



A Position Paper on the Role of Career and Technical Education In a Global Innovation Economy

Sacramento Region

October 2008

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In order to move the Sacramento Region's economy forward, we need education, business and civic leaders who want a clear path for our students.

We need to coalesce around a set of rigorous guidelines that will address the challenges of our region's education system.

Most importantly, local, state and federal leaders must get serious about increasing financial investments in expanding CTE courses in our schools.

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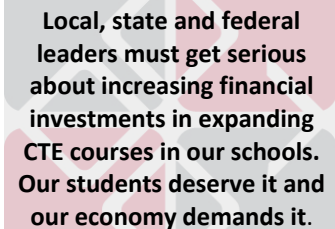
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EXECUTIVE OVERVIEW

The following position paper is based on and supported by core beliefs that guide the work of LEED—Linking Education and Economic Development—a nonprofit organization based in Sacramento, CA. The following are the key points covered in this document:

- **State Leaders Support CTE**
- **CTE Supports and Develops Core Academic Skills**
- **CTE Must Support Post-secondary Admission Standards**
- **CTE Will Play an Increasing Role in Fulfilling A-G Requirements**
- **Sacramento Success Stories Prove That CTE and College Level Academics are Compatible**
- **Students Benefit from Comprehensive Career Counseling and Career Exploration**
- **CTE Requires Strategies to Recruit and Prepare CTE Teachers**
- **Education and Employer Partnerships Benefit Regional Workforce Development Efforts**
- **Successful Education and Workforce Development Requires Investment**
- **Policy Makers Must Invest in CTE to Increase Student Achievement and Grow the Economy**



Local, state and federal leaders must get serious about increasing financial investments in expanding CTE courses in our schools. Our students deserve it and our economy demands it.

The bottom line: In order to move the Sacramento region’s economy forward, we need education, business and civic leaders who want a clear path for our students. Students that have a rigorous and relevant education will be prepared for life after high school, whether they enter the workforce or a training or degree program. We need to coalesce around a set of rigorous guidelines that will address the challenges of our region’s education system. Most importantly, local, state and federal leaders must get serious about increasing financial investments in expanding CTE courses in our schools. Our students deserve it and our economy demands it.

In order to move the Sacramento region’s economy forward, we need education, business and civic leaders who can look past the messy and uncontrollable environment to define a clear path for our students.

PREAMBLE

Economist Joel Kotkin, in his report titled The Third California, provides compelling evidence that the Central Valley, including the Sacramento region, will be the next major growth center for the state. The changing demographics of the state suggest that the Central Valley must provide a more powerful and relevant education to the students and workers that will populate the area in order to attract the types of businesses and creative innovation that support a high quality of life. In doing so, the Sacramento region can raise its economic bar and increase the opportunities for our future.

The Central Valley must provide a more powerful and relevant education to the students and workers that will populate the area in order to attract the types of businesses and creative innovation that support a high quality of life.

Employers have raised the red flag - there is a shortage of skilled workers and the situation is getting worse. For example, in a 2005 National Association of Manufacturers Skills Gap survey, more than 80 percent of respondents indicated that they are experiencing a shortage of qualified workers overall – with 13 percent reporting severe shortages.¹ In the U.S. Chamber of Commerce 2002 Keeping Competitive report, 73 percent of employers reported “very” or “somewhat” severe conditions when trying to hire qualified workers.²

POSITIONING THE SACRAMENTO REGION AS A COMPETITOR IN THE GLOBAL, INNOVATION ECONOMY

In order to position the Sacramento region for the global, innovation economy the following needs to occur:

Reinforce elementary, middle, and high school education programs that ensure all students are prepared for future employment opportunities and post-secondary education and training.

Provide options for students to reach their highest potential. These options ensure that students will be able to access higher education following traditional pathways to 4-year colleges, transfer program through community colleges, or Career and Technical Education (CTE) certificate programs through community colleges. All of these pathways can be linked to degrees from the California college and university systems.

Attract a more comprehensive investment in CTE in order to engage students, enhance academic achievement, deliver 21st century skills and prepare students for careers critical to support the region’s economy.

Communicate more information about college and career opportunities that help students and families better prepare for career and post-secondary pathways.

