

**Connecticut Department of Labor (CTDOL)**  
**Report to the Education, Higher Education and Employment Advancement and  
Labor and Public Employees Committees**  
**Economic Outlook and Prospects for Vocational-Technical Related Occupations**



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## I. SUMMARY

Connecticut is in its 94<sup>th</sup> month of recovery since the recession of 2008-2010. On an annual basis, employment growth has been moderate and steady since 2010 – though Connecticut has lagged behind the U.S. on average. Private sector growth has been stronger than overall growth as job losses in the government sector have offset some of the private sector gains. In the past year, growth has been mixed with construction, information, leisure and hospitality and government down in the last 12 months. However, as of December 2017, all other major economic sectors have shown at least some employment growth in the last 12 months. This includes manufacturing which last peaked in 1967 and has shown no annual growth since 1980. Our preliminary figures show manufacturing up by 4,100 jobs from December 2016. Our short-term projection for employment growth through 2019 calls for a conservative growth rate of 1.1 percent over the two-year period 2017-2019, however, more recent data indicates that manufacturing may be creating jobs at a faster pace. Incomes have been slow to recover since the recession. As of December 2017, average weekly earnings are up 1.7 percent over the year. The slow growth in income and wages until recently is partly due to the natural demographic phenomena of larger numbers of retirees being replaced by younger age cohorts early in their earnings path.

The CT Department of Labor (CTDOL) undertakes an annual examination of occupations served by education programs provided by the vocational high school system. The agency examines growth patterns in those occupations in the state which require a high school diploma as a minimum entry requirement. CTDOL also looks at the balance in the number of graduates from education programs provided by the vocational education system and the demand for new entrants into the occupations these programs are designed to serve. Finally, CTDOL looks at a broader spectrum of occupations which require a high school diploma as a minimum requirement for entry, but for which there is no current high school level training available. These occupations may provide future opportunities for expansion of vocational high school education programs.

In general, this analysis indicates that the educational programs offered by the vocational high school system are in good alignment with the apparent demand for new entrants into the occupations they are designed to service. There are very few cases where, based on Training and Education Planning System (TEPS) analysis, vocational programs appear to be producing candidates for jobs that may not exist.

Based on TEPS data, CTDOL recommends that further research be done regarding the demand for automotive technology, computer installation and repair technology, and electrician programs to assure those fields are not being “over supplied.” **We caution that the TEPS program used to identify supply and demand imbalances should be used as a preliminary indicator only. There are other possible explanations for apparent imbalances that our current data can’t address.**

## II. Introduction

According to Sec 10-95h of the Connecticut General Statutes:

“The Labor Commissioner shall submit the following to the joint standing committees of the General Assembly having cognizance of matters relating to education, higher education and employment advancement and labor: (A) Information identifying general economic trends in the state; (B) occupational information regarding the public and private sectors, such as continuous data on occupational movements; and (C) information identifying emerging regional, state and national workforce needs over the next thirty years.”

This report seeks to address these requirements.

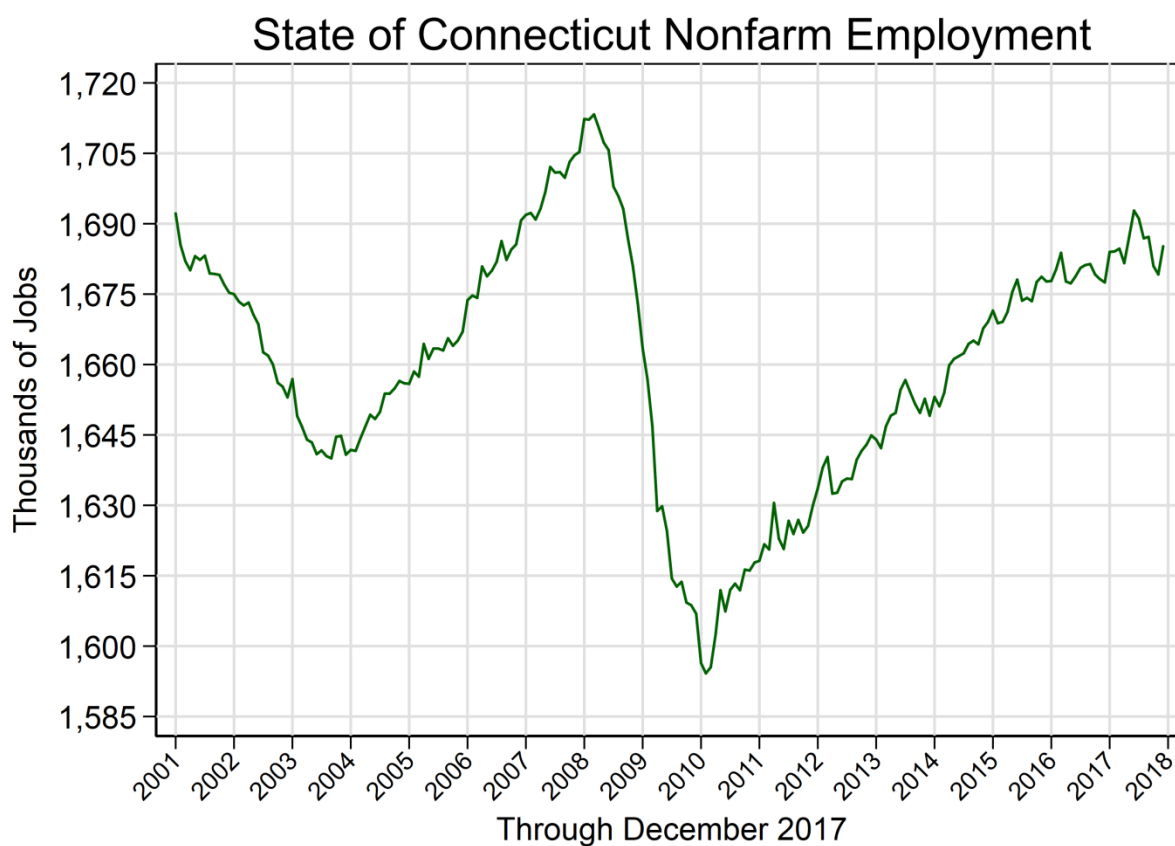
It should be noted that limitations on the data collected by the Department of Labor make full compliance with parts B) and C) above problematic. CTDOL conducts long-term occupational projections every two years with funding from the U.S. Department of Labor Education and Training Administration (USDOL / ETA). Our contracted deliverable mandates that CTDOL follow methods used by all states. We currently have occupational projections for the 2014–2024 ten-year period. The next round of projections will be completed by July 1, 2018, covering the period 2016–2026. Given long-term changes in technology, consumer tastes and economic conditions, thirty-year occupational projections would not generate meaningful results.

The foundation of CTDOL occupational projections is our Occupational Employment Statistics (OES) program, used to produce annual estimates of employment and wages earned by occupation in Connecticut. As currently designed by the USDOL Bureau of Labor Statistics, the sample design for the OES program does not permit its use as a “time-series,” i.e. the comparisons of employment by occupation from one year to the next are not statistically valid. The data are best interpreted as “snapshots” in time. As a result, meeting the part B) condition to present “continuous data” on movements in occupational demand is not strictly possible.

### III. Current Outlook for CT Economy and Labor Markets

Connecticut's recovery from the recession of 2008–2010 has been relatively slow as compared to U.S. averages. However, job growth in the state remains on a moderate growth trajectory (See FIGURE 1).

