

TECHNOLOGY EMPLOYMENT

IN COLORADO PARTNERSHIP

Annual Report April 2017



TECHNOLOGY EMPLOYMENT

EXECUTIVE SUMMARY

The Technology Employment in Colorado Partnership (TEC-P) is the largest tech-based workforce development grant in Colorado. It is a \$6.17 million grant through the U.S. Department of Labor (USDOL) using H1B funds, and stresses training long-term unemployed and incumbent workers in occupations most commonly filled with foreign workers brought over on H1B Visas. The grant is part of the USDOL, Ready to Work Partnership (Ready-To-Work) initiative to support and scale innovative collaborations between employers, nonprofit organizations and workforce development areas to help connect ready-to-work Americans with ready-to-be-filled jobs. The performance period and funding for the grant runs from November 1, 2014 through October 31, 2018.

TEC-P is an employer-led approach to develop education and training career pathways leading to employment of long-term unemployed, underemployed and incumbent workers in middle- to high-skilled jobs in Information Technology or Advanced Manufacturing. It combines the efforts of six workforce development areas to support the Information Technology (IT) and Advanced Manufacturing (AM) sectors.

During its first year, TEC-P developed the foundation for partnership with sector businesses and training providers necessary to lead participants to successful employment within these targeted sectors. In year two, due to the collaborative efforts by regional liaisons and conveners of sector based partnerships, the TEC-P program is well on the way to exceeding all metrics and provide training and employment opportunities to eligible job seekers. As of December 31, 2016, 313 individuals have been served, including 8 incumbent workers, who were upskilled to avoid future layoff, and 305 long-term unemployed. Of these, 121 have been placed at an average annual wage of \$68,413.

Who we are: The TEC-P workforce partnership is comprised of the Denver Office of Economic Development (OED), as the lead applicant; the Colorado Urban Workforce Alliance (CUWA)—as project convener; six workforce development areas, 71 Information Technology and Advanced Manufacturing companies, the Colorado Technology Association, and the Manufacturing Edge, and a number of postsecondary education providers, including Colorado's first Information Technology registered apprenticeship program, Techtonic.

WORKFORCE PARTNERS

Through this regional grant, partnering workforce centers along with the Colorado Urban Workforce Alliance (CUWA) have the ability to support high tech occupations. Five regional workforce areas along Colorado's Front Range and one on its Western Slope, have partnered to support these sectors through TEC-P. They are Denver Workforce Services, the American Job Center (serving Jefferson, Gilpin and Clear Creek counties), Arapahoe/Douglas Works! (serving Arapahoe and Douglas counties), Workforce Boulder County, Larimer County WFA and Mesa County WFA.



"Working with the staff at TEC-P has allowed us to expand our business and the support has been great. We look forward to working with the TEC-P team for years to come." – Angela Del Ponte, Office Manager, RedPoint Solutions



EDUCATION PARTNERS

TEC-P has partnered with a number of public and private education entities, including Western State and the Colorado Community College System. In addition, a number of proprietary schools, including: 360 Training, APICS, CA Technologies, Code Craft, Colorado State University, DaVinci Coders, University of Denver, EdX, Galvanize, General Assembly, IQ Shares, LeaderQuest, New Horizons, Salesforce, T3 Resources, Tuliva and Agile, provided short-term training in cases where the training need was confined to specific credentials or coding languages.

TEC-P IMPACT

TEC-P is designed to serve both long-term unemployed and underemployed persons, and incumbent workers. Long term unemployed people have been without work for 27 weeks or longer, and, as a group, experience a variety of barriers. In addition to often outdated skills, they may suffer from a variety of barriers to success in the workplace. They often are experiencing financial challenges and problems stemming from job loss or changes in position. By bringing long-term unemployed and underemployed into the program and providing training, TEC-P is not only helping the sectors fill critical positions, but is adding substantial new worker earnings to the regional economy. These earnings are used to purchase goods and services, and add to the tax base. By placing 121 people at an average wage of \$68,413, TEC-P has added over \$8.3 million in new worker earnings to the region.

Jamie had been unemployed for 9 months when she attended a TEC-P event and heard about the job search and training assistance that was available through the TEC-P program. She has over 20 years of experience as a project manager and business analyst but she felt that her biggest barriers to employment were that she didn't have certifications and was long-term unemployed. Through the TEC-P program Jamie was able to work on updating her resume and went to training at Agile for All where she obtained her Certified ScruM Master Certificate. Jamie accepted a position as an IT Project Manager for E-Builder and is earning \$107,000 per year.

SYSTEMIC LABOR SHORTAGE AND TEC-P

The labor market works on supply and demand. When there are too few candidates for too many positions, then there is a labor shortage.

Experts are increasingly predicting a systemic labor shortage throughout the United States through 2025. The reason for this is that the huge generation of baby boomers, 76 million strong, who have been the mainstay of the U.S labor force for four decades, are now reaching retirement age. The youngest boomers are 53 years old, and the oldest are 71.

