South Central Tennessee Workforce Alliance

2014 Labor and Education Alignment Program (LEAP)

Closing Gaps through Partnerships

IN PARTNERSHIP WITH

1. State Institutions: Tennessee College of Applied Technology – Pulaski, Columbia State Community College
2. LEA/Career Technical Education (CTE): Bedford, Franklin, Giles, Lawrence, Lewis, Marshall, Wayne Counties
3. Private Employers: Nissan, Magneti Marelli, Modine Manufacturing, Lincoln Brass, 4 MAC Machining

Additional Partners: Martin Methodist College

Gattis Leadership – Bedford, Coffee, Franklin, Giles, Lawrence, Lewis, Lincoln, Marshall, Moore, Wayne Counties

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Funding Requested: $1,000,000

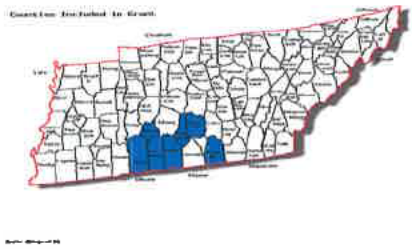
President/Director of Higher Education Institution

Project Director

I. PROGRAM SUMMARY

This LEAP Program proposal, "Closing Gaps Through Partnerships" (CGP) covers a seven-county area in southern middle Tennessee, and is focused on filling the workforce pipeline in Production (Manufacturing) Pathways starting with the high schools. We estimate that our program will give hands-on education and training in targeted technologies to almost 4,000 high school students over the course of the two years. The proposal is enthusiastically supported by key institutions of higher education, secondary schools, employers, economic development and workforce agencies, and the region's Leadership Group, Gattis.

The program aligns closely with the stated goals of the LEAP grants, as well as Drive to 55.



The counties in our target area are similar in demographics, in employment and industry, and in the gap between workforce preparedness and employer needs. This commonality enables us to construct a coherent program which will close the workforce gap in this large underserved geographic area.

The program addresses specific employer needs in the advanced manufacturing sector, our region's largest and fastest growing, where there are literally hundreds of unfilled positions due to lack of prepared workforce, and where well-defined programs can demonstrably strengthen the pipeline.

The program insures that *all* high school students in the area have access to education, information, and transition pathways from school to workforce or to relevant post-secondary training and education. It also provides pathways to more advanced education for TCAT and Community College students. The program has six focal points:

1. Access to Technology Training. High school students in every covered county will have access to four technologies that teach skills that are in high demand by our area employers: Welding Simulators; Mechatronics; Robotics; and 3D Printing , including teacher training to upgrade and level instructional quality;
2. Certified Production Technician (CPT) Certification. Every covered high school program will be required to provide education that will lead to the Certified Production Technician (CPT) credential (an industry recognized certification that supports Drive to 55), as a condition of receiving equipment from the LEAP grant;
3. Dual Enrollment and Articulation Agreements. High school students will have enhanced access to dual enrollment opportunities and seamless transition opportunities to the TCATs, Community Colleges, and Martin Methodist College (the area's only 4-year institution) related to workforce development goals. Martin Methodist will also provide Promise matching, dual enrollment, articulation, or other avenues to TCAT and Community College students to help them transition to workforce-related degrees and certifications;
4. More Advanced Robotics, Multi-Craft Maintenance, Quality Control Measuring, and Welding Technology Access. TCAT Pulaski will add key technologies and courses to its offerings to provide a pathway for students to obtain more advanced training in industry-demanded skills;
5. Connection to Employers. Employers throughout the area have committed to provide meaningful interactions with students through *paid internships*, *on-site camps*, *classroom visits*, *plant tours*, and other informational tools to inform and excite students about careers in advanced manufacturing;
6. Integration with MakerLab. Martin Methodist College's Center for Executive and Professional Development will provide student access to seminars, innovator contests, and innovator/maker space and programs to encourage creativity and concept-to-commercialization experience in a multi generation environment.