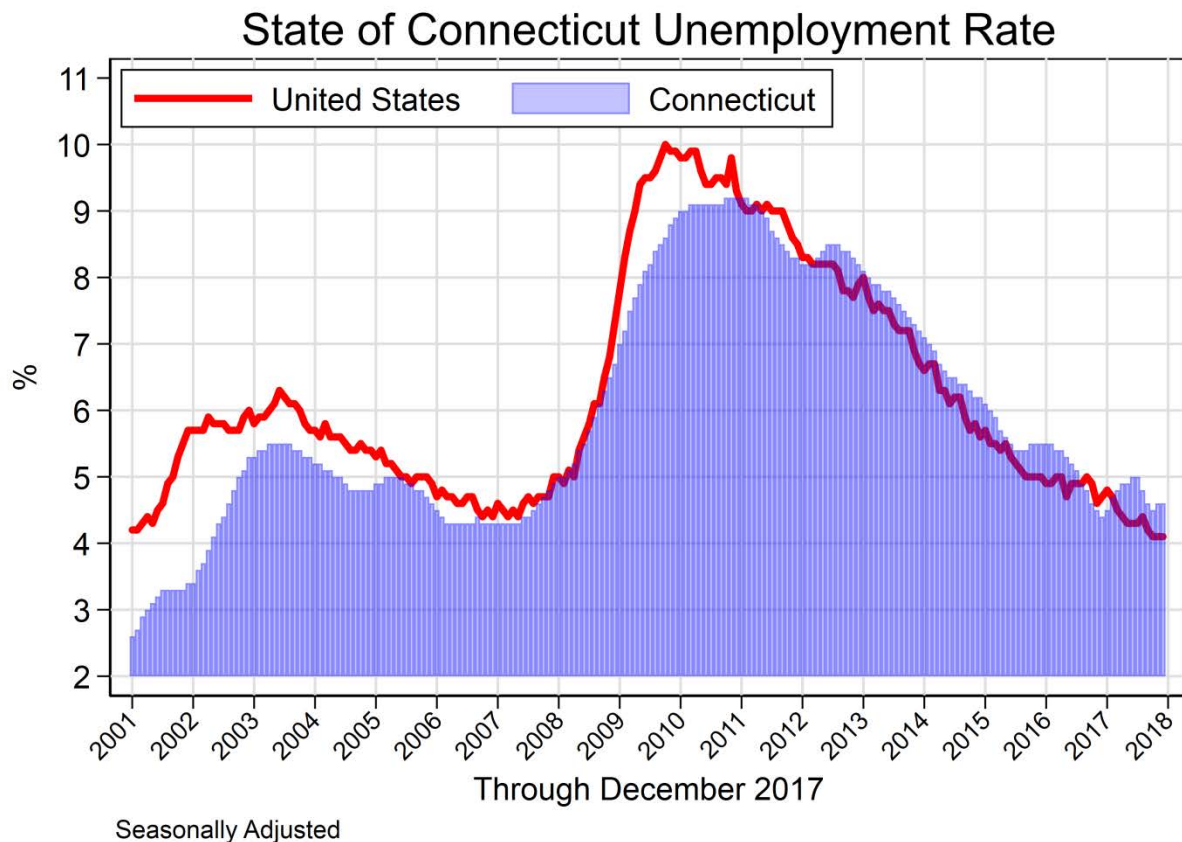
**FIGURE 1:**



**SEE appendix for annual average Total Non Farm and Private Sector growth**

As of December 2017, Connecticut recovered about 91 thousand, or 76 percent, of the jobs lost since the bottom of the recession in the first quarter of 2010. Connecticut's unemployment rate remained higher than the national average through most of 2017. This is partly due to the state's moderate employment growth rate, but also to more people returning to the labor force because they see opportunity for employment (see FIGURE 2).

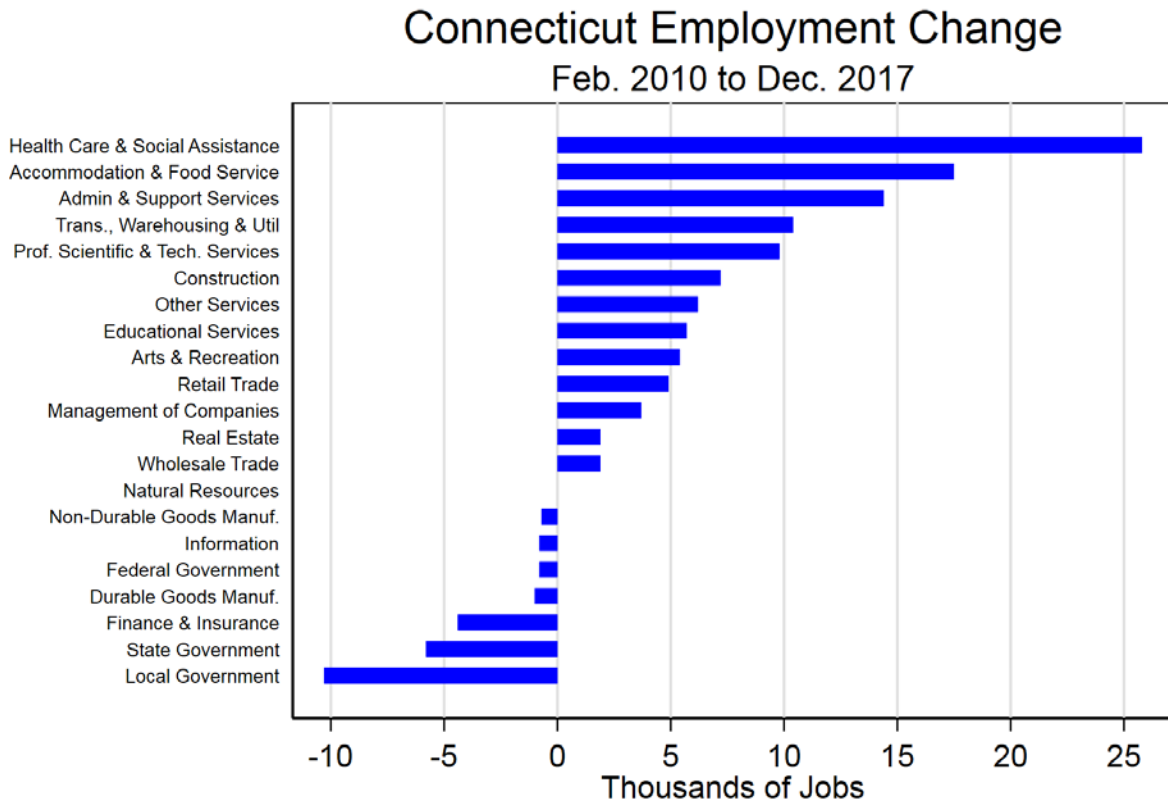
FIGURE 2:



#### WHAT DOES THE RECOVERY LOOK LIKE? WHERE ARE WE GAINING AND LOSING?

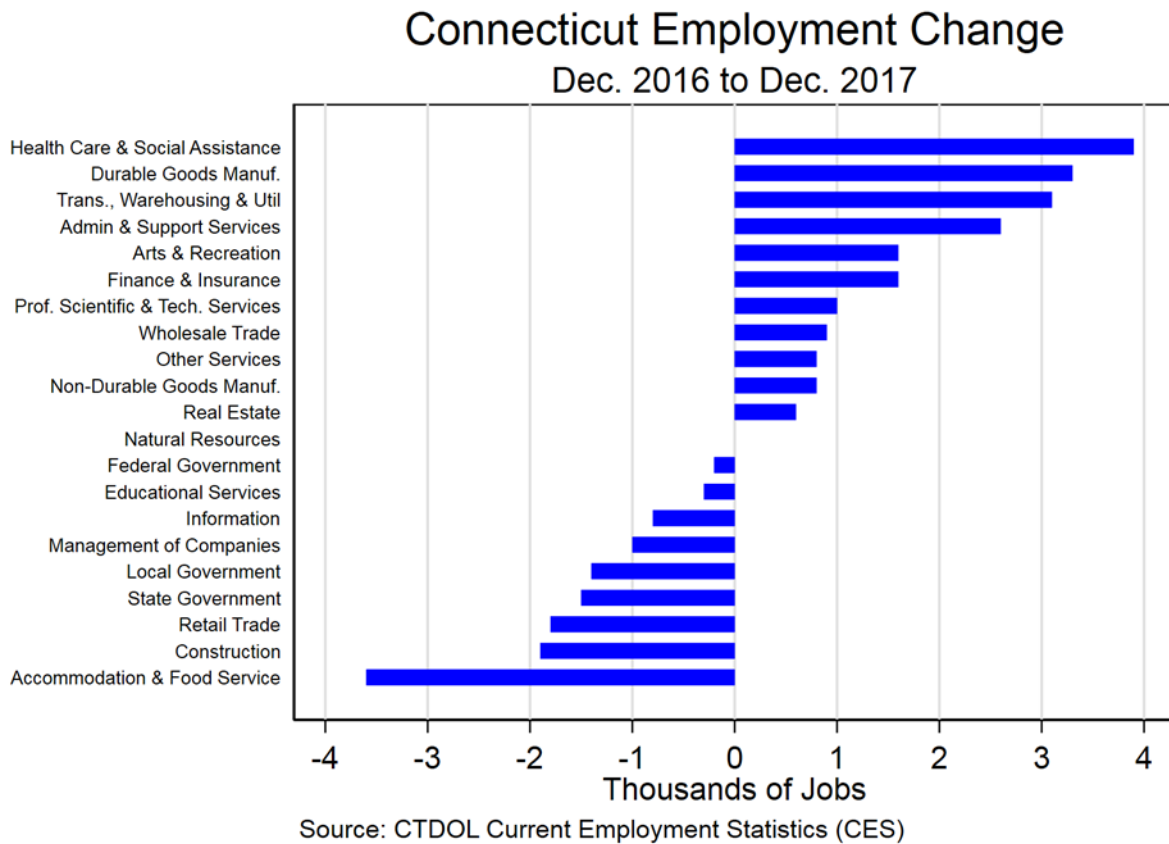
To date, the jobs recovery in Connecticut has occurred across most industries with some important exceptions. Job growth in the public sector, particularly at the state and local level, continues to drag on growth in the state. Since the withdrawal of federal stimulus funds, state and local governments have little choice but to slow hiring, and jobs continue to shrink. Manufacturing & Finance and Insurance employment remain below their levels when the recession ended but have increased in the past year. In recent years, manufacturing employment has declined in Connecticut, more as a factor of productivity and a shift toward advanced manufacturing, rather than a decline in the importance of this industry in the state. Even in a low employment growth environment, there is great opportunity and challenge in Connecticut manufacturing labor markets. The average age of the skilled manufacturing workforce is much higher than the workforce as a whole. Even in an environment where little net growth in total manufacturing employment is predicted, we do forecast reasonably strong annual demand to replace retiring workers. In addition, we expect the recent expansion to continue, driven by growth in transportation equipment manufacturing – which includes both aerospace and shipbuilding.