¹ National Association of Manufacturers, “2005 Skills Gap Report – A Survey of the American Manufacturing Workforce,” http://www.nam.org/~media/Files/s_nam/docs/235800/235731.pdf.ashx NAM is comprised of 14,000 companies that include Dow Chemical, Kansas City Power & Light, .Sony Electronics, Eli Lilly and Company, ConAgra Foods and AT&T.

² Center for Workforce Preparation, “Keeping Competitive: Hiring, Training, and Retaining Qualified Workers in 2002” (Washington, DC: U.S. Chamber of Commerce, 2002).

STATE LEADERS SUPPORT CTE

Over the past decade, public and private organizations, including the Little Hoover Commission, the Silicon Valley Leadership Group, ConnectEd, Get REAL, California's EDGE Campaign, the Sacramento Metro Chamber of Commerce and the Association of California School Administrators have issued reports and papers calling for a greater emphasis on CTE in California.

There is strong state government support for CTE programs as evidenced by the following. Governor Arnold Schwarzenegger regularly supports efforts to provide more CTE for California students. Lieutenant Governor John Garamendi has conducted a series of meetings to gather ideas for increasing CTE, and State Senate President Pro Tem Darrell Steinberg includes CTE expansion as a key strategy for addressing California's dropout problem. Senator Tom Torlakson supports expanding CTE opportunities and State Superintendent of Public Instruction Jack O'Connell demonstrates his commitment through developing nationally used CTE standards and framework.

California's Education Code requires schools to prepare students for future employment, and regional school leaders believe that CTE can provide motivation for and increase the academic achievement of many disengaged students. Several studies of student attitudes indicate that tying course work to future careers would inspire students to do better in school. Notably, the 2006 "The Silent Epidemic" high school dropout report by the Bill and Melinda Gates Foundation of high school dropouts indicted that 81 percent wanted more "real-world" learning opportunities. CTE has the potential to make education more personal by tailoring what a student experiences in school to his or her individual interests and abilities.

CTE OFFERINGS ARE DECLINING IN CALIFORNIA, DEMAND FOR 21ST CENTURY SKILLS IS INCREASING

While the concept of CTE enjoys increasingly strong support, CTE course offerings have declined significantly in California schools:

In 1987, 952,097 of 1,290,000 California high school students were enrolled in a district-sponsored CTE course or courses. **In 2005**, the number of high school students enrolled in a district-sponsored CTE course had **declined to 633,972** even though the number of California high school students had increased to 1,995,000.

To emphasize the drastic decline of high school students in district-sponsored CTE courses, in **1987, 73.8 percent of California high school students were enrolled in at least one CTE course. By 2005, that number declined to 31.8 percent.** While the numbers may be startling, it is important to understand that **the CTE of 1987 is not what students need to be successful in the 21st century.**

While 30 percent of Sacramento region careers in 2015 will require either a two year, four year or beyond degree³, many of these **jobs will require increasing mastery of technical literacy and training and increasingly sophisticated skills that enable workers to apply that knowledge in the workplace.**

Today's CTE courses are effective in delivering academic content and the skills students need to succeed in the 21st century.

While there will be many transitional jobs in 2015⁴, in order to support a healthy economy, the Sacramento region needs workers who have longer term training and education.

