

STRENGTHENING KEY INDUSTRIES ON CALIFORNIA'S CENTRAL COAST

TALENT PIPELINE ANALYSIS + RECOMMENDATIONS

MARCH 2024

REACH



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REACH is a Regional Economic Action Coalition uniting public, private and civic leaders across the Central Coast of California. REACH's goal is to transform the quality of life on the Central Coast, a region of about 700,000 people in dozens of cities and towns in the Counties of San Luis Obispo and Santa Barbara. The mission of the private sector-led coalition is to increase economic prosperity through big thinking, bold action, and regional collaboration. reachcentralcoast.org



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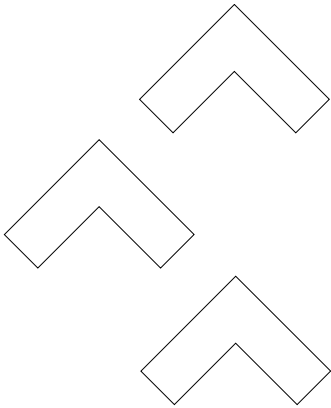
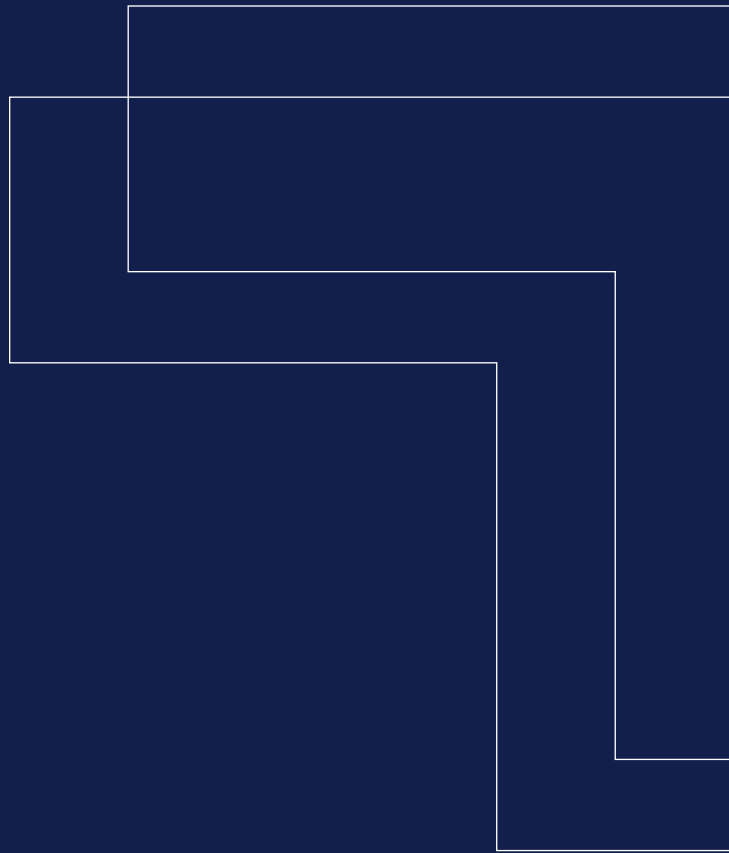


TABLE OF CONTENTS

04	EXECUTIVE SUMMARY
09	INTRODUCTION
16	OVERVIEW OF THE CENTRAL COAST ECONOMY
25	PRIORITY INDUSTRIES RECENT PERFORMANCE AND TALENT NEEDS
27	Aerospace
32	Precision Manufacturing
37	Technology
42	Agriculture Technology
47	Clean Technology
51	Cross-industry Talent Findings
58	TALENT DEVELOPMENT SYSTEM ANALYSIS + KEY INSIGHTS
68	RECOMMENDATIONS FOR ACTION
81	CONCLUSION
82	APPENDIX

EXECUTIVE SUMMARY



The Central Coast of California, known for its innovative spirit and diverse assets and amenities, stands at a pivotal juncture. Boasting an array of prestigious educational institutions and a workforce whose educational attainment meets or exceeds both national and California averages, the region is fertile ground for inclusive economic growth and innovation in the knowledge economy.

AT THE SAME time, the region faces challenges ensuring that its companies can access sufficient workforce and that its residents can access quality jobs. This report embarks on a detailed exploration of the region's advantages, acknowledges the challenges ahead, and sets forth a vision for a future where collective action and strategic talent development elevate the Central Coast's economic and social landscape.

While talent development and access are critical priorities across many regions, the Central Coast faces distinct hurdles:

+ Industrial Composition

The prevalence of small and mid-sized firms in the Central Coast region provides a diverse and dynamic industrial ecosystem. Yet this also introduces considerable variability in talent demand without a large, central industry or employer to help organize and articulate private-sector talent priorities.

+ Scale

With some 700,000 residents and roughly 355,000 jobs spread among several mid-size job centers in a large two-county region, the Central Coast lacks the commuting area scale, density, and relative centralization of larger regional economies in coastal California, such as Los Angeles, the Bay Area, and San Diego.

+ Affordability

Finally, the Central Coast faces mounting challenges around the supply and affordability of housing, which lead to prohibitively high costs for families and, by extension, businesses in the region.

These challenges demand more collective action on the part of area companies and education and training providers to identify shared talent needs, achieve greater programmatic scale, and close workforce development coordination gaps.

This report examines pathways for a collaborative approach to the talent pipeline, specifically targeting five priority industries previously identified in the [REACH 2030 plan](#) and in the two-county [Comprehensive Economic Development Strategy](#) (also known as the Resilience Roadmap): [aerospace and defense](#), [precision manufacturing](#), [technology](#), [clean technology \(cleantech\)](#), and [agricultural technology \(agtech\)](#). It leverages both quantitative and qualitative economic and labor market research for a complete view of the talent landscape, considering the needs of the diverse employers in each of the region's priority industries and the broader talent development system. By rising above occupation-specific or industry-specific siloes, the approach emphasizes a holistic understanding of talent requirements across sectors, paving the way for a more integrated and responsive talent development framework.

+ KEY FINDINGS ON PRIORITY INDUSTRY TALENT NEEDS

- Quality jobs in the region's priority industries share technical skill and knowledge requirements, providing a foundation for multi-industry talent pipeline activities.
- Four occupational categories are most relevant among the region's priority industries:
 - Engineering and engineering technician occupations;
 - Computer and mathematics occupations;
 - Production, metalworking, and assembly occupations;
 - Electrical equipment mechanics and installers

+ KEY FINDINGS ON THE TALENT DEVELOPMENT SYSTEM

- The full range of public, private, four-year, and two-year higher education institutions (providers) play important roles in talent development for priority industries and the four job categories above. While the University of California, Santa Barbara and California Polytechnic State University, San Luis Obispo provide the greatest scale, the region's community colleges produce thousands of graduates equipped for these occupations.
- However, the regional talent development system struggles to balance priority industries—and “next” opportunities—vis-a-vis other industries.

+ KEY FINDINGS ON THE TALENT DEVELOPMENT SYSTEM (CONT.)

- At the program level, many providers are delivering specific interventions that reflect promising practices, suggesting a readiness to innovate.
- There are growing connections among regional workforce and education providers, but not yet at sufficient scale, consistency, or impact.
- Both employers and education and training providers say that the status quo is not working, indicating an opportunity for action.
- The region's prominence of small and mid-sized companies and diverse industry base presents challenges for collective action, raising the imperative of a coordinating intermediary to enable regional collaboration across numerous stakeholders.
- Significant support services, such as mentoring and career counseling, are required to broaden the region's talent pipelines and increase residents' economic mobility.

+ IMPLICATIONS FOR REGIONAL ACTION ON TALENT STRATEGIES

- The Central Coast region must grapple with a central challenge of economic and workforce development alignment: how to balance meeting current demands and future growth objectives—now” versus “next” priorities.
- The prevalence of small and mid-sized companies as opposed to large anchor employers increases the importance of aggregating talent demands in order to achieve sufficient scale.
- Given the economic geography across the two counties, the scale for some interventions may be segmented into subregions and urban centers.
- Costs of living pose a serious barrier to talent access—and by extension the region's economic future.

+ RECOMMENDED STEPS TO IMPROVE THE TALENT PIPELINE AND RESIDENT ACCESS TO QUALITY JOBS

- Establish a coordinating intermediary in the Central Coast region to address collective action problems across employers and talent development providers.
- Improve the mid-skill talent pipeline and expand access to quality jobs.
- Reduce gaps in high-skill talent availability.
- Lower non-skill barriers to opportunity such as childcare access and workforce housing affordability through joint employer efforts.

Making the most of the region's knowledge-powered priority industries requires ready access to the skilled talent that companies need to thrive. But the talent challenges facing the Central Coast are too large for any one organization or business to address on its own. Regional collaboration on employer-led talent development must become a core component of economic development in the region.

WORKING TOGETHER, companies can identify common goals and talent needs, leverage economies of scale, and help talent providers be more knowledgeable and responsive. Employers and workforce developers also can strengthen and expand talent pipelines, reduce barriers to opportunity, and establish well-supported pathways into jobs that pay well. By enabling a more integrated and informed talent development ecosystem, business and economic development leaders can help workers achieve their potential and sharpen the regional economy's competitive edge.