FIGURE 3a:



Source: CTDOL Current Employment Statistics (CES)

**FIGURE 3b:**



A continuing concern is the slow recovery of financial sector jobs, both in banking and in our historically important insurance industry. Even after the recession ended, the banking industry was hit hard by declines in both hedge funds and banking. The insurance industry continued to suffer from a decline in profitability (excepting healthcare) and continued restructuring where key activities such as IT services were outsourced. More recently, the job growth picture has improved. Job losses in the banking sector stopped in 2017 and there was growth in both employment in the investment activities as well as insurance.

**Table 1: Connecticut Industry Sector Employment Growth December 2016 – December 2017**

	Year to Year			
	Dec. 2017	Dec. 2016	Change	Rate %
Connecticut Nonfarm Employment	1,685,200	1,677,500	7,700	0.5%
Private Sector	1,454,400	1,443,600	10,800	0.7%
Construction	56,100	58,000	-1,900	-3.3%
Manufacturing	160,300	156,200	4,100	2.6%
Trade, Transportation & Utilities	300,300	298,100	2,200	0.7%
Information	31,100	31,900	-800	-2.5%
Financial Activities	132,400	130,200	2,200	1.7%
Professional and Business Services	219,000	216,400	2,600	1.2%
Leisure and Hospitality	153,300	155,300	-2,000	-1.3%
Other Services	66,400	65,600	800	1.2%
Government	230,800	233,900	-3,100	-1.3%
United States Nonfarm Employment	147,380,000	145,325,000	2,055,000	1.4%

Source: CTDOL Current Employment Statistics Program

**SHORT-TERM EMPLOYMENT OUTLOOK**

Connecticut is expected to continue on its modest job growth path through 2019 with one important exception. The average annual growth rate is expected to be 0.7% percent annually through the second quarter of 2019. This will potentially bring the employment level to 1,704,292 by the third quarter of 2019.

An important change to recent growth trends is manufacturing. Preliminary data indicate a strong finish for manufacturing employment in 2017, reversing a long-term trend of contraction. Our latest short-term projections call for 1.1% growth for the two years ending in Q2 2019. Particular strength is forecast for the Transportation Equipment industry which includes Aerospace and Shipbuilding. Construction has a brighter outlook, as it is projected to grow 1.5% over the two year forecast period. Construction trades will be the leader in this industry. Growth in this sector may slow if a delay in scheduled transportation projects continues.

Growth in Wholesale Trade and Transportation and Warehousing is expected to offset a declining retail sector. Warehousing and Storage (including distribution and fulfillment centers) will be especially important. Health Care and Social Assistance should see renewed growth, even after the impact of hospital consolidation in the state. We expect Leisure and Hospitality employment to continue to grow at recent trend rates despite an apparent slowdown in the last two Quarters of 2017.

Demographics will drive a slowing of the Education sector in the state, which previously grew throughout the recessionary period and recovery. We also expect to see declines in the Finance and Insurance sector led by declines in Banking and Insurance.

**Table 2: Short Term Industry Employment Forecast – Connecticut Payroll Jobs Q2 2017 – Q2 2019 (preliminary data)**

Industry	2017 Employment	2019 Projected Employment	Avg. Annual Growth Rate
<b>Total All Industries</b>	<b>1,682,066</b>	<b>1,704,292</b>	<b>0.7%</b>
Goods Producing	223,668	226,147	0.6%
Natural Resources and Mining	5,694	5,572	-1.1%
Construction	59,354	60,232	0.7%
Manufacturing	158,620	160,343	0.5%
Services Providing	1,457,779	1,478,146	0.7%
Trade, Transportation, and Utilities	304,178	305,088	0.1%
Information	31,637	31,078	-0.9%
Financial Activities	126,389	125,243	-0.5%
Professional and Business Services	219,680	228,033	1.9%
Education and Health Services	462,652	469,723	0.8%
Leisure and Hospitality	172,786	177,006	1.2%
Other Services (except Government)	64,628	66,652	1.6%
Government	75,830	75,323	-0.3%

#### **IV. Demand for Occupations Relevant to the Vocational Education System (requiring High School or postsecondary education)**

##### **LONG-TERM INDUSTRY/OCCUPATIONAL-EMPLOYMENT FORECAST PROCESS:**

The long-term projections are produced on a two-year cycle and look forward 10 years. The most recent 10-year projections are for the period 2014-2024 and were completed in the summer of 2016. The 2016-2026 projections are scheduled to be completed by June 30, 2018.

Every quarter, Connecticut employers report employment levels and wages to the Connecticut Department of Labor as part of the Unemployment Compensation Insurance system. This data allows the Office of Research to accurately calculate employment levels for every industry in the state over time. For most industries, we have complete and consistent data back to 1990. This data is used as a foundation to produce the long-term projections of Connecticut employment by industry, based on trends in the data and other factors. These other factors include the national projections for employment by industry, independent demographic forecasts, and independent forecasts of other factors that could affect employment in Connecticut. For example, there are independent forecasts of

capital investment by the U.S. Department of Defense. They are used to develop employment projections for those Connecticut industries affected by changes in defense capital spending.

The long-term industry projections are produced with the assumption that the economy will have full employment at the end of the projection period. The “full employment” assumption is made because predicting the timing of the business cycle over a ten-year period is difficult, if not impossible, and would severely complicate the use of this data for planning purposes.

### **LONG-TERM OCCUPATIONAL FORECASTS**

The Occupational Employment Statistics (OES) program conducted in partnership with the USDOL Bureau of Labor Statistics develops staffing patterns for each industry based on a survey of 21,000 establishments. These staffing patterns are combined with the industry data to produce the estimates of employment by occupation for the base year. Occupational employment projections are based on both the industry projections and change factors which estimate the portion of employment each occupation is expected to gain or lose within each industry. Finally, the number of projected openings is computed based on the change in the level of employment, plus an occupation-specific measure of expected turnover.

Growth in employment for an industry or occupation can occur for two reasons. First, the demand for labor can increase because the industry itself is expanding, requiring more labor. Second, there can be demand for new positions in an industry or occupation for demographic reasons, i.e. to replace retiring workers or replace workers who leave a position to take a new job – leaving a vacancy behind. This type of annual demand is called replacement demand. Because of the need for replacements, there can be significant demand for new workers even in cases where the industry itself is not growing. In addition, we would expect high replacement demand in industries and occupations that have traditionally high turnover or “churn.” For example, we can expect a reasonably high annual demand for skilled replacement manufacturing occupations even though manufacturing is not projected to see an increase in overall employment levels over the next ten years. The average age of manufacturing workers in Connecticut is considerably higher than the average age of all of Connecticut’s workers. As a result, many of those manufacturing workers are close to retirement.

Our occupational projections distinguish between the annual projected demands for openings due to growth from those due to replacement needs.

