI report on this topic also included veterinarian, an occupation that requires a doctoral degree unavailable in Connecticut, and veterinary technologist and technician, an occupation that does not require postsecondary education (though options are available). This analysis excludes both occupations.

Sources: PRI staff analysis of multiple information sources: 2013-14 CT Office of Higher Education Degree Completions database (accessed October 6, 2015 at: <http://www.ctohe.org/HEWeb/CompletionsPE94Search.asp>). CT DOL Office of Research Labor Market Information, 2012-22 State of Connecticut Occupational Projections (accessed October 6, 2015 at: <http://www1.ctdol.state.ct.us/lmi/projections.asp>). Additional information provided by the CT State Department of Education for CT Technical High School System programs and by Bridgeport Hospital's School of Nursing.

**Table N-2: Connecticut 2014 Graduates, By Postsecondary Institution, for Health Care Practitioners and Related Technical Occupations**

Occupation <sup>1</sup>	Total Graduated	Public Graduated	Public Graduated	Independent Graduated
<b>Behavioral Health</b>				
Social worker	486	86%	CCSU: 36 ECSU: 28 SCSU: 108 WCSU: 36 UConn: 209	14% Sacred H. U.: 22 U. St. Joseph: 47
Substance use counselor	106	88%	Gateway CC: 26 Manch. CC: 23 Middlesex CC: 1 Naug. V. CC: 40 Tunxis CC: 3	Alb. Mag. Coll.: 13
<b>Nurse</b>				
Licensed practical and vocational nurse	495	34%	CT Tech. HS: 169	66% Lincoln Tech: 34 Porter & Chester: 119 Stone Acad.: 173
Registered nurse	1,724	62%	Capital CC: 110 Gate. CC: 104 Housat. CC: 18 Naug. V. CC: 88 Northwt. CC: 28 Norwalk CC: 81 Three R. CC: 83 CCSU: 83 SCSU: 122 WCSU: 80 UConn: 272	38% Fairfield U.: 125 Goodwin C.: 168 Quinnip. U.: 118 Sacred H. U.: 57 St. Vince. C: 101 U. Hartford: 29 U. St. Joseph: 57
<b>Occupational (Occ.) and Physical (Phys.) Therapy</b>				
Occ. therapist	98	0%	---	100% Quinnip. U.: 60 Sacred H. U.: 38
Occ. therapy assistant	81	28%	Housat. CC: 9 Manch. CC: 14	72% Goodwin C.: 30 Lincoln C.: 28
Phys. therapist	188	10%	UConn: 18	90% Quinnip. U.: 64 Sacred H. U.: 60 U. Hartford: 46

**Table N-2: Connecticut 2014 Graduates, By Postsecondary Institution, for Health Care Practitioners and Related Technical Occupations**

Occupation <sup>1</sup>	Total Graduated	Public Graduated	Public Graduated	Independent Graduated	Independent Graduated
Phys. therapist assistant	42	100%	Capital CC: 2 Housat. CC: 6 Manch. CC: 4 Naug. V. CC: 7 Northw. CC: 1 Norwalk CC: 17 Tunxis CC: 5	0%	---
<b>Other</b>					
Dental hygienist	199	14%	Tunxis CC: 28	86%	Lincoln C.: 19 U. Bridgept.: 91 U. N. Haven: 61 Goodwin C.: 10
Emergency medical technician and paramedic	128	93%	Asnun. CC: 9 Capital CC: 37 Gatew. CC: 16 Manch. CC: 15 Northw. CC: 14 Norwalk CC: 26 Quin. V. CC: 17	7%	
Nutritionist and dietician	76	22%	UConn: 17	78%	U. N. Haven: 46 U. St. Joseph: 13
Pharmacist	152	64%	UConn: 97	36%	U. St. Joseph: 55
Radiation therapist	93	55%	Capital CC: 13 Gatew. CC: 3 Middle. CC: 17 Naug. V. CC: 18	45%	St. Vince. C.: 20 U. Hartford: 22
Surgical technologist	51	76%	Manch. CC: 18 CT Tech. HS: 21	24%	Bridgept. Hosp: 12

Notes:

<sup>1</sup>The 2009 PRI report on this topic also included: veterinarian, an occupation that requires a doctoral degree unavailable in Connecticut; veterinary technologist and technician, an occupation that does not require postsecondary education (though options are available); and real estate sales agents, an occupation that requires postsecondary education but for which no accurate data could be found. This analysis excludes all three occupations.