INTRODUCTION



A mid-sized manufacturer spends a year looking for a mechanical engineer. Another employer frustrated with the local talent pool turns to remote workers in other states. When an aerospace company finally finds the right candidate, they decline when they're unable to find an affordable house and a job for their partner.

THESE ARE ALL real examples of common challenges faced by employers in California's Central Coast—the collection of mid-size metro areas in Santa Barbara and San Luis Obispo Counties linking coastal and agricultural communities between Greater Los Angeles and the San Francisco Bay Area.

These obstacles are more than just a headache for hiring managers. They also pose an existential challenge for the region's future. In today's highly competitive, knowledge-driven global economy, access to talent is a key differentiator between regions that succeed and regions that don't.

If the Central Coast hopes to achieve its economic goals and create broadly shared prosperity for current and future residents, it must actively foster regional collaboration to establish a cohesive workforce development system capable of supplying the skilled workers that priority industries seek. In recent years, the region has come together on major economic development priorities in order to break down institutional silos and increase coordination between the private and public sectors, providing a foundation for this next level of action.



THOUGH MANY REGIONS struggle to offer sufficient talent pipelines, the industrial structure and scale of the Central Coast economy pose particular challenges.

The regional prevalence of small and mid-sized companies dispersed across various industries (as opposed to large anchor employers) leads to more fragmented and less predictable talent demands, which in turn complicates the development of potential education and workforce training solutions. Furthermore, with some 700,000 residents and roughly 355,000 jobs, this region lacks the population size and employment density seen in larger regions such as Los Angeles, the Bay Area, and San Diego. These regions have more dynamic labor markets, with large numbers of entry-level workers and experienced talent circulating among companies. Underlying all of this are the challenges posed by inadequate housing supply and related quality of life issues (e.g., childcare) which together limit access to skilled workers and increase the cost of labor.

These challenges demand collective action to identify shared talent needs, achieve greater scale, and close workforce development coordination gaps. Fortunately, regional business and economic development leaders led by REACH are themselves organizing for action in tandem with the creation of the region's first two-county Comprehensive Economic Development Strategy.



THE IMPORTANCE OF BUSINESS LEADERSHIP IN TALENT DEVELOPMENT

Access to skilled talent and an effective workforce development ecosystem have surfaced nationally as top factors for business location decisions over the last decade, surpassing taxes, incentives, infrastructure, or utilities.¹ Historically, however, economic development practitioners have largely left workforce concerns to education and training systems, focusing instead on creating jobs via location branding and marketing, site assembly, subsidies, and business-friendly regulations.

Today the situation is changing. Structural shifts in the labor market mean that skills and knowledge are the fundamental drivers of regional and state economic development. Businesses cannot grow without a capable workforce and regional economies are undermined by frictions that limit access to talent. As a result, industry leaders and economic development professionals throughout the United States increasingly recognize that they must be active partners in talent development in order to achieve their goals.

Economic development organizations, chambers of commerce, industry associations, and business leadership groups are taking direct action with varying levels of intensity.



THESE EFFORTS INCLUDE:

- Identifying employer needs and championing the role that educators and other training providers must play to address regional workforce gaps.
- Using leadership advocacy and/or technical assistance to encourage employer adoption of best practices for talent development, such as work-based learning and skills-based hiring.
- Funding and/or delivering talent development programs such as internships and career exposure, sometimes in partnership with educational institutions and/or training providers.
- Leveraging business relationships and convening power to organize industry-specific employer-led workforce development collaboratives that can identify and address skills needs and build more reliable talent pipelines at scale.

¹Site Selection Magazine survey, November 2020.

THIS REPORT HIGHLIGHTS opportunities for a collaborative approach to talent development focused on five industries previously defined and prioritized by REACH: aerospace / defense, precision manufacturing, technology, clean technology (cleantech), and agricultural technology (agtech).² Drawing on a combination of quantitative and qualitative economic and labor market research, this report sets out key findings as well as implications and recommendations to help guide these efforts. Specifically, it offers:

- In-depth empirical analysis of the two-county region's prioritized industries to identify focus subsectors and occupations with an eye toward meeting employer talent needs and improving residents' access to quality jobs, paired with practical insights from employer interviews across the five priority industries.
- Assessment of the region's current talent development system and existing gaps to be addressed based on empirical analysis, conversations with education and workforce training providers, employer input, and a review of existing economic and workforce development plans.
- Recommendations and considerations for action that balance national best practices and distinctive regional dynamics.

FOCUSING ON QUALITY JOBS

Analysis of the Central Coast reveals that nearly half of area residents—the majority of whom belong to working families—struggle to achieve self-sufficiency, defined as meeting a basic cost-of-living threshold and reserving a modest amount of income for savings. Fully 60% of the region's children belong to a struggling family. Workers of color and those with less education are significantly overrepresented in this group. Geography also matters: 38% of San Luis Obispo County's population belongs to struggling families compared to 53% of Santa Barbara County residents.

These troubling realities are attributable to a mix of regional and national dynamics. At a macro level, the United States has seen a significant contraction in middle-income jobs over recent decades due to globalization and technological change. Regionally, the Central Coast has long been anchored by industries that tend to offer lower incomes, such as agriculture and hospitality. Only one-quarter of the region's jobs count as “quality jobs,” meaning that they provide self-sufficiency incomes, offer employer-sponsored health insurance, and afford stability in retaining a quality job over the next decade. Extremely high costs of

²These industries are prioritized in the REACH 2030 plan and in the two-county Comprehensive Economic Development Strategy (also known as the Resilience Roadmap).

living in the Central Coast (particularly in Santa Barbara County)—largely due to a persistent affordable housing shortage—exacerbate the situation.

The good news is that the region can address these challenges while also improving talent availability for its priority industries. This report notes concentrations of quality jobs within each priority industry and highlights subindustries that concentrate the most quality jobs. It also highlights promising jobs that offer a pathway to a quality job within 10 years. These findings can help the region prioritize areas of focus, target populations for training and outreach, and work with employers to improve the quality of existing jobs.

WHAT INFORMS THIS RESEARCH

This report builds on extensive quantitative and qualitative research conducted over the course of 2023. Novel quantitative analysis explored a broad range of economic indicators captured in public data sources such as the U.S. Census and Bureau of Labor Statistics as well as proprietary data sets from Lightcast and Dun & Bradstreet. These analytics offer insight into past regional economic performance, industry strengths, and labor market dynamics. Qualitative research complements quantitative findings through a combination of desk research and active engagement with stakeholders from the private, public, academic, and nonprofit sectors. Conversations with area companies, institutions of higher education, workforce development intermediaries, and other key actors enabled reality-testing of quantitative findings and provided detailed insights into the situation on the ground. Taken together, these intertwined strands of research offer important findings and implications that can inform strategic talent development efforts in the Central Coast region. See additional methodology explanations in the Appendix.

NOTE ON INDUSTRY DEFINITIONS

This report uses the five industry categories set forth in the Resilience Roadmap: aerospace, precision manufacturing, agtech, cleantech, and technology. However, quantitative and qualitative analysis conducted for this report revealed that, in some cases, alternative industry classifications better describe opportunities for action. Additional insights derived from in-depth clusters research that employs machine learning to map regional supply chains and export relationships are also provided to offer supplemental views of industry dynamics, connections, and opportunities in the region.

THE CHALLENGE OF ASSESSING TALENT NEEDS



Assessing industry talent needs is a counterintuitively complicated exercise, despite the broad range of public and proprietary information available for reference. In the Central Coast region, conversations with area companies revealed that their hiring plans do not always track with macroeconomic projections for near-term job growth.

A number of factors contribute to these disconnects. Online job postings—often a key source for job openings data—can be an unreliable gauge of employer hiring activity. Use of online recruiting varies by occupation, with IT workers recruited online at a high frequency and trades workers at much lower rates. In addition, a single job posting may represent multiple openings at large companies. To further complicate matters, a growing number of companies are posting job openings simply to get intelligence on available talent and have no intention of hiring candidates who apply.

General forecasts, meanwhile, are based on historic trends rather than local insights into future talent demand. Industries like aerospace and defense closely guard information about hiring expectations in order to maintain market competitiveness and fulfill national security requirements. Smaller companies have greater difficulty projecting skills needs because they lack capacity to make accurate assessments.

These dynamics underscore the importance of collecting specific information on projected skills needs directly from companies themselves. These insights should include both current employment as well as near- and mid-term hiring projections, with specific details on experience levels, educational requirements, and whether companies expect to fill roles with new or incumbent workers. The competitive sensitivity of this information may necessitate non-disclosure agreements between convening organizations and certain employers and use of anonymized, aggregated findings.

OVERVIEW OF THE CENTRAL COAST ECONOMY



In many ways, the 2010s were a strong decade for the Central Coast. Jobs grew consistently over the decade, save for the COVID-19 pandemic, from which the region emerged with stronger-than-before employment growth.

EARNINGS, VALUE-ADDED, and average earnings also grew until 2022. Productivity accelerated between 2016 and 2021, before declining in 2022.³ This performance suggests that the region not only added jobs, but also bolstered the sophistication of the goods and services offered, and that these improvements translated to higher worker wages for much of the period.