³ 2008 Sacramento Regional Workforce Forecast

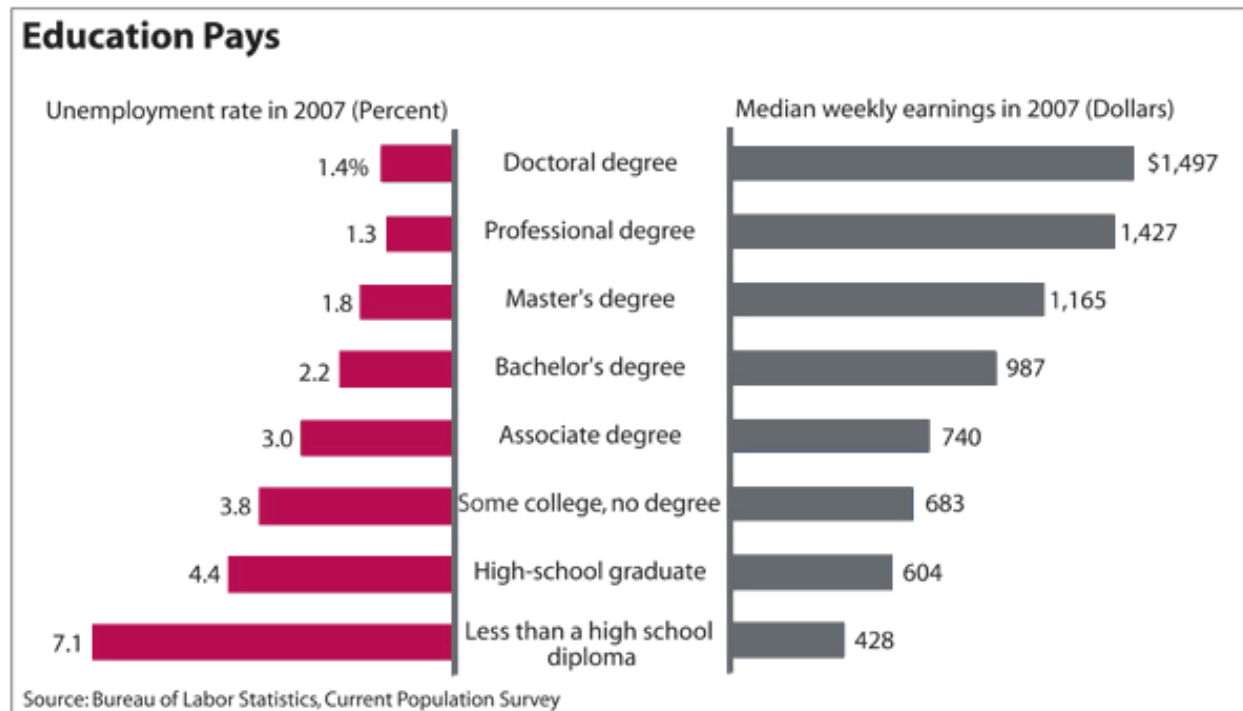
⁴ SRR predicts 52 percent

CTE PROMOTES ALIGNMENT OF EDUCATION AND SKILLS DEVELOPMENT WITH REGIONAL EMPLOYER NEEDS

In order to have a healthy and vibrant economy, the Sacramento region needs employees who have the skills and education to span the range of opportunities.

While a college degree continues to predict a higher standard of living, many employers report unfilled technical and manufacturing jobs paying \$60,000 or more that do not require a bachelor’s degree. However, a study by the National Commission on Adult Literacy indicates that higher education leads to greater lifetime earning potential: “The mean annual earnings of adults (including non-workers) also rose steadily and strongly with their level of formal schooling. Mean annual earnings of adults lacking a regular high school diploma or a GED were only slightly over \$14,400 versus nearly \$23,300 among high school graduates, \$32,000 among those with 1-3 years of college, \$50,700 for bachelor degree holders, and a high of \$73,100 among those with a master’s or higher degree. Mean annual earnings of high school graduates exceeded those of high school dropouts by

\$8,860, and mean earnings of Bachelor degree recipients exceeded those of high school dropouts by more than \$36,000.”⁵ As depicted in the following chart, the odds of being unemployed are greater for those who have less than a high school diploma.



In addition to the need for a workforce with a bachelor’s degree, the Public Policy Institute of California predicts that the economy will require 75 percent of the workforce to have at least some post-secondary education. Studies indicate that 83 percent of students with a two-year college degree have the same annual earnings as four-year college graduates, demonstrating the value of completing an associate arts degree. In order to have a healthy and vibrant economy, the Sacramento region needs employees who have the skills and education to span the range of opportunities.

⁵ The Fiscal Consequences of Adult Educational Attainment <http://www.nationalcommissiononadultliteracy.org/content/fiscalimpact.pdf>

CTE SUPPORTS AND DEVELOPS CORE ACADEMIC SKILLS

Today's students—tomorrow's life-long learners—must possess the core academic skills that will enable them to access post-secondary education and training and/or to change occupations in the future. Many of the jobs and professions of the future are not yet known, and as the 21st century economy evolves the workforce will need to adapt. As the economy becomes more “flat” and employers seek greater efficiencies, workers will be required to use technology and make decisions “on the ground” individually and in teams. Mastery of the core academic concepts and 21st century skills will be critical as workers transition and meet the challenges of a rapidly-changing global economy.