What this means is that for each of the last six years, and over each of the next twelve years, approximately 4 million boomers will leave the labor force. In Colorado, this leaves a skill gap in which there aren't enough younger workers to fill. Along Colorado's Front Range this shortage is increasingly acute, particularly for occupations requiring elevated levels of technical skill.



One way to understand this shortage in critical technical occupations is to review data on H1B Visas in the region. Based on this research, two sectors critical to the TEC-P region's economy were identified: Information Technology and Advanced Manufacturing.

Industry Age Distribution IT Sector						
Age Band Number Percen						
14-18 Years	166	0.2%				
19-24 Years	2,528	3.7%				
25-34 Years	15,085	22.2%				
35-44 Years	20,250	29.8%				
45-54 Years	18,055	26.5%				
55-64 Years	10,140	14.9%				
65+Years	1,794	2.6%				
Total	68,018	100.0%				
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Information Technology Sector					
Grouping	Number				
Entering Labor Force	889				
Vacancies (Attrition + Growth)	1,499				
Annual Surplus/Shortfall	(611)				
Source: EMSI 2016.4 QCEW, Non-QCEW & Self-Employed					

Industry Age Distribution Advanced Manufacturing						
Age Band	Number	Percent				
14-18 Years	468	0.5%				
19-24 Years	5,792	5.6%				
25-34 Years	20,769	20.0%				
35-44 Years	24,003	23.1%				
45-54 Years	27,779	26.7%				
55-64 Years	20,504	19.7%				
65+Years	4,769	4.6%				

Source: EMSI 2016.3 QCEW, Non-QCEW & Self-Employed

Advanced Manufacturing Sector					
Grouping	Number				
Entering Labor Force 1,8					
Vacancies (Attrition + Growth) 2,79					
Annual Surplus/Shortfall (990					

Source: EMSI 2016.3 QCEW, Non-QCEW & Self-Employed

These tables are based on an age-band analysis conducted of the labor force in each of the TEC-P sector groups. The reader can see that, in the case of the Information Technology sector, only 889 young people enter the industry each year, while 1,499 leave the labor force. This leaves an annual age-based shortfall of 611 people. The problem is even more acute for Advanced Manufacturing, which has an annual shortfall of 990 people.

One way to understand this shortage in critical technical occupations is to review data on H1B Visas in the region. Based on this research, two sectors critical to the TEC-P region's economy were identified: Information Technology and Advanced Manufacturing.

GEOGRAPHY

The regional geography shown includes Adams and Broomfield counties, though workforce regions in these counties did not participate in TEC-P. This is because Adams and Broomfield counties are contiguous with, and part of, the greater metro Denver labor shed. When Adams and Broomfield are added, the Front Range area comprises the Colorado Central Workforce Development Planning Region.



SECTOR OVERVIEW – INFORMATION TECHNOLOGY

The Information Technology (IT) sector is particularly critical to the overall economy on Colorado's Front Range. First, it is an industry in its own right, made up of businesses that provide software development, systems design, data hosting and web publishing and internet portal services. Second, the computer & mathematical occupations that make up over half of the IT sector are also critical in other key sectors within the region. According to Economic Modeling Specialists, Inc. (EMSI), the IT sector:

- Employs 71,396 people in over 9,000 establishments in the Colorado Central Planning Region and Mesa County.
- Employment in the industry grew much faster than average between 2007 and 2016. It added 19,450 jobs, an annual average growth rate of 3.9%.
- IT is an \$8.9 billion sector in the Colorado Central Planning Region and Mesa County, and in 2016 supported over 193,000 direct, indirect and induced jobs.
- The sector is responsible for over \$16.4 billion in regional economic activity.
- IT is a "traded industry," meaning that it exports over half of the goods and services it sells, with those revenues flowing back into the region.
- The sector is expected to add over 7,200 jobs through 2022.

Historical Trends & Projected Growth, IT Sector



Between 2007 and 2016, employment in the IT sector grew by 19,454 (39.8%). This is an annual growth rate of 4%, which is much faster than the average employment growth over the same period in all industries (1.2% annually). By 2022, employment in the sector is expected to grow to 80,180, which is an annual growth rate of just over 2%.