However, underneath this high-level view, comparisons to benchmarks and review of the differential performance of distinct parts of the economy offer a more nuanced view. Growth in jobs lagged state benchmarks and productivity lagged both state and national benchmarks, suggesting that the region's positive performance could have been better. Earnings and value-added also underperformed U.S. and California benchmarks, although these measures did not deviate greatly from national trends.



³ Because employers tend to shed the least productive activities first during downturns, productivity often increases as jobs decrease and then can decline when jobs rebound.

Economic performance in the REACH region, 2012 – 2022

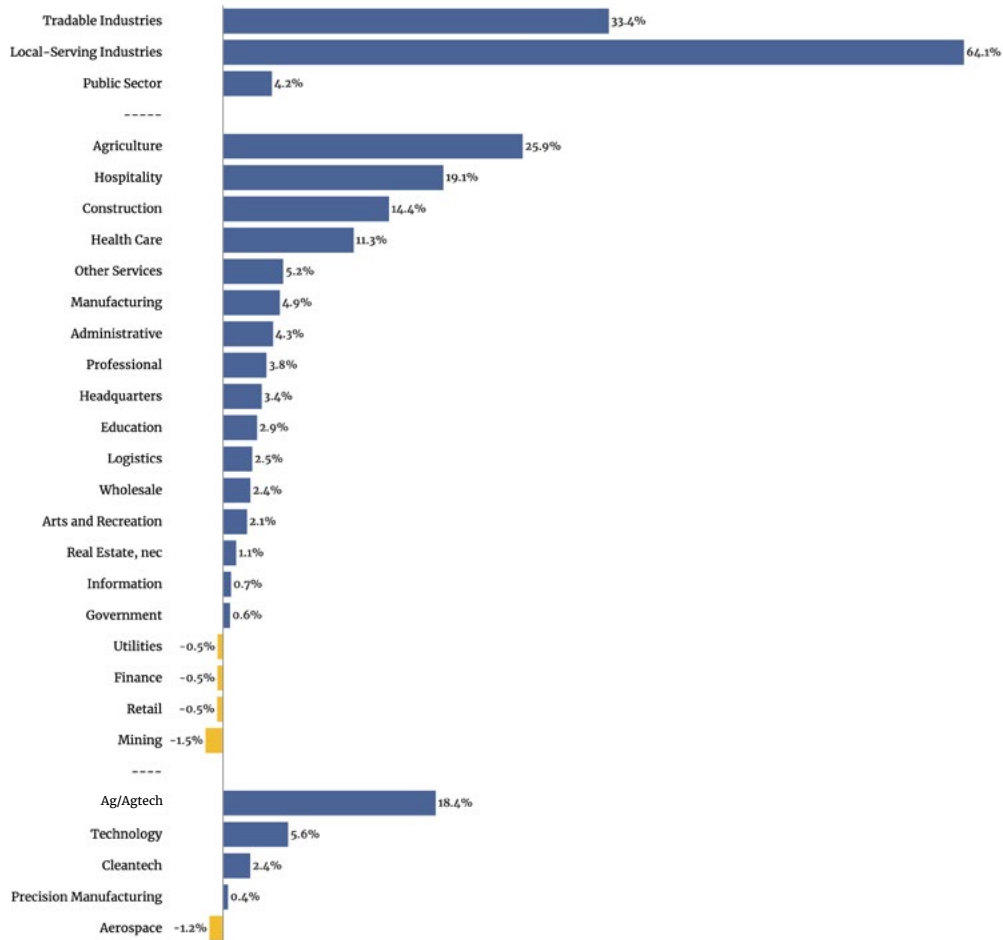


Source: Brookings and Cities GPS analysis of Lightcast estimates.

The Central Coast’s unrealized potential is largely attributable to its tradable industries. These industries produce goods and services that are exported to other U.S. and global markets, in turn importing new wealth into the region that supports a range of locally-serving activities. Tradable industries often concentrate particularly innovative activity and higher-paying jobs, reflecting their connection to global markets and expertise. However, this is not exclusively the case; a primary traded industry in the Central Coast is agriculture, which typically offers lower-paying jobs. The region’s five priority industries are all traded.

Local-serving industries accounted for some 64.1% of job growth between 2012 and 2022, while tradable industries contributed 33.4% of job growth. Of the region's various local-serving industries, hospitality, construction, and healthcare saw particularly strong employment growth. While local-serving industries typically account for more total jobs in a region, these industries also drove improvements in other measures, such as productivity and value added, over the period. In all, this suggests the need for continued attention in the region to bolstering innovative, high-value industries connected to other U.S. and global markets.

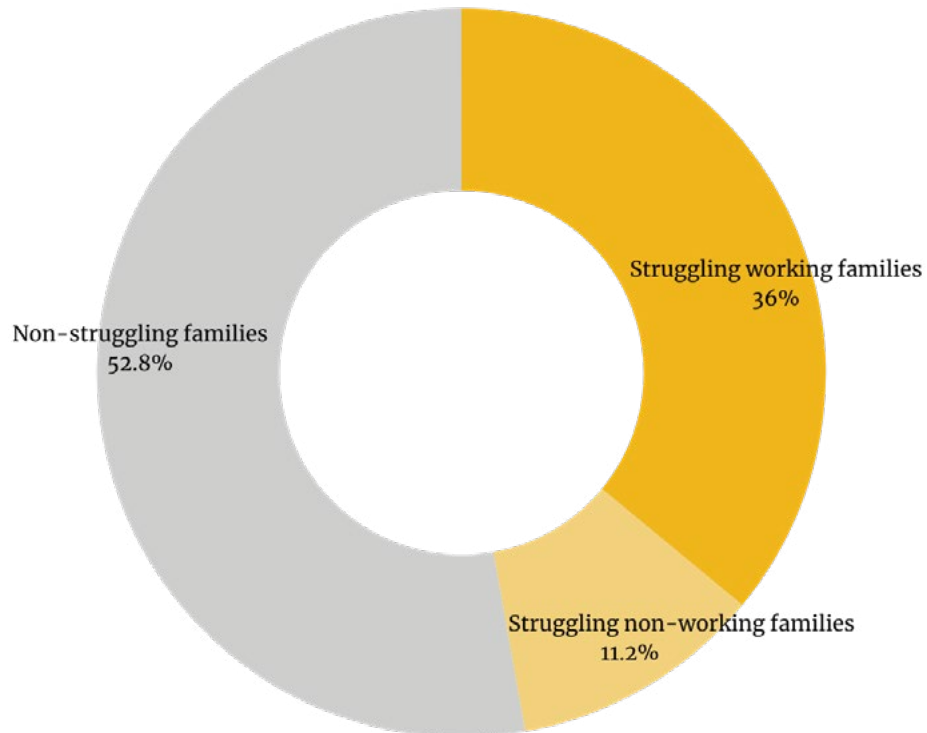
Actual share of employment growth by industry in the REACH region 2012 – 2022



Source: Brookings and Cities analysis using Lightcast Estimates

Meanwhile, even amid high-level growth, the region faces serious challenges to its ability to generate broadly-shared prosperity. Nearly half of the region's population belongs to families that struggle to earn enough to make ends meet, meaning their family's income does not cover costs of living, plus set-asides for emergency and longer-term savings.⁴ Over one-third of area residents belong to a family that does not make ends meet despite having at least one working adult, while another 11% are part of families with no adult workers (primarily families of retirement-age adults). These rates vary between the two counties. Some 38% of San Luis Obispo County's population belongs to a struggling family, compared to more than 53% of Santa Barbara County residents. This difference reflects the fact that Santa Barbara County has both higher costs of living and larger families.

Share of population in families that struggle to make ends meet in the REACH region, 2021
Members of families whose non-transfer income fell short of the self-sufficiency standard