DESIGNING CTE COURSES TO REINFORCE ACADEMIC SKILLS

All CTE courses should be designed to reinforce core academic skills.
LEED endorses the following criteria for defining high quality CTE courses:

MATH APPROPRIATE TO THE WORKPLACE

- 25 to 50 math problems per week related to the CTE course subject area
 - For example:
 - Computing doses of medication
 - Computing board feet of lumber
 - Calculating load-bearing capacity
 - Projecting the number of man hours for a project
 - Calculating profit and loss

READING APPROPRIATE TO THE WORKPLACE

- One trade related article per month
 - Students prepare notes or a report

WRITING APPROPRIATE TO THE WORKPLACE

- Reports, orders, newsletters, ads, directions, instructions, etc.

SCIENCE PRINCIPLES APPROPRIATE TO THE WORKPLACE

- Scientific “method” is used for solving problems
- Explicit instruction in applicable scientific laws or theories
 - Scientific vocabulary development

PRESENTATION SKILLS APPROPRIATE TO THE WORKPLACE

- Students present an idea, teach a concept, or explain a process monthly.
 - Require one-on-one, small group, and large group presentations.

CTE courses should also develop basic transferable workforce skills and attitudes such as dependability, honesty, and teamwork. CTE courses should be aligned to the California State Board approved CTE Content Standards to help ensure the quality of curriculum and instruction.

LEED also supports efforts to incorporate more applied learning and real-world problem solving into traditional English, mathematics, science, and social science classes. Per the Little Hoover Commission, “CTE means education that combines academic rigor and real world relevance.”

CTE MUST SUPPORT POST-SECONDARY ADMISSION STANDARDS

The possession of a college diploma continues to be a predictor of future success, and the average college graduate earns 76 percent more than the average high school graduate. Additionally, futurists predict that as California transitions to a “service” economy, the percent of jobs that require a bachelor’s degree in 2025 will be 39 percent, an increase over the 34 percent required in 2005. The acquisition of a college degree also predicts other enhancements for graduates including an expanded perspective of the world, maturity, tolerance, creativity, and perseverance.

By 2025, 41 percent⁶ of jobs in California will require a bachelor’s degree—only 28 percent of the Sacramento region’s workforce-aged population currently has a bachelor’s degree or higher.

The 2025 projection that 41 percent⁷ of jobs in California will require a bachelor’s degree raises a serious alarm for the Sacramento region, given that currently only 28 percent of the local workforce-aged population has bachelor’s degrees or higher. In contrast, the San Francisco and Marin area have over 60 percent, and over 50 percent of the San Jose area workforce possesses at least a four year college degree. To enhance its economic competitiveness, the Sacramento region will need to increase the percent of the workforce with college degrees, particularly in science, engineering, and business management, if it expects to compete with other national and international communities in innovation and research.

Clearly, to position itself for the future, the Sacramento region needs to prepare more students for post-secondary education.

LEED encourages a 25 percent increase over the next five years in the number of students qualified to pursue four year degrees. LEED also supports efforts to inform students of the many pathways available to them to pursue a bachelor’s degree, including direct entry from high school, transfer from a community college, and tuition support from employers.

Clearly, to position itself for the future, the Sacramento region needs to prepare more students for post-secondary education. The statistics for college retention also dictate that students attending college need to be better prepared to meet the academic challenges of advanced studies at the community college, college, and university level.

Numerous studies of the changing workplace indicate that the reading, writing, and mathematics skills required for success for college and in the workforce are converging. The complexity of technical vocabulary, the rapid flow of communication and data, and the infusion of technology require virtually all workers to have powerful reading, writing, mathematics, and science skills to solve the problems and provide the services inherent in today’s 21st century workplace.

CTE WILL PLAY AN INCREASING ROLE IN FULFILLING A-G REQUIREMENTS

Public colleges and universities measure a student’s readiness for college based on the completion of courses deemed to prepare the student for college-level academics. In California, these courses are identified as “a-g” eligible courses. These “a-g” standards have proven merit, but need not exclude academically rigorous CTE courses.

⁶ Study by the Public Policy Institute of California (PPIC), authored by Deborah Reed and Hans Johnson

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LEED supports the concept of providing students with options that include academically powerful CTE courses which can lead directly to the workforce, additional post-secondary training, industry apprenticeships, or higher education.