		Regional Industry Growth Projections, Colorado Central Planning Region and Mesa County								
2022 Jobs Change	Annual	National	Payrolled							
	Jobs Change	Growth	Location	Business						
	Rate	Quotient	Locations							
30 70	0.1%	2.59	412							
58 1,266	2.8%	2.37	474							
09 435	2.9%	1.15	370							
84 3,567	3.3%	1.86	2,966							
65 3,300	2.8%	1.90	3,571							
56 139	3.0%	0.99	61							
78 (3)	(0.0%)	1.34	247							
80 7,229	2.0%		8,101							
3 5 0 8 6 5 7 8	Change 0 70 8 1,266 9 435 4 3,567 5 3,300 6 139 8 (3) 0 7,229	Annual Change Annual Growth Rate 0 70 0.1% 8 1,266 2.8% 9 435 2.9% 4 3,567 3.3% 5 3,300 2.8% 6 139 3.0% 8 (3) (0.0%) 0 7,229 2.0%	Annual Change Annual Growth Rate National Location Quotient 0 70 0.1% 2.59 8 1,266 2.8% 2.37 9 435 2.9% 1.15 4 3,567 3.3% 1.86 5 3,300 2.8% 1.90 6 139 3.0% 0.99 8 (3) (0.0%) 1.34 0 7,229 2.0% 1							

Source: EMSI 2017.1 - QCEW Employees, Non-QCEW Employees & Self-Employed Class of Worker



Employment Concentrations in the IT Sector

Staffing Patterns & Career Pathways: Computer Sciences

When one thinks of jobs in the IT sector, one thinks primarily of computer-related jobs, such as software developer or systems analyst. However, like all industry sectors, IT businesses rely on managers, financial professionals, engineers, art-design-media people, sales and clerical staff. This is called a *staffing pattern*.

The pie chart shows the staffing pattern for the IT sector within the Colorado Central Planning Region and Mesa County. The IT sector is not the only industry



group that has a staffing pattern made up of diverse occupational groups. What this means is that there are *career pathways* for any given occupational grouping in every industry sector.

Computer and mathematical occupations are especially critical in this region, because they enable all the key sectors to compete in a global economy.



This bar graph illustrates how critical computer and mathematical occupations are to the driver industry groups or sectors in the Colorado Central Planning Region and Mesa County.

Aerospace, which includes some Advanced Manufacturing, is heavily dependent on computer professionals, as are finance & insurance and engineering service. Each of these sectors are highly concentrated in the region.

Manufacturing, which now uses advanced technology to operate its production, packaging and shipping systems in sync, requires 4.6% of its staff to be computer sciences professionals.

SECTOR OVERVIEW – ADVANCED MANUFACTURING

Manufacturing is also an important sector in the Central Planning Region and Mesa County. Substantial portions of Colorado's aerospace, bioscience and aviation industry groups are made of up manufacturing operations so the manufacturing sector is critical to continued economic vitality of the region. According to EMSI, manufacturing:

- Employs 107,372 in 3,920 establishments in the Colorado Central Planning Region and Mesa County.
- Between 2007 and 2016, employment in manufacturing declined by 1,488 jobs (-1.4%)
- Manufacturing is a \$9.4 billion sector in the Colorado Central Planning Region and Mesa County, and in 2016 supported over 306,000 direct, indirect and induced jobs.
- The sector is responsible for over \$21.4 billion in regional economic activity.
- Manufacturing is a "traded industry," meaning that it exports just under half of the goods it sells, with those revenues flowing back into the region.
- The sector is expected to add over 6,600 jobs through 2022.



Historical Trends & Projected Growth: Manufacturing

Between 2007 and 2016, the region's manufacturing sector shed 1,488 jobs, a 1.4% decline. However, the manufacturing sector is projected to add 6,646 jobs between 2017 and 2022, a 1.2% annual growth rate.