The tables below present the estimated annual occupational demand for new job openings over the period 2014–2024. *To be of greater use to the Vocational Education system, these tables focus on those occupations that require either a high school education or postsecondary certificate as minimum level entry requirements.* Occupations which require either less than a high school degree level of education or college preparation are not included. Vocational high school training may not be relevant to all these occupations. Rankings are presented by all projected annual openings and separately by those occupations projected to be fastest growing. For contrast purposes, those occupations in greatest decline are also presented.

**TABLE 3: Top 100 CT Occupations which Require a High School Degree or Postsecondary Award  
(Ranked by Annual Projected Openings due to Growth through 2024)**

SOURCE: CTDOL Occupational Projections program 2014-2024

	Projected Employment 2024	Annual Growth Openings	Annual Total Openings	Median Annual Wage	Minimum Education	Required Work Experience	On Job Training
Occupational Title							
Customer Service Representatives	32,242	247	980	38,509 HS	None	ST	
Childcare Workers	20,210	222	753	22,852 HS	None	ST	
First-Line Supervisors of Office and Administrative	27,038	156	541	60,674 HS	< 5 Yrs.	None	
Medical Assistants	8,486	124	275	34,865 PS	None	None	
Nursing Assistants	24,059	123	639	31,357 PS	None	None	
Carpenters	16,315	121	295	51,785 HS	None	APP	
Machinists	8,644	111	329	46,628 HS	None	LT	
Receptionists and Information Clerks	14,288	106	462	32,962 HS	None	ST	
Electricians	9,107	103	226	56,623 HS	None	APP	
Social and Human Service Assistants	9,089	100	259	38,216 HS	None	ST	
Bus Drivers, School or Special Client	10,202	94	216	34,637 HS	None	ST	
Sales Representatives, Wholesale and Manufactu	16,924	93	422	63,280 HS	None	MT	
Hairdressers, Hairstylists, and Cosmetologists	11,154	88	352	25,942 PS	None	None	
Sales Representatives, Services, All Other	10,575	81	289	59,651 HS	None	MT	
Office Clerks, General	34,770	81	813	35,879 HS	None	ST	
Licensed Practical and Licensed Vocational Nurse	9,594	75	327	56,548 PS	None	None	
First-Line Supervisors of Food Preparation and Se	8,999	71	317	33,672 HS	< 5 Yrs.	None	
Maintenance and Repair Workers, General	11,274	70	347	44,206 HS	None	LT	
First-Line Supervisors of Construction Trades and	7,973	67	125	73,058 HS	5+ Yrs.	None	
Plumbers, Pipefitters, and Steamfitters	6,377	66	142	58,565 HS	None	APP	
Secretaries and Administrative Assistants, Excep	34,336	63	418	42,019 HS	None	ST	
Computer-Controlled Machine Tool Operators, Met	3,261	60	141	44,852 HS	None	MT	
Billing and Posting Clerks	6,137	57	173	43,779 HS	None	MT	
Medical Secretaries	4,837	57	102	39,921 HS	None	MT	
Light Truck or Delivery Services Drivers	12,117	55	252	33,547 HS	None	ST	
Team Assemblers	10,013	52	256	30,224 HS	None	MT	
Industrial Machinery Mechanics	2,895	51	113	53,753 HS	None	LT	
Self-Enrichment Education Teachers	3,992	49	115	41,665 HS	< 5 Yrs.	None	
Insurance Sales Agents	8,253	49	253	57,649 HS	None	MT	
Office and Administrative Support Workers, All Ot	6,295	49	205	20,477 HS	None	ST	
Heavy and Tractor-Trailer Truck Drivers	14,596	49	289	46,536 PS	None	ST	
Massage Therapists	2,775	46	63	45,970 PS	None	None	
Residential Advisors	2,339	40	99	28,389 HS	None	ST	
Dental Assistants	4,204	38	132	42,288 PS	None	None	
Security Guards	11,795	37	198	27,523 HS	None	ST	
Emergency Medical Technicians and Paramedics	3,608	36	89	44,800 PS	None	None	
Fitness Trainers and Aerobics Instructors	4,905	36	120	44,124 HS	None	ST	
Recreation Workers	5,520	36	131	26,615 HS	None	ST	
Production, Planning, and Expediting Clerks	4,827	34	156	49,407 HS	None	MT	
Assemblers and Fabricators, All Other	3,666	33	105	33,113 HS	None	MT	
Property, Real Estate, and Community Associatio	4,180	32	99	62,987 HS	< 5 Yrs.	None	
Inspectors, Testers, Sorters, Samplers, and Weig	8,213	32	230	43,984 HS	None	MT	
First-Line Supervisors of Retail Sales Workers	21,855	31	513	44,215 HS	< 5 Yrs.	None	
Heating, Air Conditioning, and Refrigeration Mecha	3,853	30	84	55,280 PS	None	LT	
Nonfarm Animal Caretakers	2,932	29	83	23,066 HS	None	ST	
Operating Engineers and Other Construction Equip	3,322	27	78	63,850 HS	None	MT	
First-Line Supervisors of Mechanics, Installers, an	4,674	27	115	69,651 HS	< 5 Yrs.	None	
Insurance Claims and Policy Processing Clerks	4,883	26	142	47,535 HS	None	MT	
Bus and Truck Mechanics and Diesel Engine Spe	2,661	26	67	53,348 HS	None	LT	
Real Estate Sales Agents	4,851	24	56	44,801 HS	None	MT	
First-Line Supervisors of Production and Operating	8,650	24	157	64,440 HS	< 5 Yrs.	None	

**TABLE 3: CONTINUED**

Occupational Title	Projected Employment 2024	Annual Growth Openings	Annual Total Openings	Median Annual Wage	Minimum Education	Required Work Experience	On Job Training
Automotive Service Technicians and Mechanics	10,133	23	288	42,244	PS	None	ST
Food Service Managers	5,654	20	130	54,811	HS	< 5 Yrs.	None
Chefs and Head Cooks	2,330	20	52	44,603	HS	5+ Yrs.	None
Pharmacy Technicians	3,741	19	54	31,774	HS	None	MT
First-Line Supervisors of Landscaping, Lawn Service, and Grounds Maintenance Workers	3,201	19	69	54,250	HS	< 5 Yrs.	None
Installation, Maintenance, and Repair Workers, All Other	3,224	19	65	40,090	HS	None	MT
Opticians, Dispensing	1,146	18	44	39,738	HS	None	LT
Psychiatric Aides	1,376	18	45	36,058	HS	None	ST
Physical Therapist Aides	830	18	37	29,552	HS	None	ST
Manicurists and Pedicurists	2,464	18	36	20,150	PS	None	None
First-Line Supervisors of Non-Retail Sales Workers	5,532	18	80	78,119	HS	< 5 Yrs.	None
Shipping, Receiving, and Traffic Clerks	7,323	18	173	34,599	HS	None	ST
Maintenance Workers, Machinery	1,354	18	37	48,464	HS	None	MT
Computer Numerically Controlled Machine Tool Programmers, All Other	1,031	18	44	55,845	HS	None	LT
Information and Record Clerks, All Other	1,729	17	57	40,770	HS	None	ST
Medical Records and Health Information Technicians	1,685	15	49	43,806	PS	None	None
Phlebotomists	1,792	15	49	37,730	PS	None	None
Brickmasons and Blockmasons	1,090	14	22	67,082	HS	None	APP
Telecommunications Equipment Installers and Repairers	2,615	14	36	58,607	PS	None	MT
Welders, Cutters, Solderers, and Brazers	2,448	14	80	42,606	HS	None	MT
Driver/Sales Workers	3,195	14	66	26,619	HS	None	ST
Claims Adjusters, Examiners, and Investigators	5,609	13	149	67,162	HS	None	LT
First-Line Supervisors of Housekeeping and Janitorial Workers	3,034	13	59	52,180	HS	< 5 Yrs.	None
Hotel, Motel, and Resort Desk Clerks	1,971	13	108	22,667	HS	None	ST
Automotive Body and Related Repairers	2,025	13	57	44,125	HS	None	LT
Multiple Machine Tool Setters, Operators, and Tenders, All Other	3,354	13	69	37,492	HS	None	MT
Ophthalmic Medical Technicians	823	12	19	41,574	PS	None	None
Health Technologists and Technicians, All Other	1,026	12	21	48,178	HS	None	None
Personal Care and Service Workers, All Other	1,237	12	37	26,992	HS	None	ST
Production Workers, All Other	2,015	12	51	30,878	HS	None	MT
Hazardous Materials Removal Workers	916	11	29	42,495	HS	None	MT
Audio and Video Equipment Technicians	1,233	10	32	49,162	PS	None	ST
Healthcare Practitioners and Technical Workers, All Other	869	10	25	51,800	PS	None	None
Demonstrators and Product Promoters	1,569	10	54	29,264	HS	None	ST
Dispatchers, Except Police, Fire, and Ambulance	1,917	10	56	39,911	HS	None	MT
Sheet Metal Workers	1,351	10	37	52,151	HS	None	APP
Outdoor Power Equipment and Other Small Engine Mechanics	914	10	26	44,964	HS	None	MT
Dental Laboratory Technicians	731	10	25	39,840	HS	None	MT
Painters, Transportation Equipment	714	10	22	58,764	HS	None	MT
Community Health Workers	790	9	23	39,433	HS	None	ST
Real Estate Brokers	1,773	9	21	65,605	HS	< 5 Yrs.	None
Helpers--Electricians	579	9	15	28,937	HS	None	ST
First-Line Supervisors of Transportation and Material Moving Workers	2,031	9	71	63,355	HS	< 5 Yrs.	None
Police and Sheriff's Patrol Officers	6,291	8	213	68,853	HS	None	MT
Security and Fire Alarm Systems Installers	716	8	24	55,189	HS	None	MT
Cabinetmakers and Bench Carpenters	972	8	15	44,627	HS	None	MT
Ophthalmic Laboratory Technicians	578	8	20	37,563	HS	None	MT
Transportation, Storage, and Distribution Managers	1,220	7	32	102,069	HS	5+ Yrs.	None
Library Technicians	1,743	7	87	40,113	PS	None	None
Veterinary Assistants and Laboratory Animal Care	1,047	7	27	27,880	HS	None	ST
Skincare Specialists	780	7	13	35,038	PS	None	None