II. PROGRAM NEED

By every metric, our covered area is experiencing a crippling gap between manufacturing employer demand and workforce supply. While there is a gap at the statewide level, it is even greater in the area covered by our plan. Compared to the nation, Tennessee gets grades of B in Manufacturing Industry Health, Worker Benefit Costs, and Global Reach. However, it receives a D in Human Capital, standing above only Louisiana, Mississippi, Alabama, West Virginia, and Arizona (Hansen, 2014). Statewide supply and demand analysis for our focal pathways indicates persistent shortages in the pathways that we propose to address (Hedges & Wettemann, 2012):

Career Pathway – Tennessee	Projected Annual Graduates (2008-18)	Projected Annual Openings (2008-18)	Ratio of Supply to Demand
13.1 – Production Pathway	44	4599	1%
13.3 – Maintenance, Installation, and Repair Pathway	575	1519	38%

Jobs4TN foresees high growth for occupations related to our focal Pathways (Jobs4TN, 2014):

Occupation - Tennessee	Annual Projected Growth Rate
Assemblers and Fabricators	3.0%
Computer Numerically Controlled Machine Tool Programmers	3.8%
Computer-Controlled Machine Tool Operators, Metal and Plastics	3.6%

To understand how the supply-demand metrics translate to our area, we examined data from the following sources:

- Survey of key employers in all covered counties;
- EMSI data for the area (Economic Modeling Specialists International, 2014).[1]
- Drive to 55 county level data;

[1] Data covered the 7 counties included in the plan, plus Moore, Coffee, and Lincoln, which are in the Gattis Leadership area and were initially considered for inclusion in this plan.

"We struggle to find or fill skilled labor positions such as tool/die, welders, and multicraft maintenance. Modine has more than doubled in size over the past 3-4 years...We struggle to find qualified individuals. Training with simulators would help close the gap..." - Mark Jent, HR Manager, Modine Manufacturing Company

"It is difficult to find locally skilled (workers). We are having to go outside our footprint. A local educated workforce is critical to our future stability." -- Greg Galloway, Plant Manager, Magneti Marelli

"Improving skill levels of these types of employees...will increase their immediate usefulness to employers. The quicker they can hit the ground running... the better". – Troy Akridge, Divisional HR Manager, Lincoln Brass Works

"Our greatest needs and difficulty in hiring are multicraft maintenance, tool/die, welding, and process engineering. (Having simulators in secondary school curriculum) ... would be wonderful!" Stan Welch, HR Supervisor, Nissan Decherd Plant

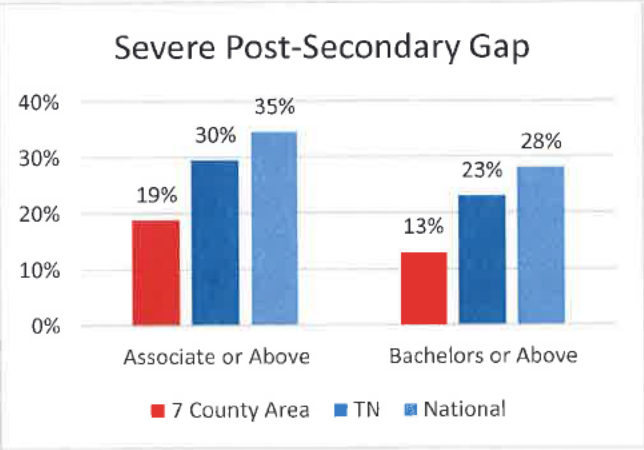
Employers expressed frustration at the gap they experience in the target Pathways and saw relief in our proposed program. In the sidebar are representative statements.

EMSI data for manufacturing production workers (SOC 51) in our target area support and extend the findings from the employer surveys and from the Drive to 55 data. For these workers, the employment base in 2013 was 18,476, accounting for almost 20% of our total labor force.

EMSI estimates that in our area for Manufacturing Production Workers there are 589 annual openings but only 296 related completions, for an annual shortfall of almost 300 jobs per year, or a supply/demand ratio of just 49%. Demand for these jobs in our area is projected to grow 6.4% between 2013 and 2024. These are well-paying jobs for our area, with median earnings effectively at parity with national median earnings. These jobs also contribute to economic growth in the community, with a Location Quotient of 2.68.

Because of aggregation, it is easy to overlook the high growth of some subcategories that we are targeting, because their growth is offset by other subcategories that are stagnant or shrinking. Below are disaggregated data for jobs that our program will directly impact (Economic Modeling Specialists International, 2014).