Sources: PRI staff analysis of multiple information sources: 2013-14 CT Office of Higher Education Degree Completions database (accessed October 6, 2015 at: <http://www.ctohe.org/HEWeb/CompletionsPE94Search.asp>) and of CT DOL Office of Research Labor Market Information, 2012-22 State of Connecticut Occupational Projections (accessed October 6, 2015 at: <http://www1.ctdol.state.ct.us/lmi/projections.asp>). Additional information provided by the CT State Department of Education for CT Technical High School System programs and by Bridgeport Hospital's School of Nursing.



**Table O-1: Supply and Demand for Other Workers, Connecticut 2014 Graduates**

Occupation <sup>1</sup>	Shortfall (-) or Excess	Projected Need	Total Graduated	Public Graduated	Independent Graduated
<b>Engineering</b>					
Civil engineer	-10	138	128	89	39
Industrial engineer	-83	127	44	5	39
Mechanical engineer	58	242	300	160	140
Mechanical engineering technician	17	27	44	36	8
<b>Legal</b>					
Lawyer	316	219	535	190	345
Paralegal and legal assistant	-6	150	144	84	60
<b>Other</b>					
Accountant and auditor	290	663	953	496	457
Actuary	-13	65	52	52	0
Architect	54	45	99	0	99
Forensic scientist	106	4	110	0	110
Real estate sales agent	444	28	472	472	0

Notes:

<sup>1</sup>The 2009 PRI report on this topic also included: airline pilot, copilot, and flight engineer, an occupation that does not require a specific postsecondary degree; and automotive service technician/mechanic, which does not require postsecondary education. This analysis excludes these two occupations.

Sources: PRI staff analysis of 2013-14 CT Office of Higher Education Degree Completions database (accessed October 6, 2015 at: <http://www.ctohe.org/HEWeb/CompletionsPE94Search.asp>) and of CT DOL Office of Research Labor Market Information, 2012-22 State of Connecticut Occupational Projections (accessed October 6, 2015 at: <http://www1.ctdol.state.ct.us/lmi/projections.asp>). Additional information provided by the Connecticut State Colleges and Universities' Board of Regents (for real estate sales agent graduates).

**Table O-2: Connecticut 2014 Graduates, By Postsecondary Institution, for Other Workers**

Occupation <sup>1</sup>	Total Graduated	Public Graduated	Public Graduated	Public Graduated	Independent Graduated
<b>Engineering</b>					
Civil engineer	128	70%	CCSU: 11 UConn: 78	30%	U. Hartford: 28 U. N. Haven: 11
Industrial engineer	44	11%	UConn: 5	89%	Fairfield U.: 15 U. N. Haven: 24
Mechanical engineer	300	53%	CCSU: 25 UConn: 135	47%	Fairfield U.: 24 U. Bridgeport: 16 U. Hartford: 45 U. N. Haven: 30 Yale U.: 25
Mechanical engineering technician	44	82%	Gateway CC: 1 Three R. CC: 11 CCSU: 24	18%	U. Hartford: 8
<b>Legal</b>					
Lawyer	535	36%	UConn: 190	64%	Quinnip. U: 115 Yale U.: 230
Paralegal and legal assistant	144	58%	Manch. CC: 25 Naug. V. CC: 31 Norwalk CC: 28	42%	Lincoln Coll.: 5 Post U.: 20 U. Hartford: 26 U. N. Haven: 9
<b>Other</b>					
Accountant and auditor	953	52%	CCSU: 133 ECSU: 37 WCSU: 62 UConn: 264	48%	Fairfield U.: 118 Post U.: 78 Quinnipiac U.: 55 Sacred Ht. U.: 42 U. Bridgeport: 43 U. Hartford: 90 U. N. Haven: 23 U. St. Joseph: 8
Actuary	52	100%	UConn: 52	0%	---
Architect	99	0%	---	100%	U. Hartford: 11 Yale U.: 88
Forensic scientist	110	0%	---	100%	U. N. Haven: 110
Real estate sales agent	472	100%	CCs: 472	0%	---

Notes:

<sup>1</sup>The 2009 PRI report on this topic also included: airline pilot, copilot, and flight engineer, an occupation that does not require a specific postsecondary degree; and automotive service technician/mechanic, which does not require postsecondary education. This analysis excludes these two occupations.