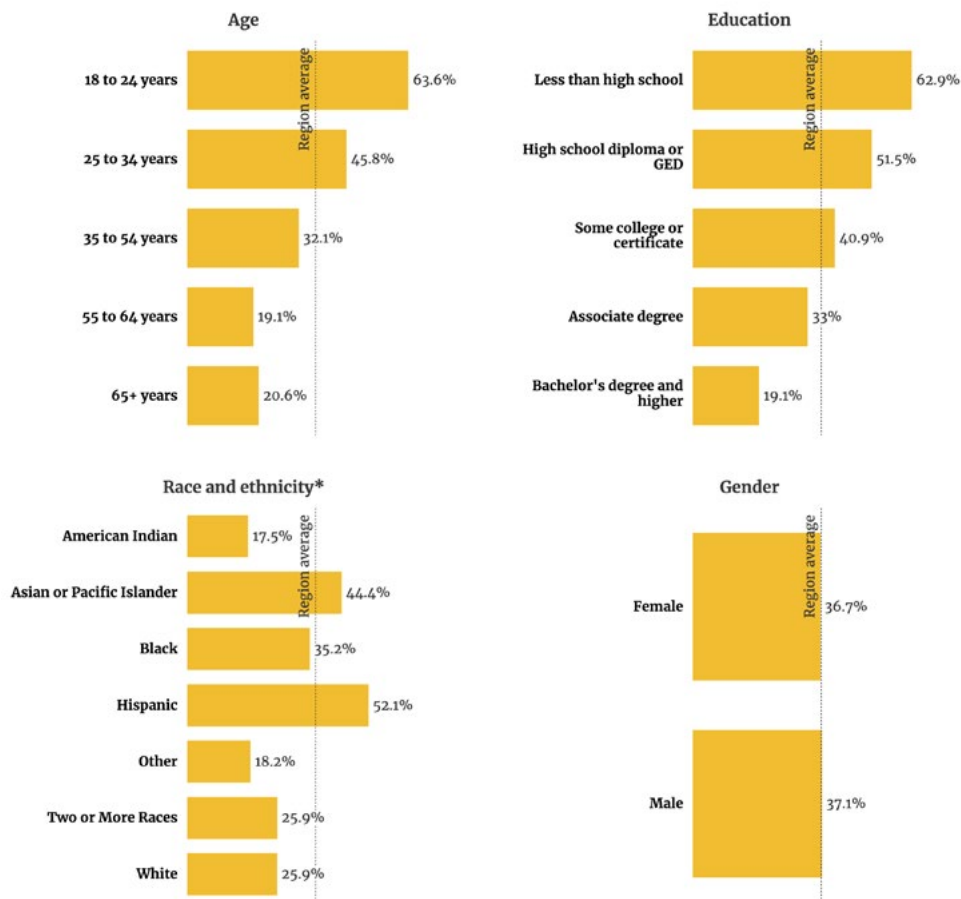
Source: Brookings and Cities GPS analysis of University of Washington Sufficiency Standard and American Community Survey 1-year public-use microdata sample, 2019 - 2021.

⁴This analysis applies the University of Washington's Self-Sufficiency Calculator, with supplements for emergency and longer-term savings. On the whole, costs are lower in San Luis Obispo County, reflecting higher housing costs in Santa Barbara County.

More concerning is the fact that children represent the largest age group on the Central Coast living in a struggling family. Almost 55% of the region's children are growing up in working families with incomes insufficient to cover basic needs. Another 7.8% belong to families struggling to make ends meet without an adult worker. Here again there are differences between the region's two counties. Just under half of children in San Luis Obispo County belong to struggling families, compared to more than 70 percent of children living in Santa Barbara County. These statistics indicate that the region faces a multi-generational challenge in terms of insufficient earnings and income. Research shows that children who grow up in resource-constrained families face sizable barriers to success as adults. Given that poverty can hinder both physical and intellectual development in children, efforts to help prime-age workers in struggling families access quality work opportunities can help both current and future generations to get ahead economically.

Share of workers in each group that struggle to make ends meet in the REACH region, 2021

Employed adults in families whose non-transfer income fell short of the self-sufficiency standard



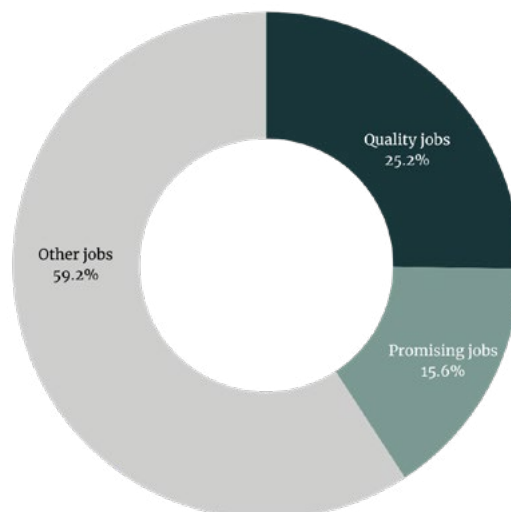
Source: Brookings and Cities GPS analysis of University of Washington Sufficiency Standard and American Community Survey 1-year public-use microdata sample, 2019 – 2021.

The proportion of workers that struggle to make ends meet varies depending upon level of educational attainment and work experience as well as race, ethnicity, gender, and other characteristics that have nothing to do with the labor market. Because industry often uses age and education as a proxy for work experience and skills training, younger workers and those with lower levels of educational attainment tend to have lower wages. This tendency holds in the Central Coast region, where younger workers (age 18–24) are over three times more likely to struggle compared to those over age 55. Likewise, nearly 70% of workers without a high school diploma struggle to make ends meet and workers with a two-year degree are twice as likely to struggle compared to those with a four-year degree.

Non-work-related factors are also closely associated with struggling status. Hispanic workers are twice as likely to struggle compared to non-Hispanic white workers, and Black and Asian workers are also more likely to have difficulty earning enough to meet their families' basic needs.

These findings elevate the importance of boosting the region's supply of jobs enabling residents to make ends meet. Analysis shows that just over a quarter of the region's jobs count as "quality jobs," meaning they offer a wage that allows families to make ends meet while accumulating some savings to build wealth over time and employer-sponsored health insurance (a proxy for other worker benefits), plus provide worker stability in terms of retaining or leading to another quality job in the future. Another 15.6% of regional jobs count as "promising jobs," meaning they offer a pathway to a quality job within a decade. The remaining 59.2% of jobs do not meet either criteria. (See "Opportunity Jobs Definitions and Methodology" below).

Share of jobs that are quality jobs in the REACH region, c. 2022



Source: Bowling and Oles GFI analysis of University of Washington Sufficiency Standard and American Community Survey 1-year public-use microdata sample, 2016–2020.

OPPORTUNITY JOBS DEFINITIONS AND METHODOLOGY

To better target inclusive economic and workforce development strategies, the Brookings Institution developed a novel Opportunity Industries analysis identifying the sectoral distributions of “quality” and “promising” jobs that enable workers to achieve self-sufficiency for themselves and their families.

While conventional economic assessments focus on average wages and measures of an industry’s prominence in a particular region, the Opportunity Industries methodology offers a granular understanding of both job quality and career progression by sector, occupation, and worker demographics. This information can help communities prioritize economic development activities that strengthen sectors that create quality jobs, improve job quality in other clusters, and improve resident access to workforce outreach and training programs.

According to the Brookings Opportunity Industries methodology, a quality job must:

- Pay an annualized living wage that allows families to make ends meet while accumulating some savings to build wealth over time
- Offer employer-sponsored health insurance (a proxy for other worker benefits)
- Provide worker stability in terms of retaining or leading to another quality job in the future

Promising jobs are those positions that do not meet all of the above criteria, but provide pathways into a quality job within ten years. This category of jobs recognizes that entry-level work often does not meet the standard of a quality job, but can help workers advance in their careers by providing opportunities to acquire the experience and skills necessary to obtain a quality job. It also accounts for the fact that most people now switch occupations and industries multiple times over the course of their working lives (as opposed to climbing a defined career ladder within a given profession, as was more common in decades past).

The Opportunity Industries analysis involves setting a wage threshold for what constitutes a quality job in a particular geography.

This involves two key inputs:

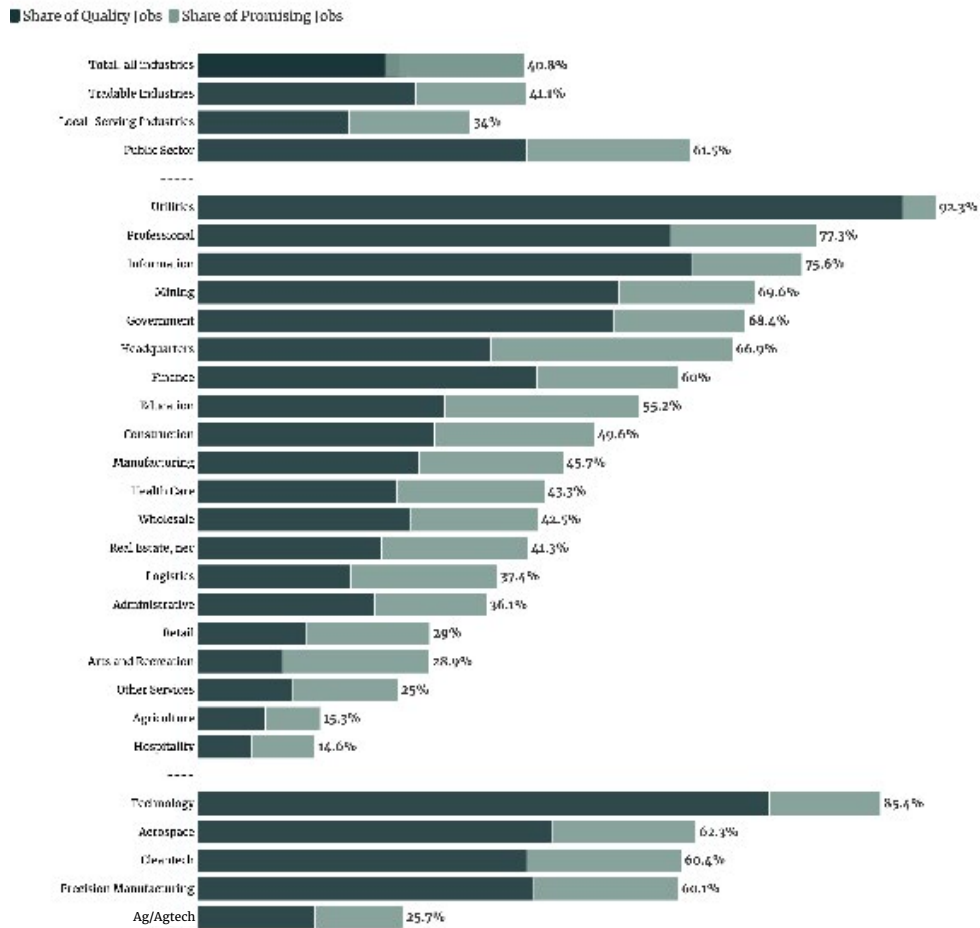
- Production of localized self-sufficiency “market basket” budgets of basic monthly expenses (e.g., housing, food, childcare, healthcare, transportation, taxes). These are derived from the University of Washington’s Self-Sufficiency Standard and enhanced with supplemental categories for emergency and longer-term savings.
- Analysis of an hourly wage curve that accounts for a wide range of family compositions and annual income needs in order to determine what proportion of the population can achieve self-sufficiency at a given income level.