PROGRAM AREA OCCUPATION GROWTH RATES – TARGETED OCCUPATIONS		
Occupation – Program Area	**% Change 2013 – 2024**	**Median Hourly Wage in Area**
Chemical Equipment Operators and Tenders (51-9011)	40%	$24.53
Extruding and Forming Machine Setters, Operators, and Tenders (51-6091)	22%	$17.90
Drilling and boring Machine Tool Setters, Operators, and Tenders (51-4032)	14%	$14.33
Layout Workers (51-4192)	40%	$18.29
Engine and Other Machine Assemblers (51-2031)	37%	$13.71
Tool and Die Makers	20%	$20.38
Woodworking Machine Setters, Operators, and Tenders (51-7042)	24%	$10.95
Fiberglass Laminators and Fabricators (51-2091)	35%	$12.36
Painters, Transportation Equipment (51-9122)	69%	$15.83
Computer-Controlled Machine tool Operators (51-4011)	52%	$12.99
Team Assemblers (51-2092)	15%	$11.42
Laborers and Freight, Stock, and Material Movers	19%	$10.48
Computer Numerically Controlled Machine Tool Programmers (51-4012)	31%	$18.56
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	13%	$14.41
Multiple Machine Tool Setters, Operators, and Tenders (51-4081)	18%	$12.22
Electrical and Electronic Equipment Assemblers (51-2022)	65%	$11.64
Electromechanical Equipment Assemblers (51-2023)	22%	$13.34
Machinists (51-4041)	8%	$20.54
Weighers, Measurers, Checkers, and Samplers, Recordkeeping (43-5111)	15%	$15.06
Welders, Cutters, Solderers, and Brazers (51-4121)	21%	$15.98
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	44%	$13.51
Source: EMSI		

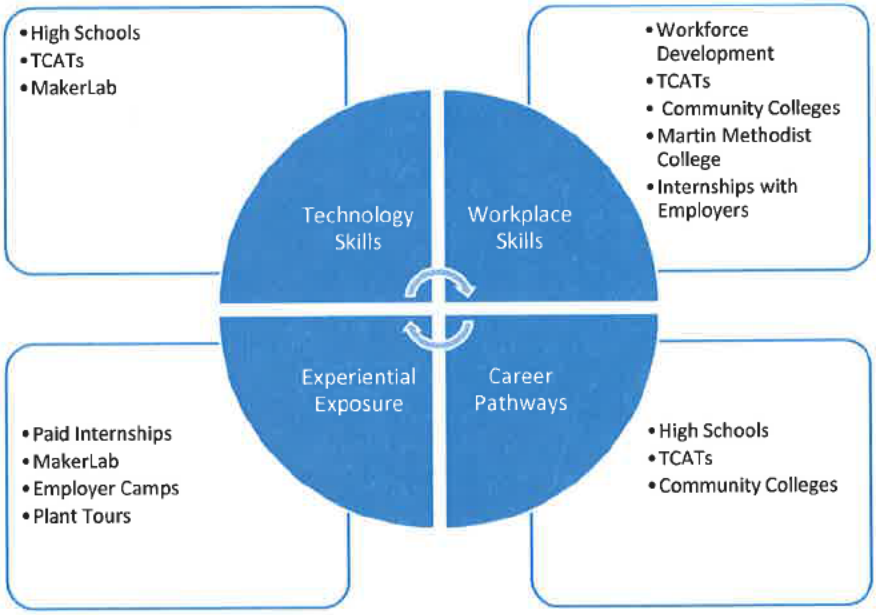


Source: Drive to 55 County Data 1

According to Drive to 55 data, the area is just slightly below parity with the state and the nation in high school attainment. However, there is a very large gap in post-secondary attainment. The national rate of post-secondary attainment is twice that of the program area while the statewide rate is about 50% more than the area rate (Drive To 55, 2014). For Tennessee to achieve the Governor's Drive to 55 goals, it is essential that significantly underperforming areas such as ours be improved.

III. PROGRAM PLAN

The heart of our program is in the high schools. Our objective is to fill the workforce pipeline starting with high school students and transitioning them to work directly or to higher education that is workforce oriented. With our well-rounded program, we plan to satisfy employer needs with students who are trained, motivated, and energized to take up careers in advanced manufacturing. The program is described below, with sections for High Schools, TCATs and Community Colleges, Martin Methodist College, and Employers.