Sources: PRI staff analysis of 2013-14 CT Office of Higher Education Degree Completions database (accessed October 6, 2015 at: <http://www.ctohe.org/HEWeb/CompletionsPE94Search.asp>) and of CT DOL Office of Research Labor Market Information, 2012-22 State of Connecticut Occupational Projections (accessed October 6, 2015 at: <http://www1.ctdol.state.ct.us/lmi/projections.asp>). Additional information provided by the Connecticut State Colleges and Universities' Board of Regents (for real estate sales agent graduates).

**Addendum**

**Post-Study Information on Educator Alignment Data  
Updating the 2009 PRI Study  
*Alignment of Postsecondary Education and Employment***

## **Addendum to *Apprenticeship Programs and Workforce Needs (December 2015)***

[Note: The study report entitled *Apprenticeship Programs and Workforce Needs* approved by the PRI committee in December 2015 did not contain the information presented below as part of the 2009 PRI alignment study update, due to unexpected data issues, and so was not formally accepted by the committee. It is provided here for information's sake.]

To analyze supply and demand of educator occupations, the program review committee staff compared: 1) requested data from the Connecticut State Department Education (CSDE) on the number of newly certified educators from in-state programs in 2014;<sup>1</sup> to 2) 2014-15 academic year district hiring data collected by CSDE. The hiring data are published in an annual data bulletin. The data bulletin gives a variety of supply and demand related data, such as the number of positions districts were looking to fill for the start of the school year – which was used as the “demand” portion of the committee staff’s analysis – and the median number of applicants for those positions.

Comparing these data, Figure 1 shows that 59 percent of the educator occupations examined (13 of 22) seemed to have a strong under-supply for the 2014-15 academic year. These positions ranged from language-related (e.g., bilingual education teacher), special education, a few subjects in grades 7-12 (e.g., mathematics), and administration and support-related (e.g., library media specialist). Another four occupations, including teachers in three of the four core secondary (7-12) subjects (English, history and social studies, and science – with mathematics as the other core subject) as well as in elementary education, appeared to have a more moderate under-supply.