**Table 3 Abbreviation Key:**

HS = High school diploma, PS = Post-secondary award  
 ST = Short-term on-the-job training (OJT), MT = medium-term  
 OJT, LT = Long-term OJT, APP = Apprenticeship

**Table 4: Bottom 50 CT Occupations which Require a High School Degree or Postsecondary Award  
(Ranked by Total Projected Annual Openings Through 2024)**

Occupational Title	Projected Employment 2024	Annual Growth Openings	Annual Total Openings	Median Annual Wage	Minimum Education	Required Work Experience	On Job Training
Control and Valve Installers and Repairers, Except	527	0	21	70,238	HS	None	MT
Home Appliance Repairers	464	0	13	39,392	HS	None	MT
Coin, Vending, and Amusement Machine Servicers	280	0	5	39,382	HS	None	ST
Locksmiths and Safe Repairers	156	0	9	48,625	HS	None	LT
Coil Winders, Tapers, and Finishers	219	0	3	34,654	HS	None	MT
Electrical and Electronic Equipment Assemblers	3,034	0	39	34,440	HS	None	MT
Electromechanical Equipment Assemblers	1,099	0	14	37,900	HS	None	MT
Food Cooking Machine Operators and Tenders	213	0	4	28,458	HS	None	MT
Extruding and Drawing Machine Setters, Operators	1,018	0	30	39,054	HS	None	MT
Forging Machine Setters, Operators, and Tenders	241	0	6	39,840	HS	None	MT
Rolling Machine Setters, Operators, and Tenders	289	0	8	40,473	HS	None	MT
Cutting, Punching, and Press Machine Setters, O	1,835	0	28	34,379	HS	None	MT
Drilling and Boring Machine Tool Setters, Operator	245	0	5	32,133	HS	None	MT
Grinding, Lapping, Polishing, and Buffing Machine	1,218	0	60	39,442	HS	None	MT
Lathe and Turning Machine Tool Setters, Operator	1,107	0	33	36,737	HS	None	MT
Milling and Planing Machine Setters, Operators, a	231	0	5	43,606	HS	None	MT
Model Makers, Metal and Plastic	100	0	2	50,476	HS	None	MT
Foundry Mold and Coremakers	66	0	1	35,042	HS	None	MT
Molding, Coremaking, and Casting Machine Sette	874	0	16	28,397	HS	None	MT
Tool and Die Makers	1,996	0	10	58,223	HS	None	LT
Welding, Soldering, and Brazing Machine Setters,	338	0	11	36,757	HS	None	MT
Heat Treating Equipment Setters, Operators, and	238	0	5	37,635	HS	None	MT
Layout Workers, Metal and Plastic	83	0	2	47,740	HS	None	MT
Plating and Coating Machine Setters, Operators, a	529	0	15	31,408	HS	None	MT
Tool Grinders, Filers, and Sharpeners	144	0	4		HS	None	MT
Metal Workers and Plastic Workers, All Other	229	0	5	38,166	HS	None	MT
Prepress Technicians and Workers	320	0	6	48,812	PS	None	None
Printing Press Operators	2,005	0	32	36,778	HS	None	MT
Print Binding and Finishing Workers	521	0	8	35,604	HS	None	ST
Textile Cutting Machine Setters, Operators, and T	55	0	1	28,264	HS	None	MT
Upholsterers	217	0	6	37,084	HS	None	MT
Textile, Apparel, and Furnishings Workers, All Oth	57	0	1	26,254	HS	None	ST
Sawing Machine Setters, Operators, and Tenders	181	0	5	34,144	HS	None	ST
Woodworking Machine Setters, Operators, and Te	271	0	5	36,818	HS	None	ST
Power Distributors and Dispatchers	106	0	4		HS	None	LT
Power Plant Operators	200	0	7	71,401	HS	None	LT
Chemical Plant and System Operators	287	0	11	63,644	HS	None	LT
Petroleum Pump System Operators, Refinery Ope	52	0	2	58,550	HS	None	LT
Crushing, Grinding, and Polishing Machine Setters	504	0	11	36,584	HS	None	MT
Cutting and Slicing Machine Setters, Operators, a	1,025	0	20	36,584	HS	None	ST
Extruding, Forming, Pressing, and Compacting M	376	0	15	33,685	HS	None	MT
Furnace, Kiln, Oven, Drier, and Kettle Operators a	87	0	2	34,144	HS	None	MT
Photographic Process Workers and Processing M	192	0	6	30,724	HS	None	ST
Adhesive Bonding Machine Operators and Tenders	97	0	3	38,298	HS	None	MT
Etchers and Engravers	150	0	4	31,949	HS	None	MT
Molders, Shapers, and Casters, Except Metal and	173	0	6	39,932	HS	None	LT
Paper Goods Machine Setters, Operators, and Te	795	0	13	44,402	HS	None	MT
Aircraft Cargo Handling Supervisors	56	0	2	48,695	HS	< 5 Yrs.	None
Ambulance Drivers and Attendants, Except Emerg	111	0	2	29,339	HS	None	MT
Transportation Inspectors	136	0	4	70,781	HS	None	MT
Transportation Attendants, Except Flight Attendar	50	0	1	21,740	HS	None	ST

SOURCE: CTDOL Occupational Projections program 2014- 2024

**Table 3 Abbreviation Key:**

HS = High school diploma, PS = Post-secondary award  
 ST = Short-term on-the-job training (OJT), MT = medium-term  
 OJT, LT = Long-term OJT, APP = Apprenticeship

## V. Workforce Alignment between Vocational Education System (requiring High School or postsecondary education) and Projected Occupational Demand

The CTDOL TEPS program tool attempts to compare the “pipeline” of education program completers in Connecticut to the estimated demand for new entrants into those occupations for which completers are being trained. TEPS uses program completer information from the Integrated Postsecondary Education Data System (IPEDS) and local education institutions and compares these values to CTDOL’s long-term estimates of annual demand for new entrants into an occupation. The results can be informative, but the limitations of the data and labor markets must be understood in order to properly use the information. These limitations include:

- The ONET (Occupational Information Network) crosswalk which relates education programs (classified by CIP – Classification of Instructional Program codes) to occupations (classified by SOC – Standard Occupational Codes) is “one to many” relationship in both directions. This means an educational program may train an individual for a number of occupations and an occupation may draw qualified entrants from a number of education programs. There is no reliable data available to apportion completers to each of its available occupations. **TEPS assumes that all completers of an education program could enter any of the occupations for which they qualify.**
- TEPS (or any state-based measure of labor supply and demand) assumes that labor markets begin and end at the state border. In fact, this is highly dependent on the occupation involved. Entrants to some new positions could come across state or international borders. Similarly, many trained in Connecticut could seek positions elsewhere.
- **The TEPS procedure recognizes, but can’t measure those who complete an education program and may not be directly entering the workforce.** A particular education program may be a useful stepping stone toward further education and career choices.