	Regional Industry Growth Projections, Colorado Central Planning Region										
NAICS Code	Description	2017 Jobs	2018 Jobs	2019 Jobs	2020 Jobs	2021 Jobs	2022 Jobs	Change	Annual Growth Rate	National Location Quotient	Payrolled Business Locations
334	Computer and Electronic Product Manufacturing	17,704	17,643	17,589	17,538	17,498	17,475	(229)	(0.3%)	1.38	326
311	Food Manufacturing	12,530	13,044	13,478	13,851	14,070	14,411	1,881	3.0%	0.62	429
332	Fabricated Metal Product Manufacturing	9,372	9,471	9,557	9,636	9,685	9,760	388	0.8%	0.50	553
339	Miscellaneous Manufacturing	9,256	9,416	9,551	9,659	9,734	9,842	586	1.3%	1.16	492
336	Transportation Equipment Manufacturing	8,652	8,856	9,030	9,180	9,270	9,402	750	1.7%	0.42	126
333	Machinery Manufacturing	8,051	8,281	8,477	8,648	8,749	8,902	851	2.1%	0.56	230
312	Beverage and Tobacco Product Manufacturing	6,658	6,808	6,932	7,038	7,092	7,179	521	1.6%	2.18	222
327	Nonmetallic Mineral Product Manufacturing	5,519	5,569	5,611	5,646	5,665	5,695	176	0.6%	1.02	172
325	Chemical Manufacturing	5,396	5,547	5,675	5,779	5,848	5,945	549	2.0%	0.52	190
323	Printing and Related Support Activities	5,099	5,052	5,013	4,981	4,966	4,940	(159)	(0.6%)	0.88	385
326	Plastics and Rubber Products Manufacturing	5,053	5,209	5,339	5,451	5,509	5,602	549	2.2%	0.56	147
337	Furniture and Related Product Manufacturing	4,458	4,487	4,513	4,538	4,552	4,578	120	0.5%	0.87	210
335	Electrical Equipment, Appliance, and Component Manufacturing	2,156	2,278	2,380	2,467	2,516	2,591	435	4.0%	0.43	73
321	Wood Product Manufacturing	2,141	2,166	2,186	2,205	2,216	2,239	98	0.9%	0.41	104
314	Textile Product Mills	1,473	1,477	1,480	1,480	1,478	1,481	8	0.1%	0.80	100
322	Paper Manufacturing	1,211	1,179	1,151	1,127	1,113	1,094	(117)	(1.9%)	0.28	43
315	Apparel Manufacturing	1,041	1,080	1,111	1,133	1,149	1,172	131	2.5%	0.54	39
331	Primary Metal Manufacturing	733	753	770	785	793	808	75	2.0%	0.15	43
324	Petroleum and Coal Products Manufacturing	714	722	728	735	739	744	30	0.8%	0.51	17
316	Leather and Allied Product Manufacturing	85	84	83	81	81	82	(3)	(0.7%)	0.22	10
313	Textile Mills	75	76	77	79	79	81	6	1.6%	0.03	9
		107 377	109 198	110 731	112 037	112 802	114 023	6 646	1 2%		3 920

Source: EMSI 2017.1 - QCEW Employees, Non-QCEW Employees & Self-Employed Class of Worker



Employment Concentrations in the Manufacturing Sector

CRITICAL OCCUPATIONS ADDRESSED THROUGH TEC-P

TEC-P addresses a number of critical occupations in IT and Advanced Manufacturing. Because it is funded using H1B monies, TEC-P seeks to train and employ American workers in those occupations most commonly filled by foreign workers brought over on H1B Visas.

The 25 occupations identified are shown in the table below. This table shows employment within the Colorado Central Planning Region in the top 20 occupations in the sector. Regional wage ranges and the median wage are shown, with yellowed cells indicating where wage offers may have to fall to attract and retain qualified candidates based on labor supply (applicants per job opening).

	Competitive Wage Analysis, TEC-P Approved Occupations, Colorado Central Planning Region & Mesa County										
SOC Code	Description	2016 Jobs	Annual Openings	Available Applicants	Applicants per Job Opening	Average Wage	10th Percentile Wage	25th Percentile Wage	Median Wage	75th Percentile Wage	90th Percentile Wage
15-1121	Computer Systems Analysts	8,254	409	107	0.26	\$45.27	\$27.71	\$33.91	\$42.80	\$54.31	\$69.49
15-1134	Web Developers	3,205	151	42	0.28	\$29.47	\$17.99	\$20.41	\$25.87	\$36.41	\$46.84
15-1122	Information Security Analysts	1,364	62	18	0.29	\$47.55	\$31.22	\$38.36	\$46.35	\$57.10	\$67.82
15-1141	Database Administrators	2,017	89	26	0.29	\$46.08	\$27.03	\$38.55	\$47.84	\$55.59	\$61.57
15-1131	Computer Programmers	3,174	126	41	0.33	\$41.52	\$24.84	\$31.35	\$38.66	\$50.09	\$58.77
15-1132	Software Developers, Applications	20,972	755	273	0.36	\$49.68	\$31.60	\$39.09	\$48.80	\$58.96	\$71.25
15-1142	Network and Computer Systems Administrators	9,119	257	119	0.46	\$40.32	\$24.91	\$31.69	\$40.03	\$49.12	\$57.62
19-2032	Materials Scientists	136	6	3	0.46	\$46.37	\$27.25	\$35.36	\$46.18	\$57.70	\$66.80
19-4021	Biological Technicians	2,515	108	53	0.49	\$22.26	\$13.96	\$16.53	\$20.91	\$27.18	\$33.41
15-1199	Computer Occupations, All Other	7,742	182	101	0.55	\$44.17	\$25.33	\$34.38	\$44.50	\$54.23	\$61.98
19-2031	Chemists	1,670	59	35	0.60	\$38.21	\$19.03	\$24.88	\$36.75	\$50.80	\$59.98
17-2141	Mechanical Engineers	5,408	273	178	0.65	\$44.32	\$27.04	\$33.07	\$41.03	\$54.15	\$68.31
41-9031	Sales Engineers	2,238	82	56	0.68	\$50.70	\$29.49	\$36.92	\$50.40	\$61.40	\$74.09
17-2112	Industrial Engineers	2,598	125	86	0.69	\$45.02	\$27.51	\$34.89	\$43.83	\$54.89	\$65.18
17-2131	Materials Engineers	610	28	20	0.71	\$53.13	\$32.94	\$40.90	\$54.18	\$64.30	\$77.44
17-2051	Civil Engineers	6,729	307	222	0.72	\$42.20	\$24.87	\$30.58	\$38.00	\$49.09	\$63.65
17-2041	Chemical Engineers	525	23	17	0.75	\$44.47	\$20.64	\$30.83	\$40.78	\$56.09	\$74.06
27-1021	Commercial and Industrial Designers	615	27	23	0.85	\$30.30	\$20.50	\$23.49	\$29.41	\$35.66	\$41.90
17-2011	Aerospace Engineers	1,974	76	65	0.85	\$63.95	\$36.81	\$45.54	\$58.67	\$75.42	\$93.21
13-1199	Business Operations Specialists, All Other	33,631	775	673	0.87	\$38.37	\$20.20	\$26.24	\$35.82	\$47.17	\$61.28
17-2199	Engineers, All Other	1,582	60	52	0.87	\$47.84	\$30.84	\$39.25	\$47.19	\$57.56	\$67.78
17-2071	Electrical Engineers	3,128	112	103	0.92	\$45.98	\$28.93	\$34.73	\$43.79	\$54.87	\$67.32
17-2072	Electronics Engineers, Except Computer	4,773	128	158	1.23	\$48.68	\$31.14	\$37.10	\$46.67	\$59.06	\$72.06
11-9199	Managers, All Other	11,491	453	609	1.35	\$41.78	\$25.70	\$31.91	\$39.07	\$48.64	\$61.19
11-3021	Computer and Information Systems Managers	6,044	233	320	1.38	\$75.76	\$47.52	\$57.50	\$69.67	\$87.32	\$144.33