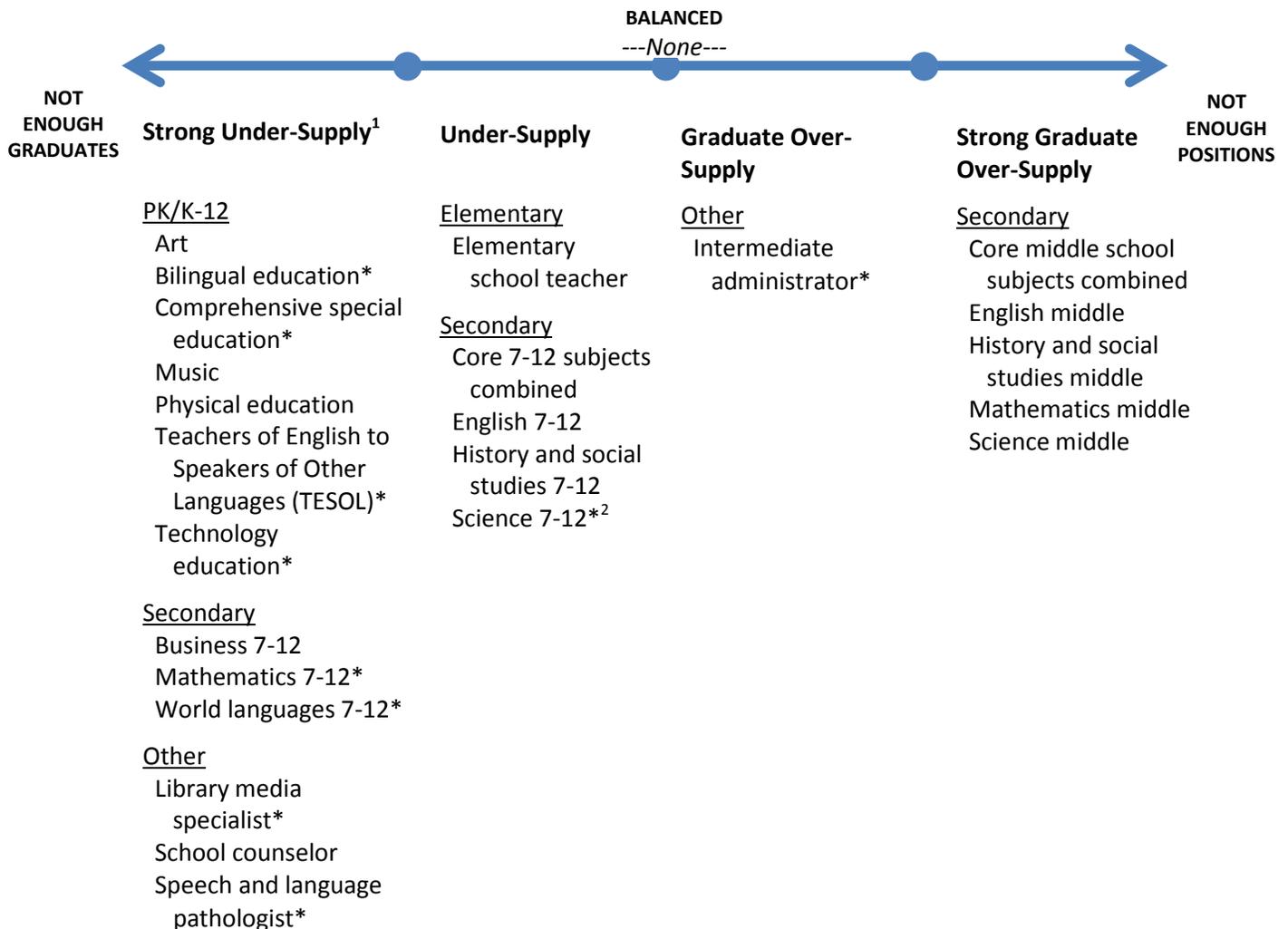
On the other hand, the four middle school-specific teaching endorsements seemed to have a strong over-supply. The over-supply was because teachers with the same-subject (e.g., English) endorsements for grades 7-12 (which is actually valid down to grade 5) generally are welcome to apply for and accept middle school-specific positions. Teachers with middle school endorsements (valid for grades 4-8), however, generally are not eligible for openings to teach in grades 7-12, and there are many fewer districts seeking middle school-specific endorsements. For example, in 2014-15, districts had 326 positions to fill in English 7-12 and another 65 positions that needed only the more limited middle school English endorsement. There was also over-supply of intermediate administrators, who are educators that can hold leadership positions other than superintendent (e.g., principal).

The program review committee staff also examined how well the supply and demand analysis based on the above method compared to the education department’s own analysis of which educator occupations are relatively under- or over-supplied. Specifically, the analysis was compared to the education department’s list of the ten “teacher shortage areas,” also found in the CSDE annual hiring data bulletin. The bulletin states that the teacher shortage areas are the top ten most-difficult-to-fill educator occupations, based on rankings developed from the hiring data

---

<sup>1</sup> The number of new educators entering the profession through Teach for America was also included in the overall Connecticut supply calculation. Two types of Teach for America educators were included: those who had entered the program for the first time in 2014 (who were given CSDE registration, not certification), and those who were newly certified in 2014 (to teach in any Connecticut public school) after serving in Teach for America for two years.

**Figure 1. Educator Occupations' Balance of Supply (Newly Certified Educators from Connecticut Programs) and Projected Job Openings, 2014-15 Academic Year**



Notes:

\*Indicates 2014-15 academic year shortage area. CSDE annually designates ten endorsements that it believes will be under-produced as shortage areas for the upcoming school year.

<sup>1</sup> "Strong" indicates the supply was unbalanced by more than 50% (i.e., for a strong over-supply, the number of graduates exceeded the number of open positions by at least 50%). "Under-Supply" or "Over-Supply" mean the supply was unbalanced by 10 to 50% (i.e., for an over-supply, the number of graduates exceeded the number of open positions by 10 to 50%).