***As a result of these limitations, TEPS results that show a significant under or over supply of trained individuals for entry into an occupation should be taken as a preliminary indicator only. More analysis from those who are close to these professions is necessary to determine if too many or too few individuals are being trained for a particular occupation.***

For the case of vocational/technical education, TEPS filters out those completers of Bachelor’s and advanced degrees as well as those occupations which require higher levels of training. For high school education programs for which there are also Certificate and Associate degree programs, the completers are included, but accounted for separately. This is done because these high school programs may be the first step in a career pathway that requires higher levels of training.

**Table 5: Educational Programs provided by Connecticut High Schools and the Average Annual Openings for the Occupations they “supply.”**

Educational Program (CIP Title - Black Bold) Occupation (SOC Title - Blue Bold)	HS Degrees Awarded	Post Secondary Cert's Awarded	Associate Degrees Awarded	Batchelor Degreed Awarded	Total Completers	Total Projected Annual Openings	Projected Surplus or Deficit*
<b>Autobody/Collision and Repair Technology/Technician.</b>	108	61	0	0	169	90	-79
Automotive Body and Related Repairers	108	61	0	0		57	
Automotive Glass Installers and Repairers	108	61	0	0		6	
Insurance Appraisers, Auto Damage	108	61	0	0		5	
Painters, Transportation Equipment	108	61	0	0		22	
<b>Automobile/Automotive Mechanics Technology/Technician.</b>	246	540	24	0	810	294	-516
Automotive Service Technicians and Mechanics	246	540	24	0		288	
Electrical and Electronics Installers and Repairers, Transportation Equip	246	540	24	0		3	
Electronic Equipment Installers and Repairers, Motor Vehicles	246	540	24	0		3	
<b>Baking and Pastry Arts/Baker/Pastry Chef.</b>	15	33	0	0	48	756	708
Bakers	15	33	0	0		43	
Chefs and Head Cooks	15	33	0	0		52	
Cooks, Institution and Cafeteria	15	33	0	0		124	
Cooks, Restaurant	15	33	0	0		537	
<b>Carpentry/Carpenter.</b>	197	0	0	0	197	420	223
Carpenters	197	0	0	0		295	
Supervisors of Construction and Extraction Workers	197	0	0	0		125	
<b>Child Care Provider/Assistant.</b>	13	25	7	0	45	753	708
Childcare Workers	13	25	7	0		753	
<b>Computer Installation and Repair Technology/Technician.</b>	61	123	0	0	184	11	-173
Electrical and Electronics Repairers, Commercial and Industrial Equipme	61	123	0	0		11	
<b>Computer Numerically Controlled (CNC) Machinist Technology/CNC Mac</b>	11	244	0	0	255	185	-70
Computer Numerically Controlled Machine Tool Programmers, Metal a	11	244	0	0		44	
Computer-Controlled Machine Tool Operators, Metal and Plastic	11	244	0	0		141	
<b>Cosmetology, Barber/Styling, and Nail Instructor.</b>	213	0	0	0	213	352	139
Hairdressers, Hairstylists, and Cosmetologists	213	0	0	0		352	
<b>Cosmetology/Cosmetologist, General.</b>	0	418	0	0	418	401	-17
Hairdressers, Hairstylists, and Cosmetologists	0	418	0	0		352	
Manicurists and Pedicurists	0	418	0	0		36	
Skincare Specialists	0	418	0	0		13	
<b>Diesel Mechanics Technology/Technician.</b>	10	0	0	0	10	67	57
Bus and Truck Mechanics and Diesel Engine Specialists	10	0	0	0		67	
<b>Electrician.</b>	216	502	0	0	718	375	-343
Electricians	216	502	0	0		226	
Security and Fire Alarm Systems Installers	216	502	0	0		24	
Supervisors of Construction and Extraction Workers	216	502	0	0		125	
<b>Fashion Merchandising.</b>	38	1	5	11	55	422	367
Sales Representatives, Wholesale and Manufacturing, Except Technica	38	1	5	11		422	
<b>Health Information/Medical Records Technology/Technician.</b>	95	12	10	0	117	49	-68
Medical Records and Health Information Technicians	95	12	10	0		49	
<b>Heating, Ventilation, Air Conditioning and Refrigeration Engineering Tec</b>	129	78	0	0	207	84	-123
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	129	78	0	0		84	
<b>Mason/Masonry.</b>	45	0	0	0	45	152	107
Brickmasons and Blockmasons	45	0	0	0		22	
Supervisors of Construction and Extraction Workers	45	0	0	0		125	
Tile and Marble Setters	45	0	0	0		5	
<b>Plumbing Technology/Plumber.</b>	171	33	0	0	204	267	63
Plumbers, Pipefitters, and Steamfitters	171	33	0	0		142	
Supervisors of Construction and Extraction Workers	171	33	0	0		125	

**Table 5: Continued**

Educational Program (CIP Title - Black Bold) Occupation (SOC Title - Blue Bold)	HS Degrees Awarded	Post Secondary Cert's Awarded	Associate Degrees Awarded	Batchelor Degreed Awarded	Total Completers	Total Projected Annual Openings	Projected Surplus or Deficit*
<b>Welding Technology/Welder.</b>	20	134	0	0	154	91	-63
<b>Welders, Cutters, Solderers, and Brazers</b>	20	134	0	0		80	
<b>Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders</b>	20	134	0	0		11	
<b>Information Technology</b>	85	40	6	39	170	1044	874
<b>Computer and Information Systems Managers</b>	85	40	6	39		236	
<b>Computer Systems Analysts</b>	85	40	6	39		290	
<b>Software Developers, Applications</b>	85	40	6	39		323	
<b>Software Developers, Systems Software</b>	85	40	6	39		164	
<b>Computer Network Architects</b>	85	40	6	39		31	
* Negative value (-) indicates completers in excess of projected new annual openings							
Positive value (+) indicates projected new annual openings in excess of program completers.							

Source: CTDOL TEPS Program

Interpret **Table 5** above as follows. In **bold black** are the instructional programs offered by high schools in Connecticut in CIP (Classification of Instructional Programs) format. For each program, the number of 2016 program completers is listed along with the number of completers of Certificate programs, Associate degree programs and Bachelor's degrees in the same CIP category. **In blue**, below each CIP program are the occupations for which candidates should be qualified. A positive value in the "Projected Surplus or Deficit" column indicates there are more annual openings anticipated than trained program completers. A negative value indicates there are more candidates than estimated openings.

**Table 6** shows existing educational programs and their estimated occupational demand where there is apparent demand in excess of supply for occupations that require only a high school diploma as a minimum level entry requirement. In addition, there appears to be no current high school level training programs available.