As many CTE courses as possible should be designed to meet college admission standards. Many CTE courses already meet the “g” requirement for a college prep level elective. LEED supports working with colleges on flexibility for other “a-g” requirements. For example, students might be allowed to meet the requirements in a two course sequence. It may not be realistic to believe a course on the physics of the automobile could cover all of the topics of a typical college recommending physics course in one year, but a well-designed two year course might. Superintendents of districts with high schools appreciate and support the recently published guidelines from the University of California that clarify the requirement for accepting CTE courses for a-g admission criteria. LEED supports continued efforts to expand the number of CTE courses that meet the a-g criteria.

LEED also acknowledges that some CTE courses may be so skill-based or job-specific that the standards for college admission requirements cannot be met. However, these courses should be positioned to support post-secondary career and/or academic choices. A standard of rigor other than the college a-g requirements should apply. For example:

- The course earns college credit.
- The course is linked to obtaining an industry or trade certification or license.
- The course is transferable to an industry or trade endorsed school or training.
- The course earns academic high school graduation credit.

LEED supports the concept of providing students with options that include academically powerful CTE courses which can lead directly to the workforce, to additional post-secondary training, to industry apprenticeships, or to higher education.

SACRAMENTO SUCCESS STORIES PROVE THAT CTE AND COLLEGE LEVEL ACADEMICS ARE COMPATIBLE

Project Lead the Way (PLTW), Franklin High School and Arthur A. Benjamin Health Professions High School provide examples of connections between CTE pathways and higher education. Students in these types of programs and career paths develop the skills and habits necessary for college success and are more likely to enroll in and complete higher education degrees.

Project Lead the Way (PLTW), in its first year of implementation in the Sacramento region, attracted over 1500 middle and high school students to the PLTW science, technology, engineering, and mathematics (STEM) curriculum that emphasizes hands-on applications and project learning. PLTW has been proven to attract underrepresented students to STEM courses, and has also demonstrated success in closing the achievement gap. Students who complete advanced PLTW courses can earn both high school and college credit.

At Franklin High School, students in the school’s STEM program have a college-going rate to a two or four year college of 93 percent. Their CAHSEE first-time pass rate is 100 percent in ELA and 98 percent in Math with 98 percent of the STEM 10th grade students passing both sections of the test the first time. (Figures are based on 107 students testing on March 2, 2008).

At Arthur A. Benjamin Health Professions High School, all of their senior students (108) have applied and been accepted into Sacramento City Community College. The high school also has a CAHSEE first time pass rate of 84 percent in ELA and 80 percent in Math with 72 percent of their 10 graders passing both tests the first time. Approximately 91 percent of the school’s 10th graders passed both tests (93 out of 102).

STUDENTS BENEFIT FROM COMPREHENSIVE CAREER COUNSELING AND CAREER EXPLORATION

Increasing student and parent knowledge about the Sacramento region's projected future workforce needs would enhance counseling about higher education and about careers that do not require a college degree. Secondary teachers and counselors should be as familiar with the region's workforce needs and the variety of future careers as they are with college admission standards.

LEED recommends that an individual career and education path be developed for each student, based on an assessment of interests and aptitudes and educational objectives.

LEED endorses other efforts to improve the quantity and quality of information provided to students and parents about future careers, including the use of interest/skill inventories, participation in career fairs, guest speakers from business and industry, internships, and workplace visits. LEED recommends that an individual career and education path be developed for each student, based on an assessment of interests and aptitudes and educational objectives. The student's education path should include specific plans for career exploration opportunities and a clearly articulated plan that maps out a pathway through secondary and post-secondary program of study. Internship experiences during high school are highly encouraged.

CareerGPS.com, a robust website with information about the region's future workforce, details the availability, earnings, and education/training requirements for the professions and jobs projected for the greater Sacramento area through the next ten years. LEED encourages schools, students, and parents to take advantage of this unique resource.

Secondary teachers and counselors should be aware of and recognize the need for workers in high wage/high skill jobs that do not require a four year degree. Students should be informed of the pathways to those careers, including on-the-job training, professional certificates, apprenticeships, and two-year associate's degrees.

LEED will gather and report data comparing the regional CTE offerings and enrollments to determine the degree of alignment with the projected future workforce needs.

CAREER AND TECHNICAL EDUCATION REQUIRES STRATEGIES TO RECRUIT AND PREPARE CTE TEACHERS

Local school superintendents already report difficulties in hiring highly qualified CTE teachers. The lack of CTE teachers parallels a decline in CTE offerings, as well as a decline in the number of CTE teachers prepared by the college and university system. In 1987, California had 6,922 CTE teachers as compared to 4,932 in 2005, even though the number of students attending public school climbed from 1.29 million to 1.95 million.