Source: EMSI 2017.1 QCEW Employees, Non-QCEW Employees & Self-Employed Class of Worker

This table shows the relationship between the average monthly hires, and average monthly job postings for each of the 25 approved TEC-P occupations.

Difficulty to Hire, Top Occupations, Colorado Central Planning Region							
Occupation	Avg Monthly	Avg Monthly	Hires Per Listing	Difficulty to			
	Postings	Hires		Hire			
Information Security Analysts	649	60	0.09	Very Difficult			
Web Developers	1,100	120	0.11	Very Difficult			
Computer Occupations, All Other	2,872	358	0.12	Very Difficult			
Industrial Engineers	682	103	0.15	Very Difficult			
Managers, All Other	1,236	296	0.24	Very Difficult			
Network and Computer Systems Administrators	1,848	448	0.24	Very Difficult			
Computer Systems Analysts	1,395	346	0.25	Very Difficult			
Database Administrators	357	92	0.26	Very Difficult			
Computer Programmers	410	127	0.31	Very Difficult			
Sales Engineers	262	84	0.32	Very Difficult			
Software Developers, Applications	2,700	870	0.32	Very Difficult			
Electrical Engineers	399	132	0.33	Very Difficult			
Computer and Information Systems Managers	628	247	0.39	Very Difficult			
Mechanical Engineers	332	225	0.68	Very Difficult			
Civil Engineers	396	289	0.73	Very Difficult			
Biological Technicians	124	95	0.77	Very Difficult			
Materials Scientists	5	5	0.84	Very Difficult			
Electronics Engineers, Except Computer	189	161	0.85	Very Difficult			
Aerospace Engineers	75	65	0.87	Very Difficult			
Engineers, All Other	55	73	1.32	Difficult			
Materials Engineers	17	23	1.35	Difficult			
Chemical Engineers	14	21	1.51	Difficult			
Business Operations Specialists, All Other	768	1,695	2.21	Difficult			
Chemists	28	84	2.99	Medium			
Commercial and Industrial Designers	6	19	3.16	Medium			

Source: EMSI 2017.1 QCEW Employees, Non-QCEW Employees & Self-Employed Class of Worker

For example, take web developers, which are found in the second row down. The table shows that there are 1,100 average monthly job postings in the region for web developers, but only 120 average hires per month.

This means that there is just over one worker available for every ten jobs posted – a 'very difficult' to hire position.



TEC-P DEMOGRAPHICS

Of the 331 participants:

- 241 (77%) are male
- 72 (23%) are female
- 59 (19%) are veterans
- 21 (7%) are disabled
- 305 (97%) are long-term unemployed.





The TEC-P Program was designed to support under represented individuals within the IT and Advanced Manufacturing sectors including, Women and minorities. The graphs on the previous page show the Racial and Ethnic breakdown of participants through 2016. It is noted, that more than 25% of individuals indicated race other than white, and less than 25% are female. The educational attainment graphic indicates that well over half have a bachelor's degree or above. TEC-P



works to address additional challenges or barriers to employment as they are identified.