**Table 6: Vocational Education Program Potential**

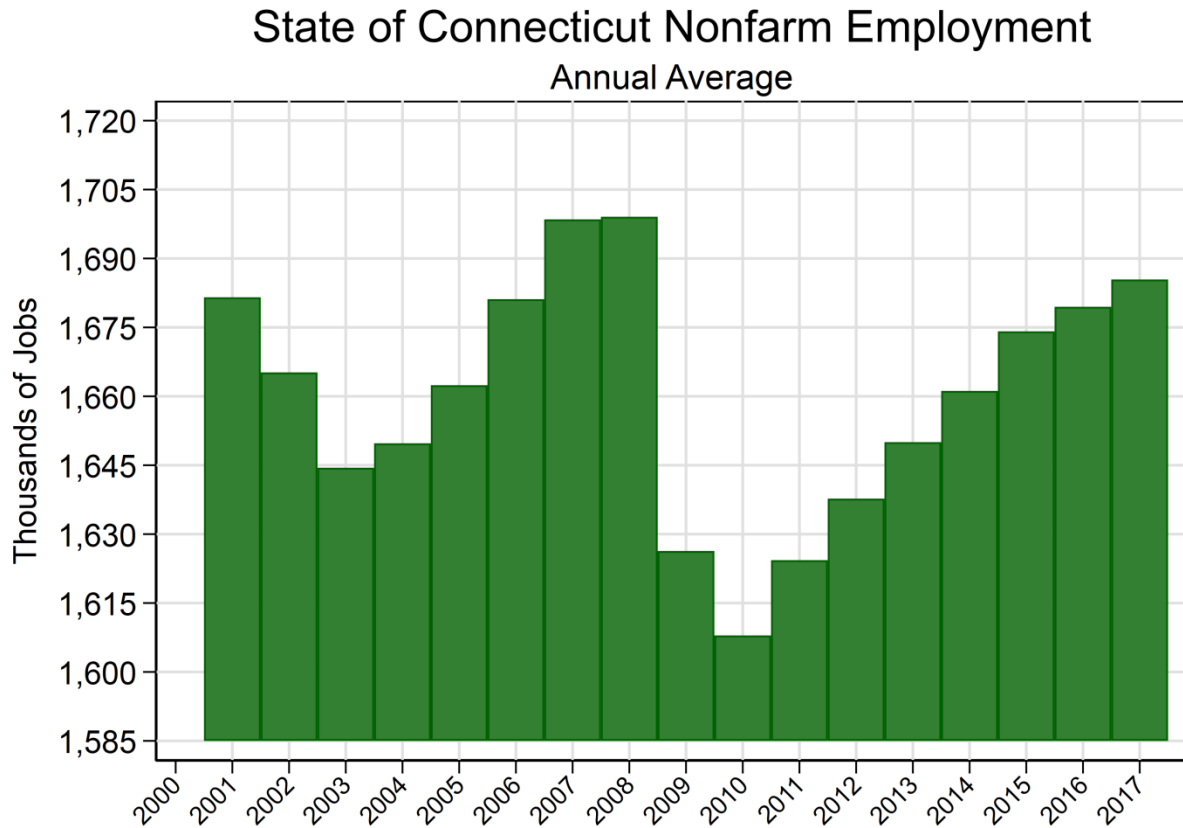
Educational Program (CIP Title - Black Bold) Occupation (SOC Title - Blue Bold)	HS Degrees Awarded	Post Secondary Cert's Awarded	Associate Degrees Awarded	Batchelor Degreed Awarded	Total Completers	Total Projected Annual Openings	Projected Surplus or Deficit
<b>Culinary Arts/Chef Training.</b>	0	91	15	0	106	1048	942
Chefs and Head Cooks	0	91	15	0		52	
Cooks, All Other	0	91	15	0		18	
Cooks, Institution and Cafeteria	0	91	15	0		124	
Cooks, Restaurant	0	91	15	0		537	
First-Line Supervisors of Food Preparation and Serving Workers	0	91	15	0		317	
<b>Cyber/Computer Forensics and Counterterrorism.</b>	0	2	0	0	2	28	26
Detectives and Criminal Investigators	0	2	0	0		20	
Private Detectives and Investigators	0	2	0	0		8	
<b>Dental Assisting/Assistant.</b>	0	340	2	0	342	132	-210
Dental Assistants	0	340	2	0		132	
<b>Developmental Services Worker.</b>	0	5	13	0	18	259	241
Social and Human Service Assistants	0	5	13	0		259	
<b>Electrical/Electronics Equipment Installation and Repair, General.</b>	0	54	0	0	54	8	-46
Electric Motor, Power Tool, and Related Repairers	0	54	0	0		8	
<b>Emergency Medical Technology/Technician (EMT Paramedic).</b>	0	50	4	2	56	89	33
Emergency Medical Technicians and Paramedics	0	50	4	2		89	
<b>Foodservice Systems Administration/Management.</b>	0	11	0	0	11	571	560
Cooks, Institution and Cafeteria	0	11	0	0		124	
First-Line Supervisors of Food Preparation and Serving Workers	0	11	0	0		317	
Food Service Managers	0	11	0	0		130	
<b>Logistics, Materials, and Supply Chain Management.</b>	0	3	0	0	3	32	29
Transportation, Storage, and Distribution Managers	0	3	0	0		32	
<b>Machine Tool Technology/Machinist.</b>	0	14	0	0	14	580	566
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		28	
Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		5	
Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		30	
Forging Machine Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		6	
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		60	
Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		5	
Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		33	
Layout Workers, Metal and Plastic	0	14	0	0		2	
Machinists	0	14	0	0		329	
Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		5	
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		69	
Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	0	14	0	0		8	
<b>Medical Administrative/Executive Assistant and Medical Secretary.</b>	0	19	0	0	19	377	358
Medical Assistants	0	19	0	0		275	
Medical Secretaries	0	19	0	0		102	
<b>Medical Insurance Coding Specialist/Coder.</b>	0	145	5	0	150	324	174
Medical Assistants	0	145	5	0		275	
Medical Records and Health Information Technicians	0	145	5	0		49	
<b>Medical Insurance Specialist/Medical Biller.</b>	0	69	0	0	69	102	33
Medical Secretaries	0	69	0	0		102	
<b>Medical Office Assistant/Specialist.</b>	0	111	0	0	111	377	266
Medical Assistants	0	111	0	0		275	
Medical Secretaries	0	111	0	0		102	