<sup>2</sup> Includes Biology, Chemistry, Earth Science, General Science, and Physics.

Sources: PRI staff analysis of information provided by CT State Department of Education (CSDE) and of CSDE's October 2015 "Data Bulletin: Public School Hiring Trends and Certification Subject Shortage Areas for 2015-16," accessible on December 7, 2015 at: <http://www.sde.ct.gov/sde/lib/sde/pdf/evalresearch/databulletinoct2015.pdf>. In addition, CSDE's May 2014 "Data Bulletin: Public School Hiring Trends and Certification Subject Shortage Areas for 2014-15" provided the 2014-15 shortage areas.

presented in the bulletin. The ranking for each occupation, provided in the bulletin, indicates how relatively hard it was to find a well-qualified person for that specific occupation. The shortage areas are important because educators in them might receive greater student loan and mortgage assistance, and districts may hire retired educators in those areas without earnings limits. The shortage areas are reviewed annually, but there were no changes in the two most recent lists. In Figure 1, CSDE-designated teacher shortage areas are indicated by a star (\*).

The results of the program review committee staff analysis match well, overall, with the 10 CSDE-designated teacher shortage areas for the 2014-15 academic year. Eight of the 13 areas the committee staff analysis found to have a strong under-supply were also declared shortage areas. The other two declared shortage areas were science 7-12 and intermediate administrator. Science 7-12 seemed to have a more moderate under-supply (with 46 percent of demand not met by in-state graduates), while intermediate administrator appeared to have a moderate over-supply (with supply at 119 percent of demand) according to the program review committee staff analysis.

Another area of difference is that the committee staff's data indicate two other endorsements, art PK-12 and business 7-12, had a markedly more severe under-supply (with 80 percent of demand not met) than a few of the declared shortage areas. Those declared shortage areas were mathematics 7-12, with 70 percent of demand not met according to committee staff's data, and speech and language pathology, with 66 percent not met.

### **Supply Imbalances and College Type**

Most (19) of the 22 educator occupations examined get new college graduates (with new certification) either from entirely (five occupations) or mostly (14 occupations) public colleges. Similarly, most (12) of the 13 occupations for which program review committee staff found a strong under-supply get most or all of their new educators from public colleges.

Of the three education occupations that have most or all of newly certified personnel coming from independent colleges, two were found to have a strong under-supply (including one occupation with a shortage area designation, TESOL) and one (elementary education) a moderate under-supply.

### **Educator Supply and Demand**

The following tables give information on educator occupations' supply and demand for each endorsement. An endorsement is the subject in which the educator may teach (e.g., science) or role the educator may hold (e.g., school counselor).

The supply data examined was the number of newly certified or registered educators with each endorsement, coming from Connecticut sources (colleges, the Alternate Route to Certification – or ARC – program, and Teach for America locations in the state). The supply data might underestimate supply as the data counted only one (primary) endorsement for each graduate, according to the Connecticut State Department of Education (CSDE), which produced the data for this study. The supply data are from the 2014 calendar year.

The demand data are from an annual CSDE publication that describes statewide hiring trends by each endorsement. The demand data used was the number of positions districts attempted to fill for the fall start of the 2014-15 academic year.

**Table 1: Educator Occupations’ Estimated Balance of Graduates and Job Openings, Fall 2014**

Position	Demand: Total Positions to Fill (For Fall 2014)	Supply: Newly Certified Educators With Endorsement* (2014)		Difference: Shortfall (-) or Surplus (All CT sources)	Percent of Demand Met  (By All CT Sources)
		From CT Colleges	From All CT Sources (Including ARC and Teach for America)		
<b>K-12/PK-12 Endorsements</b>					
Comprehensive special ed., K-12*	701	134	134	-567	19%
TESOL, PK-12*	62	15	15	-47	24%
Art, PK-12	128	23	26	-102	20%
Music, PK-12	135	53	61	-74	45%
Physical ed., PK-12	133	49	49	-84	37%
Technology ed., PK- 12*	64	9	14	-50	22%
<b>Elementary School Endorsement</b>					
Elementary school teachers	1065	488	538	-527	51%
<b>Secondary-Level Endorsements</b>					
Business, 7-12	25	5	5	-20	20%
World languages, 7- 12*	252	31	51	-201	20%
English, middle school	65	157	194	-129	298%
English, 7-12	326	154	184	-142	56%
History & social studies, middle school	15	120	125	110	833%
History & social studies, 7-12	174	119	124	-50	71%
Mathematics, middle school	50	85	111	61	222%