The analysis in this report is based on the annual wage needed for available jobs to lift half of all struggling parents into self-sufficiency. Modeling determined that wage to be about \$70,000 a year (or about \$34.30/hour).

However, analysis shows that priority industries outperform the broader Central Coast economy in offering opportunity jobs to residents, with the exception of agtech (which is defined to include traditional agriculture).

Collectively, these trends add urgency to efforts to both accelerate the growth of priority industries and improve onramps for more residents to access the opportunity jobs they offer.

Share of opportunity jobs among the REACH region's industries, c. 2022



Source: Brookings and CIBC GPS Analysis of Lightcast estimates and American Community Survey microdata.



PRIORITY INDUSTRIES

RECENT PERFORMANCE AND TALENT NEEDS

High-tech drones monitor fields of crops as sophisticated robotics pick and package strawberries; technicians oversee this work, spared the backbreaking burden of hand-picking. Miles away, mechanics assemble and deploy wind turbines and solar installations, leveraging the region's coastal climate to test and deploy globally relevant sustainable energy solutions. Around Vandenberg Space Force Base, cutting-edge companies launch satellites and rockets serving commercial and defense customers. Tech manufacturing workers across the region program and assemble intricate software and hardware innovations.

The complexity of these industries, their connection to global markets, and their dual reliance on brainpower and highly precise, hands-on skills together create quality jobs for workers across the educational attainment spectrum. More residents, including those from historically disinvested communities that have long struggled for self-sufficiency, are able to prosper throughout the Central Coast. This is the ambition of the REACH 2030 and Resilience Roadmap plans: Bringing the region's historic economic strengths into a future-focused vision; delivering inclusive and equitable growth; prioritizing sustainability, resilience, and regional collaboration.

This report aims to bring that vision to fruition by determining where and how the region should focus its efforts to build inclusive talent pipelines that enable industry growth and expand worker access to jobs that pay well. Anchored by five overarching industry categories—aerospace, precision manufacturing, agtech, cleantech, and technology—it offers a framework for action focused on making the most of time and resources invested.



AEROSPACE



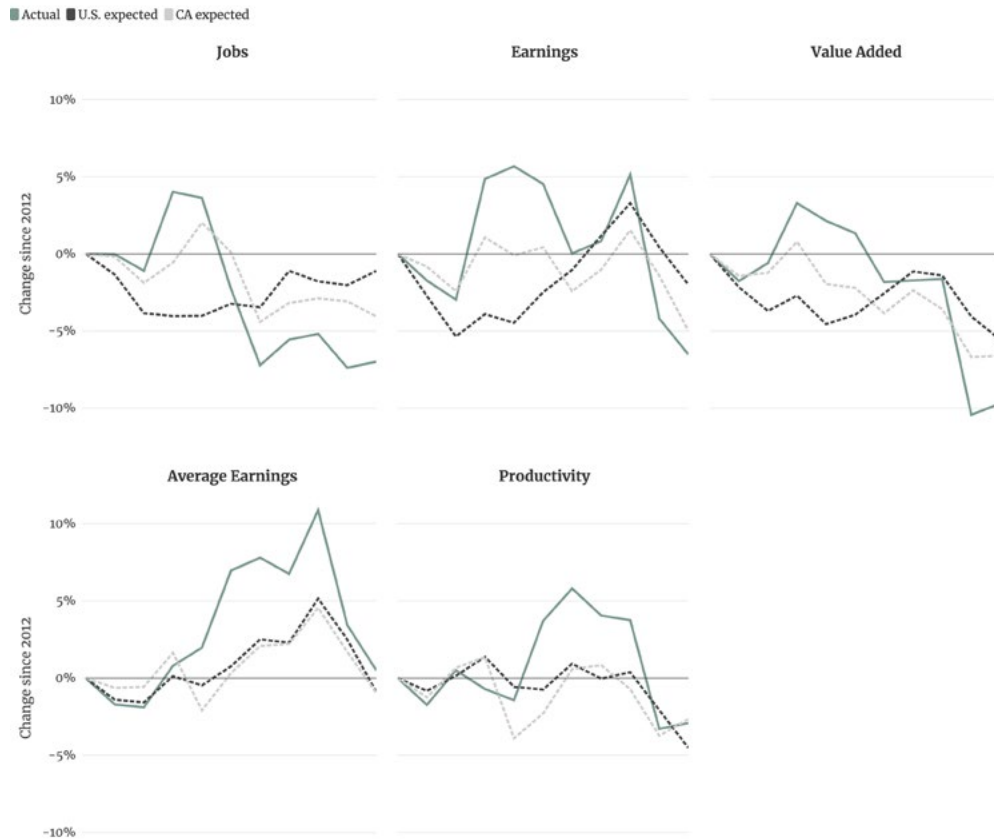
ANCHORED BY VANDENBERG Space Force Base and its distinctive vertical-launch capabilities, aerospace and defense is a historic regional industry strength rooted in Cold War missile testing that is now being adapted to the modern frontier of commercial space activity. Reflecting this transition, the region's aerospace industry is segmented in two parts: legacy aerospace manufacturing and emerging commercial space operations, which include highly complex satellite components and communications systems. Companies with regional presence include large government contractors such as Raytheon and Lockheed Martin, commercial space operators such as SpaceX, and smaller firms such as Umbra and Maverick Space Systems.



AEROSPACE | INDUSTRY PERFORMANCE

Expected versus actual economic growth over time in the REACH region, 2012 – 2022*

Expected change in the region based on national or state macroeconomic and industry trends versus the actual, measured change



Source: Brookings and Cities GPS analysis of Lightcast estimates.
*Using dynamic shift-share analysis to reduce sensitivity to choice of start year and inter-year shifts.

IN THE AGGREGATE, the region's aerospace industry stumbled between 2012 and 2022, tracking with tumultuous trends at the state and national levels. During this period, U.S. and California industry benchmarks saw negative growth in jobs, payroll, value-added, and productivity as well as a decline in average earnings.⁵ However, evidence suggests that much of this regional decline stemmed from a single recent corporate decision—the 2020 closure of Santa Maria-based Safran's airplane seat manufacturing operations.⁶ This action eliminated 300 aerospace jobs in the Central Coast. The decline in aerospace presence in Santa Barbara County despite improvements in average wages and productivity likely resulted from this closure, while San Luis Obispo County experienced growth despite its smaller footprint.

⁵ Value added measures net revenue (the price paid by the consumer less the cost of producing the good or service sold)

⁶ See Anikka Abbott and Travis Schlepp, "Aerospace company Safran to layoff 300 employees in Santa Maria," KEYT, June 19, 2020, <https://keyt.com/news/santa-maria-north-county/2020/06/19/aerospace-company-safran-to-layoff-300-employees-in-santa-maria/>.

Reflecting the sophistication of the industry, 44% of aerospace jobs (some 2,160 positions) qualify as quality jobs. This proportion is significantly above the regional average of 25.2% of jobs meeting the quality jobs bar. A greater number of these positions are located in Santa Barbara County (1,878), with the remainder (281) in San Luis Obispo County. An additional 17.8% count as promising jobs, meaning they provide a pathway to a quality job within ten years.

Subindustries such as aircraft engine and engine parts manufacturing, aircraft manufacturing, other measuring and controlling device manufacturing, and guided missile and space vehicle manufacturing are among those offering the highest concentrations of quality jobs. Aerospace jobs also exceed the regional average in providing quality jobs for workers of all levels of education.

Despite Vandenberg's presence as a highly visible anchor for the region's aerospace industry, interviews with employers suggests that at least some firms see their presence in the Central Coast as largely historical or incidental and are now more closely tied to other regions due to customer and / or supplier relationships. These connections to industry hubs such as Huntsville, Alabama, and Denver, Colorado, are advantageous in that they expose these companies to new market trends and opportunities. However, a lack of relationships with local suppliers and customers and the absence of a corporate identity tied to the Central Coast could indicate unrealized opportunities among regional industry actors—or risks. Without strong business ties to the region, firms may forego further investment in the region or could disinvest. These findings reinforce the importance of REACH's existing aerospace cluster-building efforts.