High Schools. Every high school student in the area will have access to hands on experience with the target technologies, as well as (at minimum) a course in Principles of Manufacturing and a course leading to the Certified Production Technician (CPT) certification. Providing the Principles and CPT classes will be a requirement for schools receiving equipment. Schools which do not currently offer these will have to align to offer them no later than fall of 2015. Under the LEAP grant, we will insure that teachers are trained on the equipment and have the necessary certifications and qualifications to teach the courses.

We have surveyed the schools in our proposed area to determine what technology is in place, and what is needed. The equipment provided at each site will be:

- 3D Printers - number of printers related to size of school program
- Welding Simulator

- Mechatronics (PLC) System including 3 bases with 1 programmable logic controller; Programming Software; USB Cable; Stabilized Table; Inventory Station; Inspection Station; Distribution Station; Air Compressor and Dryer
- Robot Additions including Robot Station; Pegasus II Robotic Learning System (5-axis); Linear Traverse Axis; and Flexible Workstation Package.

Taking into account where Principles of Manufacturing is or will be taught and where students have access to hands-on equipment, we have determined the following needs:

County	Number of 3D Printers	Number of Welding Simulators	Number of Mechatronics Systems	Number of Robot Add-Ons
Bedford	3	1	1	1
Giles	2	1	2	2
Franklin	2	1	1	1
Lawrence	3	2	1	1
Lewis	1	1	1	1
Marshall	1	1	1	1
Wayne	1	1	1	1

High schools students will also have access to an expanded curriculum and seamless transition to higher education through TCATs, Community Colleges, and MMC.

TCAT and Community Colleges. The Pulaski TCAT will add four major pieces of equipment so that their adult students and their dual enrolled high school students will be able to obtain more advanced training. These were selected based upon a study of area employers' specific needs, and the likely continuation of those needs into the future.

Equipment	Illustrative Companies Benefiting		Anticipated Annual Job Openings
Fanuc C.E.R.T. Robot – real-world robotic training using industry standard software and controllers	Calsonic Kansei I.B. Technologies SaarGummi Magneti Marelli	DRM LLC InMotion LLC Frito-Lay	21
NIDA 360 System Trainer with Industrial Controls – teaches technical troubleshooting, systems thinking, knowledge of AC-DC, fiber optics, motors and motor controls, NEC Code, and electro-mechanical maintenance.	Assurance Operations Corp. Calsonic Kansei Frito Lay Modine Manufacturing	Berry Plastics Dura Automotive Johnson Controls Magotteaux	24
Coordinate Measuring Machine – Computer controlled coordinate measuring is an essential part of quality control used for dimensional inspection and to adjust production equipment and processes	Calsonic Kansei Dura Automotive Magneti Marelli SaarGummi Windsor Mold/Tenneplas	Cosmolab Goodman Manuf. Modine Mfg. Talos Engineering	27
Miller Panasonic Welding Cell – Teaching skilled welding and operation of a robotic welder, including assessing weld quality, set up, and operations.	Calsonic Kansei Columbia Machine Works General Motors Magneti Marelli	Nissan InMotion LLC I.B. Technologies Modine Manuf.	47

TCAT will also expand its course offerings to high school students via new dual enrollment and articulation agreements. Finally, it will be the fiscal agent for the LEAP grant.

Martin Methodist College and MakerLab. Martin Methodist College (MMC) is the only 4-year institution in the target area. MMC is approved for dual enrollment, which would permit them to offer high school courses compatible with the goals of the LEAP grant, for example, Leadership/Teamship and Principles of Project Management. MMC is also accessible through Promise Grants[2] and articulation agreements for Community College students. Its Center for Executive and Professional Development offers additional courses related to industry-recognized certifications.[3]

Students in the high schools, TCATs, and Community Colleges will have access to MMC's Innovation Lab/Maker Space (MakerLab). The MakerLab is indispensable in nurturing creativity and entrepreneurship and generating excitement among the area's manufacturing-oriented students. Students can participate in innovation competitions, seminars, mentoring, and other learning experiences to understand such concepts as rapid design, prototyping, market testing, and the business aspects of taking a new product to market. Students will have the opportunity to form innovation teams and to participate in multi-generational teams, an experience that has been repeatedly cited as a key to the Pathways to Prosperity concept (Pathways to Prosperity Network, 2014). The LEAP grant will allow MakerLab to provide these opportunities free of charge to high school students. MakerLab activities take place primarily on evenings and weekends, extending our LEAP program to after-school hours.