TEC-P OUTCOMES & REGIONAL IMPACT

As with all sector partnerships, the true value will be realized as the consortia of IT and Advanced Manufacturing continue to work together with public partners to address current and future labor force needs. Currently, TEC-P shows encouraging outcomes, though it should be pointed out that because of the higher cost of tech training and other long-term unemployed barriers, there is a higher cost to serve. This is borne out in the TEC-P per-participant cost, which is \$6,240.43.

TEC-P Wage Outcomes, January, 2015 – December, 2016									
Workforce Development Area	Served	Number Placed in Employ- ment	Average Annual Wage	Aggregate Impact	Public Funds Invested	Cost/ Benefit Ratio			
Arapahoe/ Douglas	61	34	\$74,485	\$2,532,483	\$235,299	10.76			
Boulder	32	13	\$72,238	\$939,099	\$163,406	5.75			
Denver	110	33	\$47,611	\$1,571,170	\$1,198,074	1.31			
Tri-County	61	27	\$71,656	\$1,934,712	\$163,878	11.81			
Larimer	45	12	\$106,995	\$1,283,942	\$179,961	7.13			
Mesa	4	2	\$28,080	\$56,160	\$12,634	4.45			
Total	313	121	\$68,740	\$8,317,566	\$1,953,253	4.26			

Source: Denver Office of Economic Development

Note: The cost/benefit ratio for Denver is low due to the overall project oversight costs being incorporated under "public funds invested". The total cost/benefit ratio of 4.26 will be an accurate reflection of overall cost benefit for the grant.

So far, the 121 participants that have been employed through the grant earned industryrecognized credentials such as PMP, Security+, ITIL, Network, and CCNA/CCNP. Subsequently,

they were placed in employment at an average wage of \$68,740. This is a cost of \$6,240.43 per participant, which yielded an aggregate economic impact of over \$8.3 million in new worker wages, which are spent locally for goods and services and contribute to the tax base.

For every public dollar invested in TEC-P, the return is \$4.26 in increased economic activity in the region.

IN-KIND CONTRIBUTIONS

Sixty-six partners from various industries and resource organizations actively supported TEC-P. Their estimated in-kind contributions are listed below:

Over 150 hours valued at \$6,000

- Other education and training organizations include:
 - o Techtonic Group
 - o Innovation Pavillion
 - o T3 Resources
 - o Turing
 - o BMGI
 - o General Assembly
 - o Galvanize
- These organizations provided event or meeting space, helped create an active referral process for pre-screening eligible candidates, provided input on career pathway discussions, invited TEC-P workforce development partners networking events, and participated on the Advisory Council.

Over 150 hours valued at over \$18,000

- Employers who participated significantly in TEC-P:
 - o Techtonic
 - Red Oak Technologies
 - o Kranect
 - o Optiv
 - o Terumo BCT
 - o 3D Printing
 - Robert Half Technology
 - o Aspenware
 - o Geotech
 - o Lockheed
 - o Spirae
 - o IBM
 - o K2
 - o Visser
 - o Tuliva
 - Charles Schwab & Co.

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o Ball Aerospace

• These selected employers participated on the Advisory Council, supported Meet-ups by providing career coaching and industry information to job seekers, industry events held by TEC-P and provided space for various meetings and customer events as well as input on career pathway and curriculum development.

Over 100 hours valued at nearly \$8,000

- Associations and Chambers participating included:
 - o Colorado Technology Association
 - o Metro Manufacturing Partnership
 - o Women In Manufacturing
 - Society of Manufacturing Engineers
 - Manufacturers Edge
 - o Mountain Plains Minority Supplier Development Council
 - The Commons on Champa
- These organizations and sector partnerships connected with TEC-P through outreach events, meeting discussions on career pathways, sector engagement, Advisory Council, business outreach events, event planning, and business outreach

Over 55 hours valued at \$13,750

- Other stakeholder partners included:
 - o Skillful
 - o State Refugee Office
 - Denver Public Library
- These partners helped TEC-P connect to potential participants in targeted areas with prescreening and referral process, provided meeting space and support for meet-ups, and career pathway support.

ACCOMPLISHMENTS & TESTIMONIALS

Arapahoe/Douglas Works!