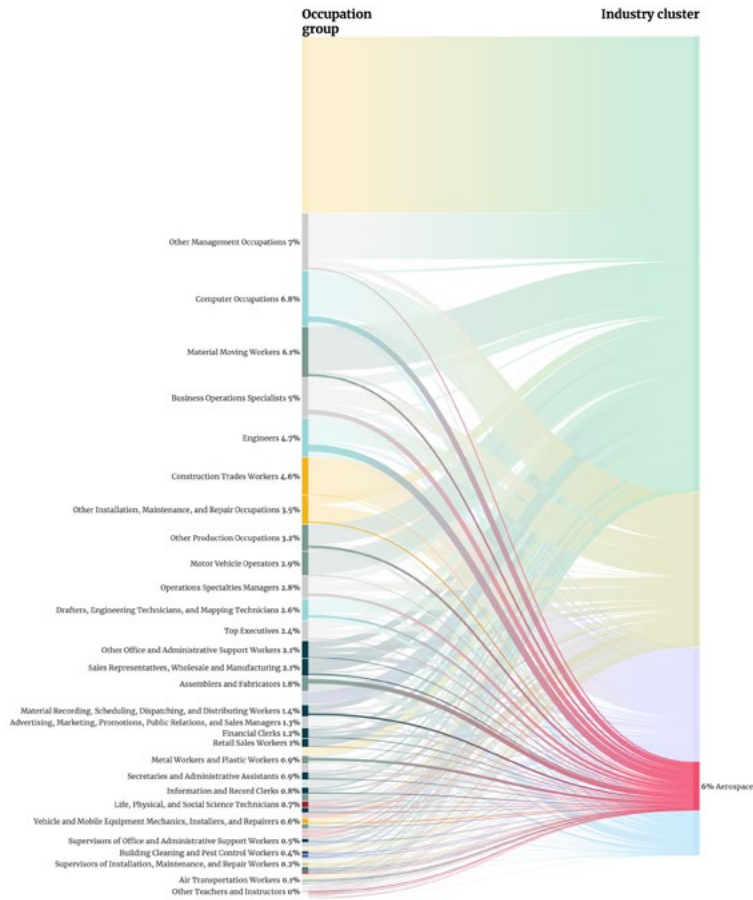
LOOKING AHEAD, economic projections for the aerospace industry's jobs growth in the Central Coast region and throughout California indicate only modest job growth over the coming decade. Job openings may be more plentiful, however, due to retirements and other labor turnover. The industry's forecasted job growth and job openings contrasts with bullish employer sentiment, though, reinforcing the need for localized data collection to determine the scale, pace, and nature of future demand for talent.



AEROSPACE | TALENT NEEDS AND IMPLICATIONS

Share of priority cluster jobs by occupation and cluster in the REACH region

Occupation Group: ■ Computer, Engineering, and Science ■ Education, Legal, Community Service, Arts, and Media ■ Healthcare Practitioners and Technicians ■ Management, Business, and Finance ■ Natural Resources, Construction, and Maintenance ■ Production, Transportation, and Material Moving ■ Sales and Office ■ Service



Source: Brookings analysis of American Community Survey Public-Use Microdata Sample and Lightcast estimates.

THE REGION'S AEROSPACE industry requires a mix of highly educated hardware and software engineers and mid-skill technicians who design and assemble complex products. Within this industry, the most common occupations are engineers (480 positions), computer occupations (381 positions), business operations specialists (326 positions), and assemblers and fabricators (318 positions). Aerospace occupations require sophisticated technical skills, with quality jobs typically demanding installation, programming, technology design, operations analysis, and knowledge in engineering and technology.

AEROSPACE EMPLOYERS DESCRIBE a two-part talent challenge that aligns with the occupational makeup of the industry. While entry-level roles requiring a four-year degree can typically be filled by local higher education institutions such as Cal Poly, mid-career and senior engineering talent is very difficult to procure. It can take companies a year or more to find suitable candidates for specialized roles.

Employers attribute these hiring challenges to two issues. One is the region's low housing supply and high housing costs, which make it hard for families to find or afford housing even with pay packages that exceed industry averages. Another issue is finding work for the spouses and partners of new hires—a common challenge for small and mid-sized regions like the Central Coast. As a result, some companies have begun to move software engineering roles that do not require immediate proximity to production to other regions with denser talent pools, such as Phoenix, Arizona, Atlanta, Georgia, and Austin, Texas. Other companies describe having to “make do” with less-skilled talent than they might otherwise find in major innovation hubs, which can have a negative effect on productivity and competitiveness.

While the region's specialization in complex hardware components assembly (i.e., precision manufacturing) remains intact, the relocation of some skilled occupations to other regions highlights the danger that the Central Coast's cost of living issues poses to its economic future. Absent policy action to address the persistent housing shortage, shared regional talent recruitment strategies may help alleviate the burden on individual firms but are unlikely to close the gap entirely.

Conversely, mid-skill technical roles that do not require a four-year degree are relatively easy to fill at entry level, though these positions are also becoming more competitive in terms of recruitment and retention. Employers report that successful candidates tend to be “tinkerers” who are adept at manipulating complex parts as opposed to workers with specific academic training. Once hired, these workers are trained to meet company skills needs.

The willingness of employers to hire workers without traditional degrees suggests that opportunities exist to improve access to quality jobs by leveraging subsidized work-based learning programs and targeting outreach and support to better serve workers from disconnected populations. ACI Jet's partnership with Cuesta College to train aviation maintenance technicians is emblematic of potential solutions.

PRECISION MANUFACTURING



THE REGION'S PRECISION MANUFACTURING INDUSTRY

reflects the evolution of California manufacturing from an older, slower-growing metals and machinery base to smaller but faster-growing high-tech semiconductor and cleanroom industries.

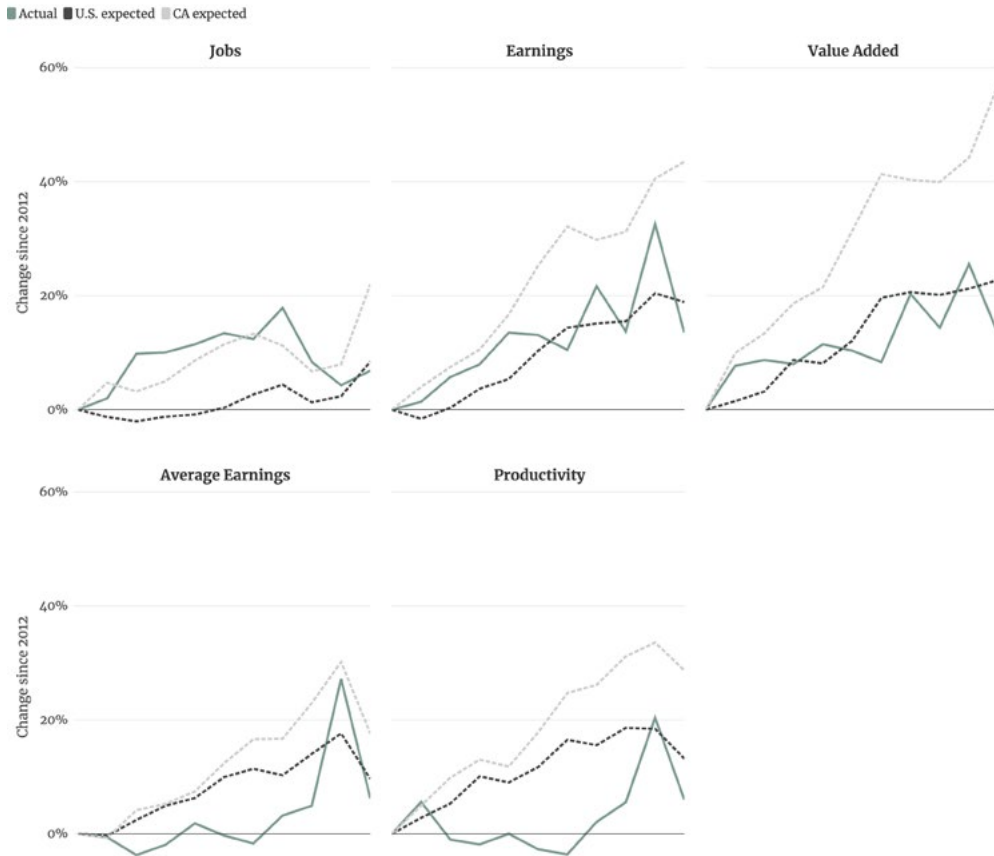
Precision manufacturing saw nearly 7% job growth between 2012 and 2022, exceeding U.S. benchmarks but falling short of California (22%). Earnings, value-added, average earnings, and productivity all were positive over the 10-year period, though these indicators also lagged state benchmarks. Across many of these measures, Santa Barbara County—home to the region's cluster of semiconductor and cleanroom companies—saw positive growth while San Luis Obispo County experienced negative growth.



PRECISION MANUFACTURING | INDUSTRY PERFORMANCE

Expected versus actual economic growth over time in the REACH region, 2012 – 2022*

Expected change in the region based on national or state macroeconomic and industry trends versus the actual, measured change



Source: Brookings and Cities GPS analysis of Lightcast estimates.

*Using dynamic shift-share analysis to reduce sensitivity to choice of start year and inter-year shifts.