**Table 1: Educator Occupations’ Estimated Balance of Graduates and Job Openings, Fall 2014**

Position	Demand: Total Positions to Fill (For Fall 2014)	Supply: Newly Certified Educators With Endorsement* (2014)		Difference: Shortfall (-) or Surplus (All CT sources)	Percent of Demand Met  (By All CT Sources)
		From CT Colleges	From All CT Sources (Including ARC and Teach for America)		
Mathematics, 7-12*	350	82	104	-246	30%
Science, middle school	29	104	163	134	562%
Science, 7-12 <sup>1*</sup>	299	103	162	-137	54%
Middle school core subjects combined <sup>2</sup>	159	466	593	434	373%
7-12 core subjects combined	1149	458	574	-575	50%
<b>Other Educator Positions</b>					
Intermediate administrator*	364	432	432	68	119%
Library media specialist*	93	5	5	-88	5%
School counselor	150	59	59	-91	39%
Speech and language pathologist*	122	42	42	-80	34%

Notes:

\*Indicates 2014-15 academic year shortage area. CSDE annually designates ten endorsements that it believes will be under-produced as shortage areas for the upcoming school year.

<sup>1</sup> Includes Biology, Chemistry, Earth Science, General Science, and Physics.

<sup>2</sup> Core subjects are: English, History and Social Studies, Mathematics, and Science.

Source: Sources: PRI staff analysis of information provided by CT State Department of Education (CSDE) and of CSDE’s October 2015 “Data Bulletin: Public School Hiring Trends and Certification Subject Shortage Areas for 2015-16,” accessible on January 13, 2015 at: <http://www.sde.ct.gov/sde/lib/sde/pdf/evalresearch/databulletinOct2015.pdf>. In addition, CSDE’s May 2014 “Data Bulletin: Public School Hiring Trends and Certification Subject Shortage Areas for 2014-15” provided the 2014-15 shortage areas.

**Table 2: Educator Graduates from Connecticut Colleges, 2014 Calendar Year**

Position	Supply from CT Colleges	Share of Newly Certified (CT First-Time Certification) from CT Colleges	
		Public Colleges	Independent Colleges
<b>K-12/PK-12 Endorsements</b>			
Comprehensive special ed., K-12*	134	56%	44%
TESOL, PK-12*	15	33%	67%
Art, PK-12	23	100%	0%
Music, PK-12	53	57%	43%
Physical ed., PK-12	49	100%	0%
Technology ed., PK-12*	9	100%	0%
<b>Elementary School Endorsement</b>			
Elementary school teachers	488	46%	54%
<b>Secondary-Level Endorsements</b>			
Business, 7-12	5	0%	100%
World languages, 7-12*	31	61%	39%
English, middle school	157	51%	49%
English, 7-12	154	52%	48%
History & social studies, middle school	120	63%	37%
History & social studies, 7-12	119	64%	36%
Mathematics, middle school	85	54%	46%
Mathematics, 7-12*	82	56%	44%
Science, middle school	104	64%	36%
Science, 7-12* <sup>1</sup>	103	65%	35%
Middle school core subjects combined <sup>2</sup>	466	58%	42%
7-12 core subjects combined	458	59%	41%
<b>Other Educator Positions</b>			
Intermediate administrator*	432	45%	55%
Library media specialist*	5	100%	0%
School counselor	59	68%	32%
Speech and language pathologist*	42	100%	0%

---

Notes:

\*Indicates 2014-15 academic year shortage area. CSDE annually designates ten endorsements that it believes will be under-produced as shortage areas for the upcoming school year.

<sup>1</sup> Includes Biology, Chemistry, Earth Science, General Science, and Physics.

<sup>2</sup> Core subjects are: English, History and Social Studies, Mathematics, and Science.