Arapahoe/Douglas Works! conducted an IT Sector Panel Discussion for the Talent Pool to learn about job opportunities with three employers that are participating:

- American Automation, which provides critical asset protection and facilities management, specializing in:
 - Cyber Security Solutions
 - Integrated Physical Security
 - Building Automation Systems
 - Protection of Critical Assets
 - Energy Management Solutions
- C Squared Computer Consulting, which provides complete IT Solutions for small to medium sized businesses, specializing in:

- Backup Solutions
- Collaboration/Cloud Services

- Consulting Services
- Hardware Solutions
- o Managed Solutions
- o Repair & Support Center
- o Security Solution
- Red Oak Technologies, which provides IT talent from start-ups to Fortune 500 leaders, specializing in:
 - IT Project Management
 - Website Development
 - Systems Integration
 - o Database Design & Admin
 - o Network Security
 - o Technical Writing / Support

Steven came into the TEC-P program because he was long-term unemployed. He was laid off April 2015 from working as a software support specialist. He knew he needed updated skills to gain full-time employment. Steven has been working in the IT industry for over 15 years and was worried that he would not be able to gain full-time employment because of his employment gap and lack of updated credentials. Through the TEC-P program Steven was able to work on updating his resume and went to training at Winnow Management to obtain his ScruM and his ITIL certifications. Obtaining his certifications was greatly beneficial but he was not still not landing interviews. In August, Steven was entered into the Talent Pool at ADW and started working with the Business Development Representatives who affirmed that he needed to make the suggested resume changes to land more interviews. Steven was directly referred to C Squared through the Talent Pool for a full-time position as a Network and System Administrator. Steven was hired and is earning \$56,000/year a vast improvement from not working for over a year and half. He is happy to be working full-time again.

Boulder County Workforce Center

When she heard about TEC-P, Heather Terenzio, the President and CEO of Techtonic Group, was excited because she had been having a hard time finding software development talent. As she served on the industry advisory panel for the grant, she began to question why software developers need a four-year degree to be successful. In addition, she and colleagues in the field saw that the universities and colleges were not graduating enough people to fill burgeoning need for software coders. She applied to the U.S. Department of Labor's Registered Apprenticeship Program, and developed the very first registered <u>IT apprenticeship</u> in Colorado. The motto of Techtonic Academy is 'We Do Good' in our community by providing opportunities to unemployed and underemployed individuals. We focus on increasing these opportunities to women, people of color, youth, and veterans to enter the Information Technology workforce. This apprenticeship has expanded beyond the needs of Techtonic Group and now serves other TEC-P employers as well.

Boulder County Workforce Center is currently working with Ball Corporation to up-skill 25 incumbent workers.

"I just wanted to share with you that I have been offered and accepted a Network Engineering position with a company called DMEA. It will keep me in Colorado but relocate me to the Montrose county area. My tentative start date is 9/19 next month. Seems to be a great opportunity and although not specifically cybersecurity, it will have aspects that apply and I think they were impressed with my continuing education and working towards my CISSP and CEH. I still plan to complete the certs that the TEC-P grant awarded me. Thank you again for helping me through the process and it definitely had a positive impact on gaining a job offer!" – Unknown Participant.

Denver Workforce Services

TEC-P hosted Manufacturing Talent Event, including Arapahoe/Douglas Works! & America's Job Center serving Jefferson, Clear Creek and Gilpin Counties. Individuals learned about the Advanced Manufacturing sector together with industry leaders and education providers, learned about hiring trends local education/training programs, and industry-related resources and collaborations. An employer industry panel gave a snapshot and forecast of hot job trends and the cultural environment of today's manufacturers. Metropolitan State University of Denver's new Director of Advanced Manufacturing Sciences Institute welcomed the group of nearly 50 jobseekers.

Ryan S, became employed on December 5th, 2016. He was hired by IPG Photonics Corporation as a Software Developer in Maryland and his starting salary is \$85,000. He was long-term unemployed and did some volunteering with Red Point Solutions. This company exclusively focuses on Cloud Solutions Architecting and Salesforce Development. Ryan did have experience in the software development from a previous job, but did not have experience with Salesforce. He volunteered his time to learn about Salesforce and the company reached out to TEC-P for Work experience assistance. While he did the hands on training, the employer recommend that he also take salesforce training to receive a certification. He has completed the training and is waiting for the results of the certification test and is currently employed.

The American Job Center (AJC) Serving Jefferson, Clear Creek and Gilpin Counties

IT positions in Jefferson County are found among variety of employers and not often concentrated as an "industry". The AJC conducts Talent Strategy meetings to discuss job ready individuals enrolled in TEC-P. Based on the credentials and interests of the individuals, we target posted job openings and outreach to those businesses. We have also worked with IT recruiters to help us identify additional opportunities.

They funded one class (CISSP Certified Cloud Professional) and the customer gained employment as a Security Director at \$180,000 for a firm in New York City.

We did an internship (almost) completed: A Salesforce Developer. The company will hire the TEC-P customer for a full-time position making over \$100,000.

"TEC-P has been working with industry leaders to find the need and skill in demand within the IT industry, and consistently works with training entities in providing skills to ensure individuals meet that need." Monique Stone, Director – Business Development, Cloud Infrastructure - Central, ZAYO

Larimer County Workforce Center

On December 5, 2016, Larimer County Workforce Center hosted a TEC-P Meet-Up Event. About 20 IT job seekers attended. The employer panel included the following:

- Jeff Hill, Software Architect, Bounce Software, LLC
- Rusty Scott, CSU Executive Associate Director Academic Computing & Networking
- Paban Sarma, Enterprise Services Director (FITD), Larimer County Government
- David Lacey, Hewlett Packard Enterprise, Systems Design Lab

Several TEC-P customers commented that they received guidance from these speakers, either during the presentation or during a one-on-one conversation after the presentation.