SOME 43% OF precision manufacturing jobs (1,286 positions) qualify as quality jobs, vastly outperforming the regional average. Of these positions, 1,007 are located in Santa Barbara County and 279 are in San Luis Obispo County. Subindustries such as audio and video equipment manufacturing, computer terminal and other computer peripheral equipment manufacturing, electronic computer manufacturing, and radio and television broadcasting and wireless communications equipment manufacturing deliver the highest rates of job quality. In some subindustries, quality jobs represent two-thirds to three-quarters of all jobs. As in aerospace, precision manufacturing outperforms the regional average in offering quality jobs to workers at all levels of educational attainment. A further 18.2% qualify as promising jobs, offering a pathway to a quality job in 10 years.

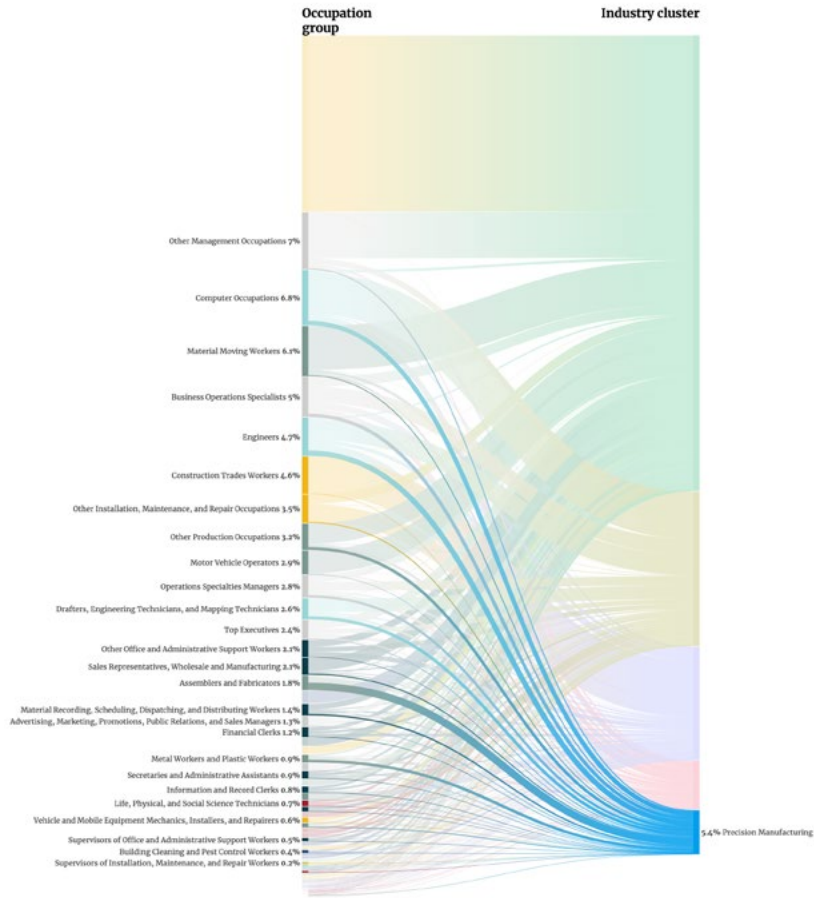
PRODUCTION THAT HAS remained in California despite the significant cost and regulatory challenges involved tends to be knowledge- and value-intensive, located close to hubs of innovation, or requiring proximity to inputs (e.g., processing perishable or heavy agricultural crops into food products). Semiconductor and cleanroom manufacturing are emblematic of the future of California production and rely heavily on the region's strong innovation assets, such as the University of California, Santa Barbara. Metals and machinery, by contrast, represents production activity that is becoming less competitive in the state as a whole. Industry activity related to semiconductors and cleanrooms includes Google's Santa Barbara Quantum AI campus (with its close historical ties to UC Santa Barbara) and semiconductor companies such as Aeluma, Atomica, Raytheon, Teledyne FLIR, and Transphorm. Although these companies are largely concentrated between Santa Barbara and Goleta, San Luis Obispo County is home to supply chain companies such as Trust Automation and Mantis Composites.



PRECISION MANUFACTURING | TALENT NEEDS AND IMPLICATIONS

Share of priority cluster jobs by occupation and cluster in the REACH region

Occupation Group: ■ Computer, Engineering, and Science ■ Education, Legal, Community Service, Arts, and Media ■ Healthcare Practitioners and Technicians ■ Management, Business, and Finance ■ Natural Resources, Construction, and Maintenance ■ Production, Transportation, and Material Moving ■ Sales and Office ■ Service



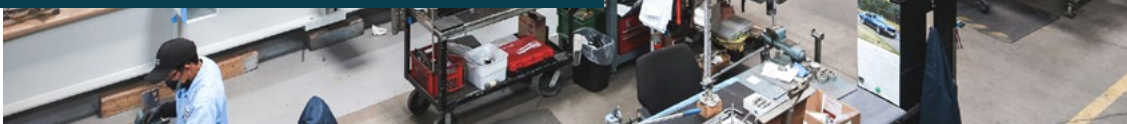
Source: Brookings analysis of American Community Survey Public-Use Microdata Sample and Lightcast estimates.

PRECISION MANUFACTURING TALENT needs overlap with aerospace, reflecting the interconnections between these two industries (see Sector Nexus for Refined Focus: Precision Manufacturing and Autonomous Systems). Among Central Coast precision manufacturing jobs, the most common occupations are assemblers and fabricators (510 positions), engineers (369 positions), and computer occupations (311 positions). Top human capital characteristics demanded by quality jobs in the industry are installation, programming, engineering and technology, technology design, and design.

AS IN AEROSPACE, priority roles are segmented into higher-skill engineering positions and a mid-skill technician workforce adept at precise “touch labor,” which includes moving and packaging silicon wafers, assembling cryostats, and handling other high-value components. Cleanroom processes are typically highly prescribed and often bespoke to individual companies, requiring on-the-job training that builds on workers’ existing baseline of technical capabilities. In the Santa Barbara area, a lack of mid-skill technicians has forced some companies to rely on PhD-level scientists and engineers perform these lower-skill duties, which in turn limits their ability to focus on the high-value activities for which they were trained.

Existing collaborations between companies and education partners provide a foundation for additional action to address this mid-skill technician shortage. These efforts include the Central Coast Partnership for Regional Industry-focused Micro/Nanotechnology Education (CC-PRIME) led by UC Santa Barbara and Santa Barbara City College, the planned Advanced Manufacturing Upskilling Network led by the Santa Barbara South Coast Chamber in conjunction with education, workforce, and industry partners, and SLO Partners’ Modern Manufacturing bootcamp. These programs aim to improve access to higher-quality jobs, with particular attention to workers from historically underrepresented groups and those in lower-paying industries.

AS IN AEROSPACE, precision manufacturing employers report that costs and talent availability have prompted a split in the location of hardware and software functions, with software workers increasingly located outside the region. While specialized employees are willing to relocate in the region for field-leading work (e.g., in quantum), recruitment for more general engineering and software talent faces challenges similar to those in other industries.



TECHNOLOGY



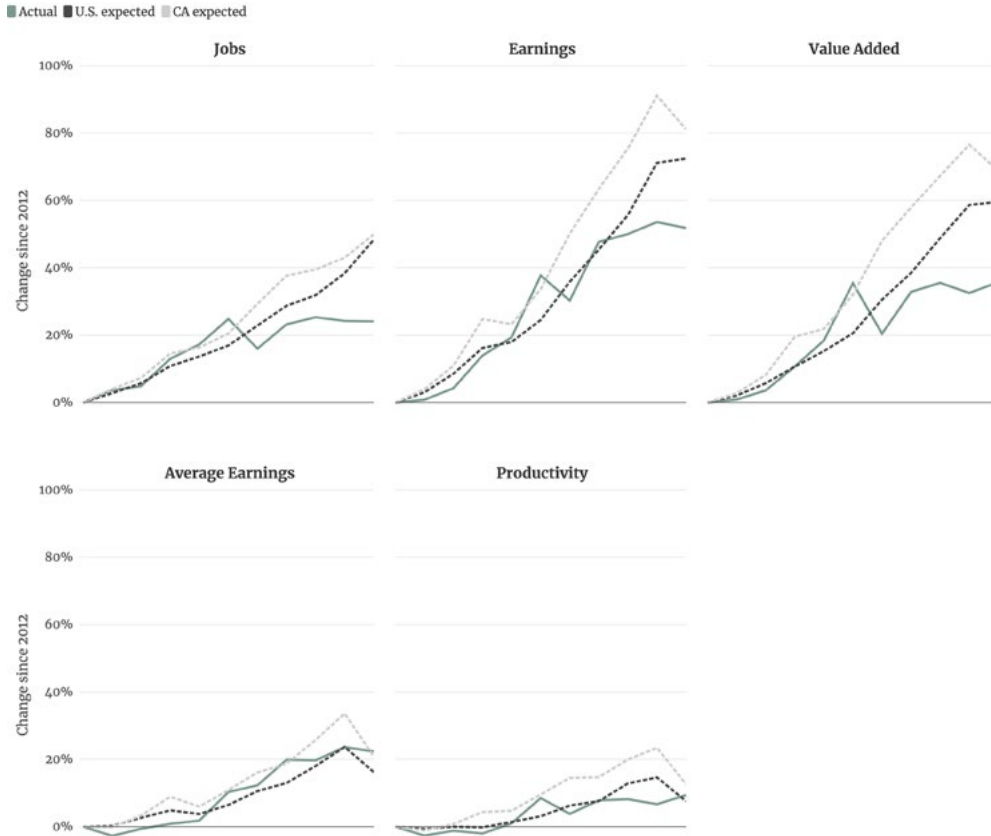
“TECHNOLOGY” REFERS TO industries that deal with the design and encoding of computer and other automated systems, spanning IT system management to smartphone apps to artificial intelligence (AI). In the Central Coast region, this industry focuses primarily on services, such as software publishing, data processing, and web search processing. The industry includes major companies such as Amazon, which has development offices for its Alexa product line in Santa Barbara (the result of a 2017 acquisition of Santa Barbara-based Graphiq) and Kindle Direct Publishing in San Luis Obispo, as well as Microsoft offices serving LinkedIn’s Lynda platform.