Source: PRI staff analysis of data provided by CSDE.

## Legislative Program Review and Investigations Committee

### Senate Members

John W. Fonfara, *Co-Chair*  
John A. Kissel  
Eric D. Coleman  
Anthony Guglielmo  
Joe Markley  
Andrew Maynard

### Connecticut General Assembly

State Capitol Room 506  
Hartford, CT 06106  
Phone (860) 240-0300  
Facsimile (860) 240-0327  
[www.cga.ct.gov/pri/index.asp](http://www.cga.ct.gov/pri/index.asp)

### House Members

Christie M. Carpino, *Co-Chair*  
Mary M. Mushinsky  
Whit Betts  
Henry Genga  
Philip Miller  
Cara Pavalock

## STUDY SCOPE

### Apprenticeship Programs and Workforce Needs

#### Focus

The study will examine the effectiveness of Connecticut apprenticeship programs in meeting workforce demand. The study will analyze the alignment of supply (i.e., apprenticeship program graduates obtaining a license) and demand (job openings by trade). The various types of apprenticeship programs offered will be inventoried and described, including the programs' entry and completion requirements.

In addition, the study will update certain information contained in the 2009 PRI committee study entitled *Alignment of Postsecondary Education and Employment*. Specifically, figures that provided a broad view of projected graduate supply and employer demand in certain selected occupations requiring a postsecondary education will be updated to determine if changes in alignment have occurred.

#### Background

According to the U.S. Department of Labor's (U.S. DOL) Office of Apprenticeship, Training, Employer, and Labor Services, "Registered Apprenticeships are innovative work-based learning and post-secondary earn-and-learn models that meet national standards for registration." The registration is with the U.S. DOL or a federally-recognized state agency (e.g., a state department of labor).

Registered Apprenticeship (called "apprenticeship" for the remainder of this document) training is distinguished from other types of workplace training by several factors:

1. participants who are newly hired (or already employed) earn wages from employers during training;

2. programs must meet national standards for registration with the U.S. Department of Labor (or federally-recognized state agencies);
3. programs provide on-the-job learning and job-related technical instruction;
4. on-the-job learning is conducted in the work setting under the direction of one or more of the employer's personnel; and
5. training results in an industry-recognized credential.

Apprentices start working from day one with incremental wage increases as they become more proficient on the job. Apprenticeships range from one to six years, but the majority are four years long. According to a 2013 PRI study, upon program completion, almost all apprentices (91 to 98 percent) in Connecticut were subsequently hired as journeymen.<sup>1</sup>

There were 1,515 Connecticut employers sponsoring apprenticeship programs in FY 14, with more than 4,635 individuals actively enrolled in these programs.<sup>2</sup> The trades with the most apprentices in 2013 were electrician (1,515 apprentices), heating and cooling mechanic (472), plumbing mechanic (463), and limited heating and cooling (416), according to the Connecticut Department of Labor (CT DOL).

In Connecticut, apprenticeship programs are overseen by CT DOL's Office of Apprenticeship Training. The office, which has ten staff, is funded by the state and federal governments, as well as by program participants (both employers and apprentices).<sup>3</sup>

## **Areas of Analysis**

### Apprenticeship Programs

1. Describe the apprenticeship system in Connecticut, including the roles of CT DOL, trade unions, participating employers, and educational institutions
2. Evaluate how apprenticeship opportunities are made known to potential participants, both employers and workers
3. Develop an inventory of apprenticeship programs available in Connecticut
4. Using the inventory, compare and analyze apprenticeship programs, including but not limited to:
  - a. types and number of positions offered;
  - b. demand among potential apprentices;
  - c. length;
  - d. sponsorship;

---

<sup>1</sup> Includes those hired by either the employer who provided the on-the-job training or another employer. (PRI Committee, *Reemployment of Older Workers*, 2013.)

<sup>2</sup> FYs 2016-17 Biennium Governor's Budget.

<sup>3</sup> Ibid.