LEED supports efforts to streamline the credentialing process for CTE teachers, including the development of regional CTE teacher training programs.

LEED supports efforts to streamline the credentialing process for CTE teachers, including the development of regional CTE teacher training programs. The regional programs should serve both industry professionals seeking to teach as well as current teachers interested in acquiring the skills and/or authorization to teach CTE courses.

LEED supports state and regional efforts to provide incentives for professionals to teach, including expanding summer internships so that teachers have a better sense of the business world, considering financial incentives for businesses to loan professionals to schools, and helping school districts to offer financial incentives to attract business and industry professionals to the teaching profession.

EDUCATION AND EMPLOYER PARTNERSHIPS BENEFIT REGIONAL WORKFORCE DEVELOPMENT EFFORTS

LEED will facilitate workforce roundtables that bring together business, education, and local agency representatives to design and coordinate career pathways.

LEED will facilitate workforce roundtables that bring together business, education, and local agency representatives to design and coordinate career pathways. The roundtables will be charged with identifying best practices for curriculum and instruction, articulating offerings from middle school through higher education.

LEED facilitates employer/educator partnerships in many of its organizational activities and existing programs, including the Sacramento Regional Project Lead the Way Network, IISME (Industry Initiatives for Science and Math Education), and its work with e21, the Sacramento City Unified School District's high school reform effort. LEED also supports developing strategies for recruiting students, and developing internships for students and fellowships for teachers.

SUCCESSFUL EDUCATION AND WORKFORCE DEVELOPMENT REQUIRES INVESTMENT

The Sacramento Regional Research Institute (SRRI) projects that 163,000 new jobs will need to be filled in the next ten years. Additionally, SRRI also projects that there will be another 175,000 job openings due to replacement needs through 2015. In total, SRRI projects 338,000 jobs that will need to be filled in the next decade. This total reflects a projection based on industries that are established and can be predicted. It is important to note that the projections do not include jobs that might be created by innovation, including Sacramento's desire to establish itself as a global leader in "green" technology.

While many of these jobs (137,000) can be labeled as transitional jobs with relatively low wages and low skill requirements (30 days or less of on-the-job training), these positions can be supported by relevant CTE offerings and school work experience opportunities. These jobs provide valuable career paths in industries such as retail, culinary and hospitality and also help prepare students for careers by giving them the critical soft skills that employers have demanded.

More importantly, the remaining 201,000 jobs will require a greater investment in training and/or higher education, including 75,000 jobs that will require a bachelor's degree or higher. Even more potential professionals with higher degrees will be needed if Sacramento is to position itself as a center for innovation, development, and research.

The Sacramento region also has an urgent need to address the state and national high school dropout problem as it is reflected in our local statistics. Linking students to viable careers and offering CTE courses that support core academics has proven to improve the performance and retention of students at risk of dropping out. A National Educational Longitudinal Study indicated that the risk of dropping out was four times higher when students took no CTE courses compared to students who completed three CTE courses for every four academic courses.⁸

POLICY MAKERS MUST INVEST IN CTE TO INCREASE STUDENT ACHIEVEMENT AND GROW THE ECONOMY

A CTE course cost more than a core academic class. Equipment, materials, curriculum, training, and perhaps even salaries cost more for CTE classes than "chalk and talk" classes.

Local, state and federal leaders must get serious about increasing financial investments in expanding CTE courses in our schools. Our students deserve it and our economy demands it.

⁸ Expanding Pathways: Transforming High School Education in California, ConnectEd, pg. 13

ABOUT LEED-LINKING EDUCATION AND ECONOMIC DEVELOPMENT

LEED—Linking Education and Economic Development is a 501(c)3 non-profit organization serving the six county Sacramento region (Yolo, Yuba, Sutter, Sacramento, El Dorado and Placer). For 16 years, LEED has been the Sacramento region's key leader in aligning educational objectives to meet workforce needs. Through dynamic educational, business and economic development partnerships, LEED is guiding the Sacramento region to growing an innovative and well-educated and prepared workforce, developing a STEM (Science, Technology, Engineering and Mathematics) Pipeline, and ultimately, providing the Sacramento region a competitive advantage in a very competitive economic marketplace.

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