Larimer also presents their services monthly at NoCoNet, and consult one-on-one with their (job seeker) membership to discuss eligibility criteria etc. They have also, presented their training services to the Lee Hecht Harrison group.

Jeff S.

Employer: Agrium Position: Senior IT Financial Analyst Start Date: November 7, 2016 (Jeff started a contract position with Agrium May 23, 2016.) Salary: \$90,000 TEC-P Training: Project Management Professional Employment is definitely related to training, per Jeff. He also states:

"You looked for ways to help me. You inspired me to succeed and assured me that you and the workforce center were always there to support me.

When you came up with the TEC-P direction, you reacted quickly to obtain approval for me to proceed with the PMP boot camp and exam. That quick help made an enormous difference in my future. I was exhausted from job hunting and discouraged that I wasn't getting interviews for positions that I was over qualified for. The PMP certification made the difference for me. Having demonstrated my skills through the exam, it assured employers that I knew project management.

Now, thanks to you, I have another excellent employer and a position that allows me to use those PMP skills. I'm continuing to hone my skills and I am making a higher salary than I was making prior to losing my job. This will really help us pay off the debt we incurred while I was unemployed."

Industry Association and Other Community Partners

These partners include Colorado Technology Association, Metro Manufacturing Partnership, Women in Manufacturing, Manufacturers Edge, the Mountain Plains Minority Supplier Development Council, The Commons on Champa and the Society of Manufacturing Engineers.















Participating Employers

TEC-P Employers								
3M	EXPERIS	NEW DISCOVERY	SOUNDS TRUE PUBLISHING					
ACUMEN DIGITAL	EXPRESS SERVICES	NEWMEDIA	SOURCECODE NORTH AMERICA					
Agrium	FDG INC	NEXUS CORPORATION	SUNRISE MEDICAL					
ALL COVERED	Field Geo Services	NOAA	SWIFTPAGE					
APICS	FRONTIER AIRLINES	NORDSTROM MEDICAL	TALISYS					
BIT SYSTEMS	GISinc	NORTH AMERICAN BANCARD	TECHTONIC					
BRIGHTBEAN LABS	Governor's Office of IT	PANORAMA CONSULTING	TERUMO BCT INC					
C Squared	GUSTAVSON ASSOCIATES	Peer technologies	THE 3D PRINTING STORE					
CENTURY LINK	HITACHI CONSULTING CORP	PEOPLE SHARE	TOWN OF CASTLE ROCK					
COGNIZANT/TRIZETTO	HSS BIOMEDICAL SERVICES INC.	POMEROY	TRIMEDX					
COMCAST	KAISER PERMANENTE	PROLOGIS (COMPRI CONSULTING)	TRUST CO OF AMERICA					
COMPRI CONSULTING	KNOWLEDGE INC	QWOMOX TECJMP	TRUSTWAVE HOLDINGS INC.					
CRAIG HOSPITAL	LEVEL3 COMMUNICATIONS	RAVEN	US Post Office					
CROHIO	LINK TECHNOLOGIES	RAW URTH DESIGNS	VAIL RESORTS					
CTEK PROFESSIONALS INC.	LIVE CONSULTING	RAYTHEON	VANTIC INC					
DELIOTLE	LOCKHEED MARTIN	RENFRO CONSULTING INC.	VERIZON					
DELTA MONTROSE ELECTRIC	LOWE'S	S3 ENGINEERING	VMWARE					
	MECTEV							
	MODIS							
	INIODIS							
EMPLOYED WITH AECOM (ROBERT	NETWORKS UNLIMITED	SNELLING PERSONNEL SERV.	XCEED GROUP					

Conclusion

By all measures, TEC-P, under Denver Workforce Services, has proven a successful grant. The need for qualified tech talent in IT and advanced manufacturing is flourishing as the regional economy continues rapid growth in a full-employment labor market.

TEC-P has served to facilitate industry partnerships and in-kind efforts in a more collaborative and timely manner. The partnerships have become part of the overall strategic tech talent planning in metro Denver and expanding across the Front Range.

The economic impact numbers are very encouraging, with a cost/benefit ratio of 4.26 and over \$8.3 million in increased worker earnings creating economic activity in the region as a result of investing less than \$2 million in training efforts.



The value of the TEC-P partnership far transcends economics, however; the principal partners have now experienced success in working together around tech talent availability. As with the principals in the Greater Metro Denver Healthcare Partnership, the value of continuing to cooperate and sustain the effort once grant funding ends will have tremendous positive impact for the overall economy within the region and certainly for the sector partners.

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