---

- e. cost;
  - f. entry and completion requirements;
  - g. participant number and demographics;
  - h. wages earned from entry through completion;
  - i. coursework cost and availability of academic credit;
  - j. completion rates;
  - k. post-completion employment rates; and
  - l. availability of career pathways.
5. Examine historical trends in Connecticut apprenticeship programs, including the number and types of programs, employer participation, and enrollment
  6. Compare Connecticut's apprenticeship opportunities to those in similar states

Update Supply and Demand Alignment

7. Update the alignment assessment of supply and demand for the occupations in the 2009 PRI committee study *Alignment of Postsecondary Education and Employment*, using the most recent data available

**Area Not Under Review**

The study would not review unregistered apprenticeship programs.

**PRI Staff Contacts**

Maryellen Duffy: [Maryellen.Duffy@cga.ct.gov](mailto:Maryellen.Duffy@cga.ct.gov)

Janelle Stevens: [Janelle.Stevens@cga.ct.gov](mailto:Janelle.Stevens@cga.ct.gov)



## Agency Response



January 21, 2016

The Honorable John Fonfara, Senate Co-chair  
The Honorable Christie Carpino, House Co-chair  
Program Review and Investigations Committee  
State Capitol, Room 506  
Hartford, CT 06106

Dear Senator Fonfara and Representative Carpino:

Thank you for the opportunity to provide comments to you and members of your Committee regarding the **Apprenticeship Programs and Workforce Needs – Staff Findings and Recommendations Final Report: Approved December 16, 2015**. The report contains several positive and worthwhile recommendations that deserve additional study and/or implementation. The report also contains several recommendations that the Department of Labor (DOL) will continue to monitor as any legislative proposal develops. However, there is one recommendation that the DOL would oppose which needs to be brought to the attention of committee members. In addition, the report contains some factual errors which will be provided separately from this document as requested by PRI staff.

As the PRI staff recommends, a reworking of the apprenticeship unit website is desirable. The Department also agrees that additional marketing of apprenticeship to potential sponsors and apprentices is vital.

The report recommends use of the federal apprenticeship data system by summer of 2016 and relying upon the representations of the U. S. Department of Labor staff, such a transition to the federal system would be "relatively easy". DOL staff will research the feasibility of utilizing the federal system. A major issue will be whether the federal system will permit the tracking of fees received and renewals, as DOL's system also serves as a financial management system. Further, there are certain trades that are recognized in Connecticut that are not recognized by the federal system. Therefore, an analysis must be done to determine whether the federal system meets Connecticut's needs and whether transferring to the federal data system will be efficient.

The report also contains a recommendation that DOL consider the 45-day window for sponsors to register apprentices that is allowed under federal regulations. While DOL understands the potential benefit of this timeframe, there are Department of Consumer Protection (DCP) statutes that permit the assessment of penalties, without a specified grace period, for an employer utilizing unregistered individuals. Therefore, additional research needs to be done.

The DOL also appreciates the recommendation for a higher level of apprentice involvement in the renewal process. This is sensible and ensures that the apprentice is aware of the renewal and the ramifications of the failure to obtain that renewal.

DOL must oppose the recommendation that the apprenticeship unit should “shift activities away from in-person apprenticeship registration and toward sponsor monitoring.” The apprenticeship system should be a system that provides adequate support and education to both parties to the apprenticeship agreement. Therefore, while it may be advisable to spend more time with sponsors, it is also necessary to proceed with in-person meetings with apprentices, at least for the first time an individual is registering as an apprentice. Many apprentices benefit from and appreciate the one-on-one discussions with apprenticeship unit staff. In addition, many of our apprentices are veterans who are seeking employment through the use of their military training and require specialized review of their military records and qualifications. Doing away with in-person apprenticeship registration would be a disservice to apprentices.

The staff of DOL’s apprenticeship unit has always provided technical assistance to sponsors and will continue to do so. That, in conjunction with the recommended monitoring, should ensure the continuing effectiveness of the system.

The success of our in-person apprenticeship registration process is clear because, as PRI staff states in the report, “Connecticut has more apprentices, on a per capita basis, than nearly all states.” In addition, PRI staff also reported that “Connecticut also has more active sponsors (1,568) than the nearby states examined...” The hard work of the apprenticeship unit staff should also be credited with these high numbers.

Thank you again for this opportunity, and please feel free to contact me at (860) 263-6510 if you have further questions.

Sincerely,



Dennis C. Murphy  
Acting Commissioner