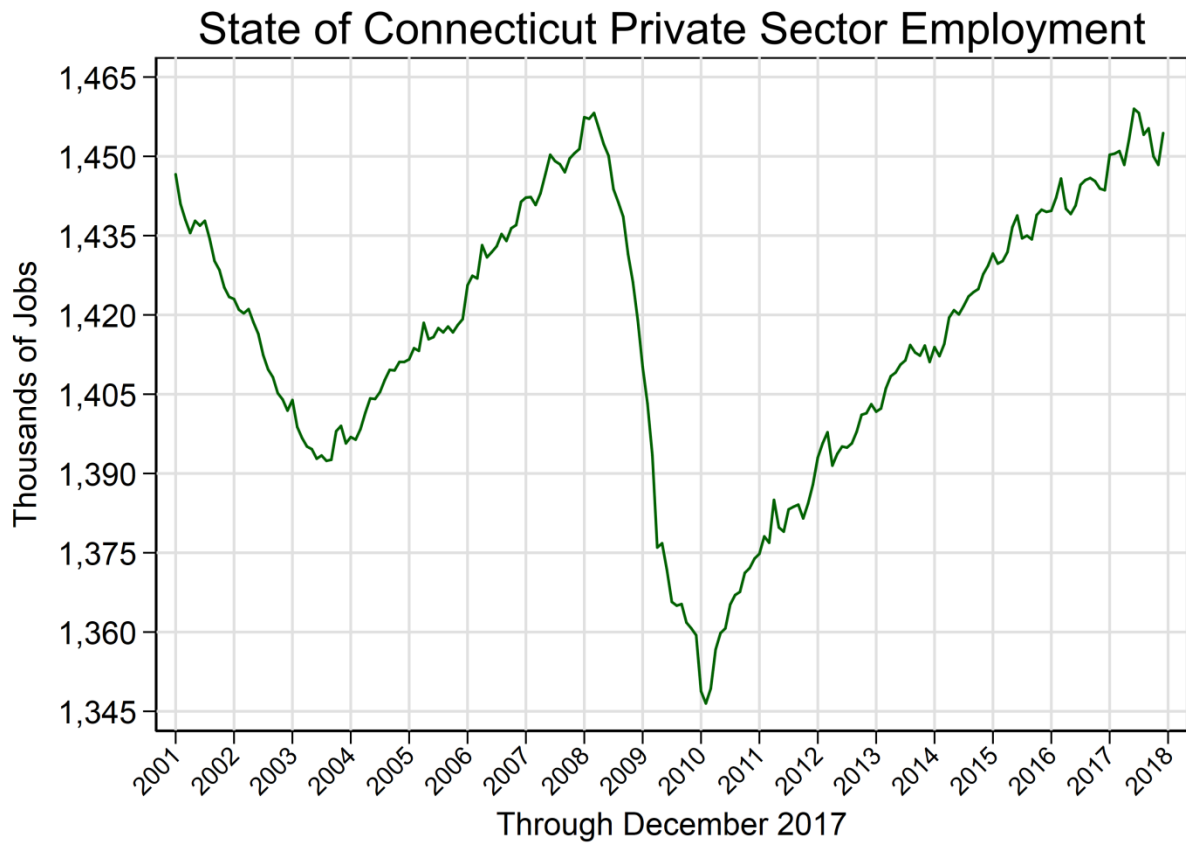
**Table 6: (Continued)**

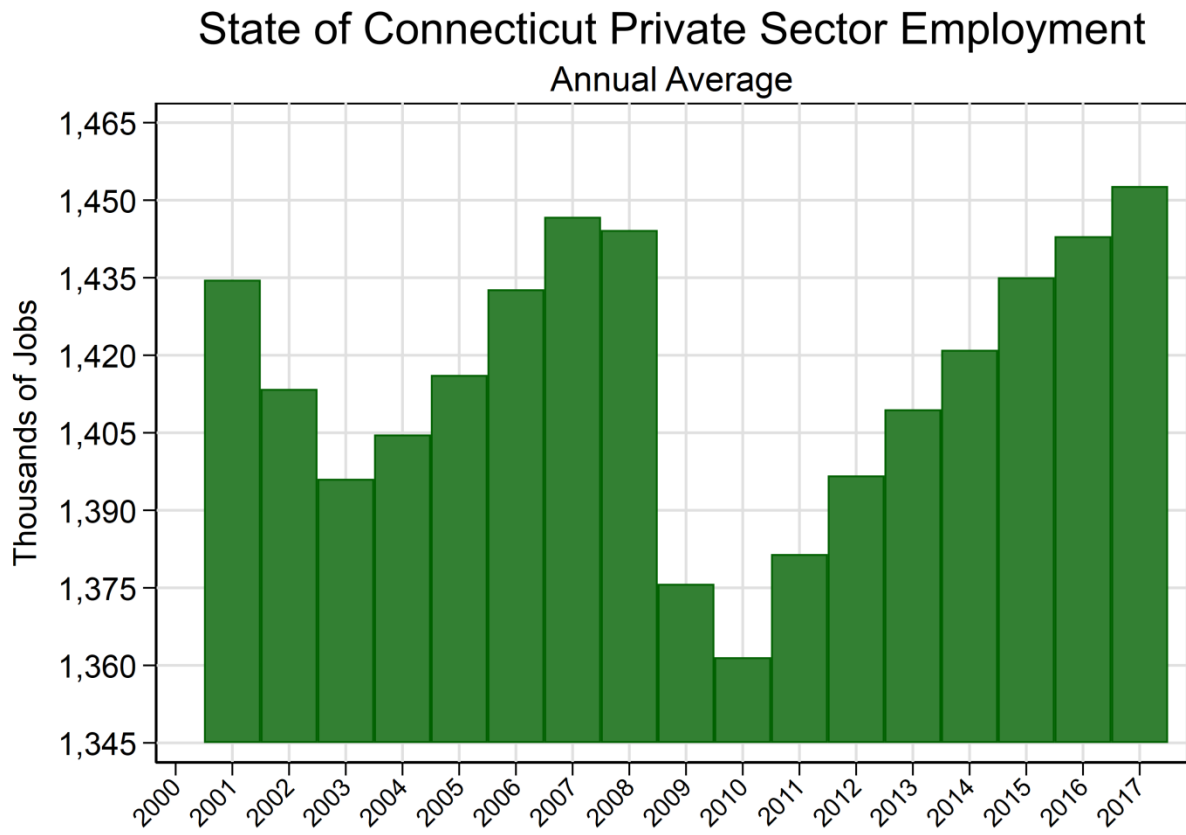
Educational Program (CIP Title - Black Bold) Occupation (SOC Title - Blue Bold)	HS Degrees Awarded	Post Secondary Cert's Awarded	Associate Degrees Awarded	Batchelor Degreed Awarded	Total Completers	Total Projected Annual Openings	Projected Surplus or Deficit
<b>Medical/Clinical Assistant.</b>	0	1114	76	0	1190	275	-915
Medical Assistants	0	1114	76	0		275	
<b>Nursing Assistant/Aide and Patient Care Assistant/Aide.</b>	0	249	0	0	249	639	390
Nursing Assistants	0	249	0	0		639	
<b>Ophthalmic Technician/Technologist.</b>	0	10	0	0	10	19	9
Ophthalmic Medical Technicians	0	10	0	0		19	
<b>Phlebotomy Technician/Phlebotomist.</b>	0	43	0	0	43	49	6
Phlebotomists	0	43	0	0		49	
<b>Psychiatric/Mental Health Services Technician.</b>	0	81	186	0	267	57	-210
Psychiatric Aides	0	81	186	0		45	
Psychiatric Technicians	0	81	186	0		12	12
<b>Quality Control Technology/Technician.</b>	0	10	2	0	12	230	218
Inspectors, Testers, Sorters, Samplers, and Weighers	0	10	2	0		230	
<b>Surgical Technology/Technologist.</b>	0	68	19	0	87	12	-75
Surgical Technologists	0	68	19	0		12	
<b>Surveying Technology/Surveying.</b>	0	3	0	0	3	3	
Surveying and Mapping Technicians	0	3	0	0		3	
<b>Water Quality and Wastewater Treatment Management and Recycling Technicians.</b>	0	5	0	0	5	33	28
Water and Wastewater Treatment Plant and System Operators	0	5	0	0		33	

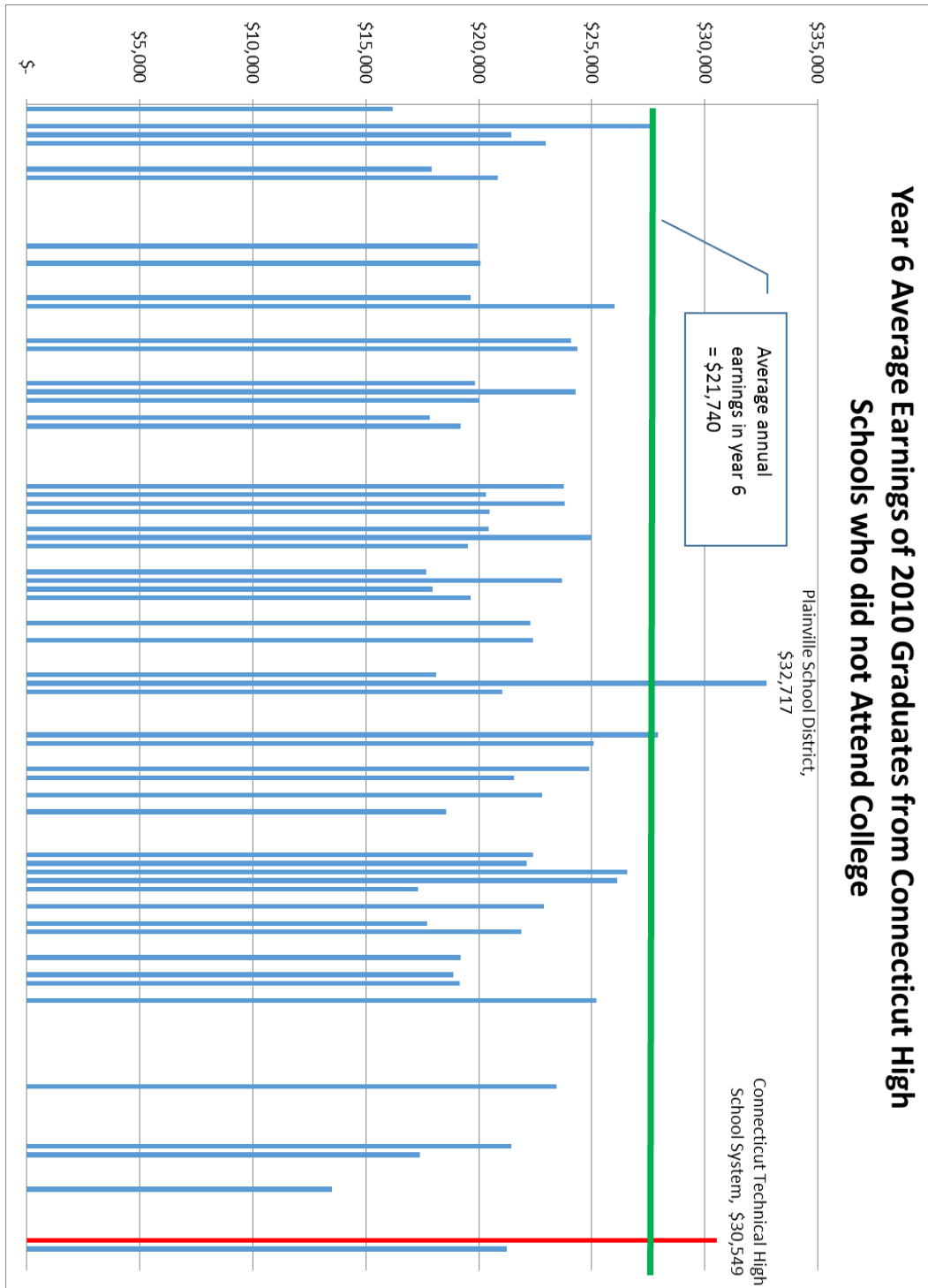
Source: CTDOL TEPS program

APPENDIX CHARTS









SOURCE: 2017, Connecticut Department of Education (SDE): Data are from SDE and Connecticut Department of Labor wage records, linked via P-20\_WIN data sharing Network