Employers. Students will have multiple points of contact with area employers through a program of school visits, employer plant tours, informational initiatives, and special programs such as the

[2] MMC's unique program, Promise Plus, doubles the Promise grant for eligible students, and carries it through four years should the student matriculate to a baccalaureate program.
[3] These programs will not be paid for through the LEAP grant. Their presence does, however, support LEAP goals and ties MMC into workforce development initiatives.

Manufacturing Camp piloted by Magneti Marelli in Summer 2014, which will be expanded to other employers during the grant period. (See Appendix A for a description of the Camp experience.) In addition, we are especially proud that so far, employers have committed in writing to provide a total of 50 paid internships throughout the 24 month grant period.

Goals and Assessments. Numeric goals will be set for each aspect of the program, and carefully monitored. At the end of each academic semester, performance will be measured against goals. Where there are shortfalls, we will diagnose the reasons and make any needed mid-course corrections. Where there are successes, we will seek to understand, replicate, and expand on them. Assessment will be under the direction of Dr. Dennis Haskins at MMC. Our assessment strategy is detailed in Appendix B.

Project Timeline. The project critical path and individual steps and responsibilities have been incorporated into Microsoft Project where they can be monitored and managed by the Steering Committee. All partners are agreed with the feasibility of the timeline tasks and responsibilities. The timeline is shown in Appendix C.

IV. STRONG PARTNERSHIPS

Each of the partners in our plan is fully committed and has a clear mandate for achieving project goals. The partners and many of their roles have already been discussed in this proposal. Below, we recap the names of the partners and summarize their roles. Brief bios demonstrating further capability of all significant participants are in Appendix D. Letters of support from partners are in Appendix E.

Partner	Person(s)	Role
Gattis Leadership Group	Kim Ketchum Vic Pusser Mark Jent Edna Luna	Ketchum – Chair of LEAP Project Steering Committee for Leap Grant Pusser – Member of LEAP Project Steering Committee This LEAP application grew out of discussions held within the framework of the Gattis Leadership Class of 2014. Consequently, Gattis officers will play a key role in oversight of the project.
LEAP Project Steering Committee	Kim Ketchum (Chair-Industry) Vic Pusser (Gattis) Mark Jent (Industry) Tony Creecy (TCAT – LEAP Project Fiduciary) Jan McKeel (SCTWA Executive Director and LEAP Project Director)	The Steering Committee will provide overall governance and review of the project, based upon goals and achievements and continuing input from other partners. The Committee will meet monthly initially and then quarterly to review, resolve issues, and redirect program elements as needed
Accountability Committee	Dennis Haskins, MMC, Committee Chair Jan McKeel, Project Director CTEs from the 7 included counties Project accountant /administrator	This Committee will be responsible for tracking project success against goals, and for project financial monitoring and controls. The Accountability Committee reports to the Steering Committee. There will be annual audits of the project books.
TCAT - Pulaski	Tony Creecy, Director of TCAT – Pulaski Stephen Milligan, Assistant Director of TCAT	The TCAT will be the Fiscal Agent for the project. The TCAT will also be responsible for master purchases of equipment going to the high schools and to the TCAT itself. The TCAT will provide programs through Dual Enrollment, Articulation Agreements, and regular TCAT enrollment, to expand and extend the manufacturing-oriented education to students in the target areas.
High Schools	CTEs	The area CTEs are an essential part of the pathway to success. We will engage them on a continuing basis by including them in our Accountability Committee
Community Colleges	Columbia State Community College Motlow State Community College	The Community Colleges will play an essential role in offering courses that provide workplace skills and knowledge
Martin Methodist College	Dr. Dennis Haskins Dr. Cheri Thomas	Dr. Haskins will provide LEAP program assessment. MMC will enhance its Dual Enrollment and Articulation agreements to provide more pathways for students in the high schools, Community Colleges, and TCAT. The MakerLab (Dr. Thomas) will provide opportunities for students to experience the creativity and excitement of bringing innovative ideas to life.
Employers	Magneti Marelli Nissan Lincoln Brass Modine Additional employers will be engaged upon grant award.	These employers have committed to all or some of the following: • Paid internships • Summer camps • School visits • Plant tours
Other Supporting Agencies	TAMA Southern Automotive Women's Forum	The support of a wider community of agencies and organizations will strengthen our project and provide new avenues through which to advance our goals.
Gap Summit – Post Grant	Edna Luna – MMC	The Gap Summit will coordinate and insure project sustainability

V. BUDGET PLAN

The grant contract budget from the LEAP grant will be used primarily for advanced manufacturing training equipment for school systems in 7 counties, TCAT – Pulaski, and MMC's MakerLab (line 20 - $874,590), indirect cost ($80,000) for financial and contract management, project report generation,

accounting and financial information, assessment, and all other information compilation needs. Line 4 includes $45,410 for the development and instructional costs for high school activities through MakerLab, including innovation contests and programs on the maker movement delivered at the high schools. The participating employers will fund internships for students, providing the required match for the proposal. Employer funded Manufacturing Camps will be another in-kind activity, with staff salaries of the employer sponsor organizations assisting with the camps contributing to the required match. In total we estimate that cash and in-kind contributions from the partners will total well over $353,388, a match of more than 35%. The table below provides the budget summary in the form requested. Appendix F provides further detail on the budget items.

GRANT BUDGET				
Leap Program Competitive Grant				
The grant budget line-item amounts below shall be applicable only to expenses incurred during the following applicable grant period: BEGIN: December 15, 2014 END: December 15, 2016				
POLICY 03 Object Line-Item Reference	EXPENSE OBJECT LINE ITEM CATEGORY[1]	GRANT CONTRACT	GRANTEE PARTICIPATION	TOTAL PROJECT
1.2	Salaries, Benefits & Taxes		353,388	353,388
4, 15	Professional Fee, Grant & Award[2]	45,410		45,410
5,6,7,8,9,10	Supplies, Telephone, Postage & Shipping, Occupancy, Equipment Rental & Maintenance, Printing & Publications			
11.12	Travel, Conferences & Meetings			
13	Interest[2]			
14	Insurance			
16	Specific Assistance To Individuals			
17	Depreciation[2]			
18	Other Non-Personnel[2]			
20	Capital Purchase[2]	874,590		874,590
22	Indirect Cost	80,000		80,000
24	In-Kind Expense			
25	GRAND TOTAL	$1,000,000	$353.388	$1,353,388

VI. SUSTAINABILITY

We have carefully structured our LEAP program to have durability without the need for ongoing grants and fund-raising after the grant period is over. The LEAP grant will provide for the initial equipment purchases, training, and development of goals, objectives, success measurement, and coordination and

communication mechanisms between the partners. The decision to use the budget primarily for investing in equipment was very strategic. Employers need workers who have had the courses and training that utilize the equipment we will be providing. However, the capital required to obtain the equipment is beyond the reach of the schools. These purchases will jump start these much needed programs and position the schools to continue them after the conclusion of the grant period at a cost that is within their normal operating budgets and supplemental funds available through on-going programs such as Perkins grants. The ongoing costs of maintenance, upgrades and updates, consumables, and instructional fees are well within their capability to continue. Had we invested primarily in payroll instead of equipment, those monies would be difficult to sustain.

Similarly, once the dual enrollment and articulation agreements are in place, their continuation will be subject only to periodic review to insure that the programs are still serving the needs of area employers.

Martin Methodist College has committed to provide ongoing organizational leadership by establishing and hosting a permanent annual Gap Assessment Summit. The Summit will be comprised of the TCATs, Community Colleges, CTEs, and Workforce and Economic Development agencies, plus an expanding roll of engaged employers. The permanent Summit group will operate under a mission statement and be tasked with short, intermediate, and long term goals compatible with the sustainable mission, including:

- Regularly updating the gaps analysis through employer surveys and available data sources;
- Continuing measurement of performance against goals, with corrective action where necessary;
- Updating the programs to keep pace with developing models of Pathways programs nationally;
- Revision of the target core competencies and pathways as employer needs evolve;
- Seeking additional grants from governmental agencies and area employers to update equipment as needed.

Given the level of enthusiasm and engagement we have experience with employers, we are confident that we will be able to sustain these workforce pipeline efforts in a durable yet evolving manner.