TECHNOLOGY | INDUSTRY PERFORMANCE

Expected versus actual economic growth over time in the REACH region, 2012 – 2022*

Expected change in the region based on national or state macroeconomic and industry trends versus the actual, measured change



Source: Brookings and Cities GPS analysis of Lightcast estimates.

*Using dynamic shift-share analysis to reduce sensitivity to choice of start year and inter-year shifts.

THE INDUSTRY GREW by double digits across most measures between 2012 and 2022, with jobs increasing by 24%, value-added by almost 36%, and payrolls by nearly 52%. Although the industry underperformed national benchmarks, this probably reflects the fact that other U.S. regions are rapidly catching up with California's early technology adoption as opposed to troubling signs regarding the region's competitiveness. Technology grew faster in San Luis Obispo County than in Santa Barbara County for much of this period, expanding on its smaller pre-existing base.

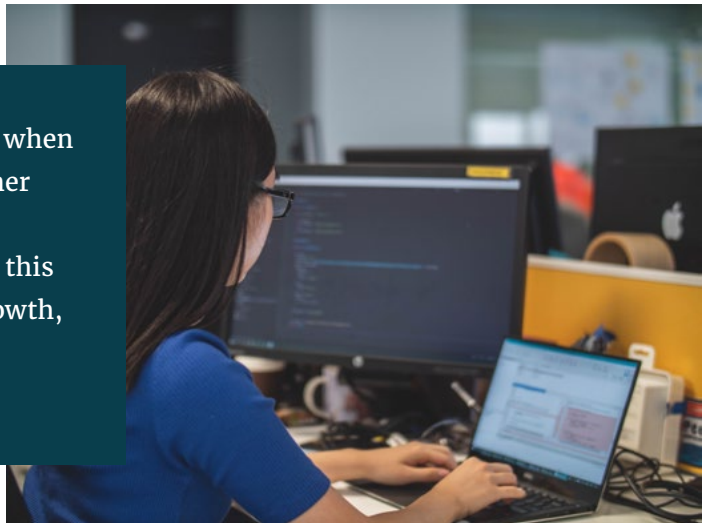
Of all jobs in the technology industry, 71.4% (about 9,000 in total) qualify as quality jobs. Santa Barbara County accounts for a larger share (73.8%) and a higher number (7,087) of quality technology jobs, outperforming San Luis Obispo County in both categories.

This reality may reflect more sophisticated technology activity in Santa Barbara County, which offers a greater number and proportion of positions that command higher wages. Subindustries offering the most quality jobs include software publishing (particularly in Santa Barbara County), computer systems design services, computer facilities management services, custom computer management services, and data processing, hosting, and related services which are more prominent in San Luis Obispo County. A further 13.9% qualify as promising jobs, offering a pathway to a quality job in 10 years.

Technology also dramatically outperforms most other industries in terms of workers' access to quality jobs. About 43% of 18-to-24-year-old tech workers hold a quality job. This improved access applies across the spectrum of educational attainment, with quality jobs representing nearly 42% of positions held by those with a high school diploma or GED, over 50% for those with some college or a certificate, and more than 60% for those with an associate degree. Notably, nearly 66% of Hispanic workers in technology hold a quality job, compared to 13% in the regional economy; by contrast, only 6% of Black technology workers hold a quality job, compared to nearly 26% in the regional economy.

The presence of Amazon's Alexa division, Google Quantum (which overlaps with precision manufacturing), and other companies employing AI, machine learning, and autonomous systems technology points to a more specific regional specialization within the broad category of "technology." (See "Sector Nexus for Refined Focus: Precision Manufacturing and Autonomous Systems" for further discussion). Engagement with area companies revealed demand for specialized positions such as ontology/knowledge engineers who organize information for queries and applied scientists who are well-versed in AI and machine learning, which affirms this trend toward greater industry specialization.

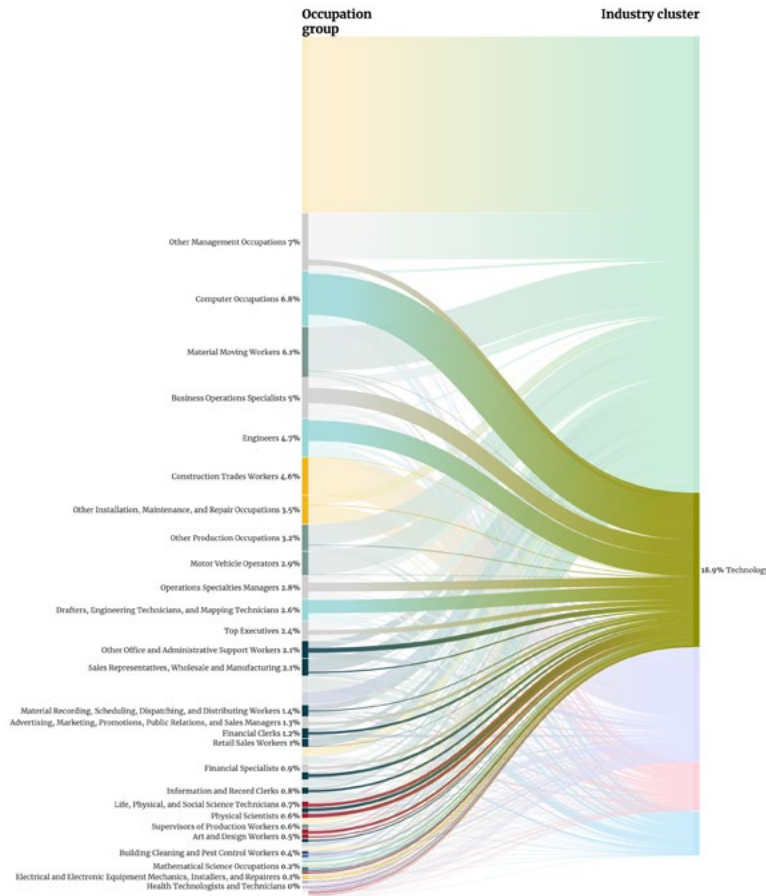
ONGOING GROWTH IN THIS INDUSTRY, when combined with technology needs in other industries, will likely continue to drive significant demand for talent. Meeting this need is a prerequisite for continued growth, reinforcing the importance of a strong, industry-aligned talent pipeline.



TECHNOLOGY | TALENT NEEDS AND IMPLICATIONS

Share of priority cluster jobs by occupation and cluster in the REACH region

Occupation Group: ■ Computer, Engineering, and Science ■ Education, Legal, Community Service, Arts, and Media ■ Healthcare Practitioners and Technicians ■ Management, Business, and Finance ■ Natural Resources, Construction, and Maintenance ■ Production, Transportation, and Material Moving ■ Sales and Office ■ Service



Source: Brookings analysis of American Community Survey Public-Use Microdata Sample and Lightcast estimates.

AMONG THE REGION'S technology jobs, the most common occupations are computer occupations (2,835 positions), engineers (1,405 positions), and business operations specialists (1,069 positions). As is the case for aerospace and precision manufacturing, quality jobs in the industry demand skills in programming, technology design, installation, and science, as well as knowledge in engineering and technology.

TECHNOLOGY COMPANIES, LIKE other employers in the region's priority industries, struggle to retain and recruit experienced skilled workers due to high costs of living and other issues, such as opportunities for the partners of new hires. Regional companies also point to the lack of a cohesive regional tech ecosystem that offers opportunities for workers to move within the industry—as is the case in the Bay Area—as a barrier to external recruitment.

Employers report that they can source entry-level technology talent in a relatively reliable manner from Cal Poly and UC Santa Barbara. Some companies also indicated that skills developed in boot camps and short-term programs could suffice for some entry-level roles.

These dynamics signal the importance of training and recruiting local residents, who are more likely to remain in the region. Amazon's Junior Developer partnerships with UC Santa Barbara and Cal Poly are emblematic of potential approaches. This program builds relationships with students via multiple work-based learning experiences, ultimately leading to full-time employment. However, reaching greater scale and improving local access to quality jobs will require additional interventions, which may include K-12 STEM career awareness programming, focused engagement with those who have been historically underrepresented in the tech economy, and further identification of the skills and credentials short of a four-year degree that provide sufficient preparation for industry work.

AGRICULTURE TECHNOLOGY



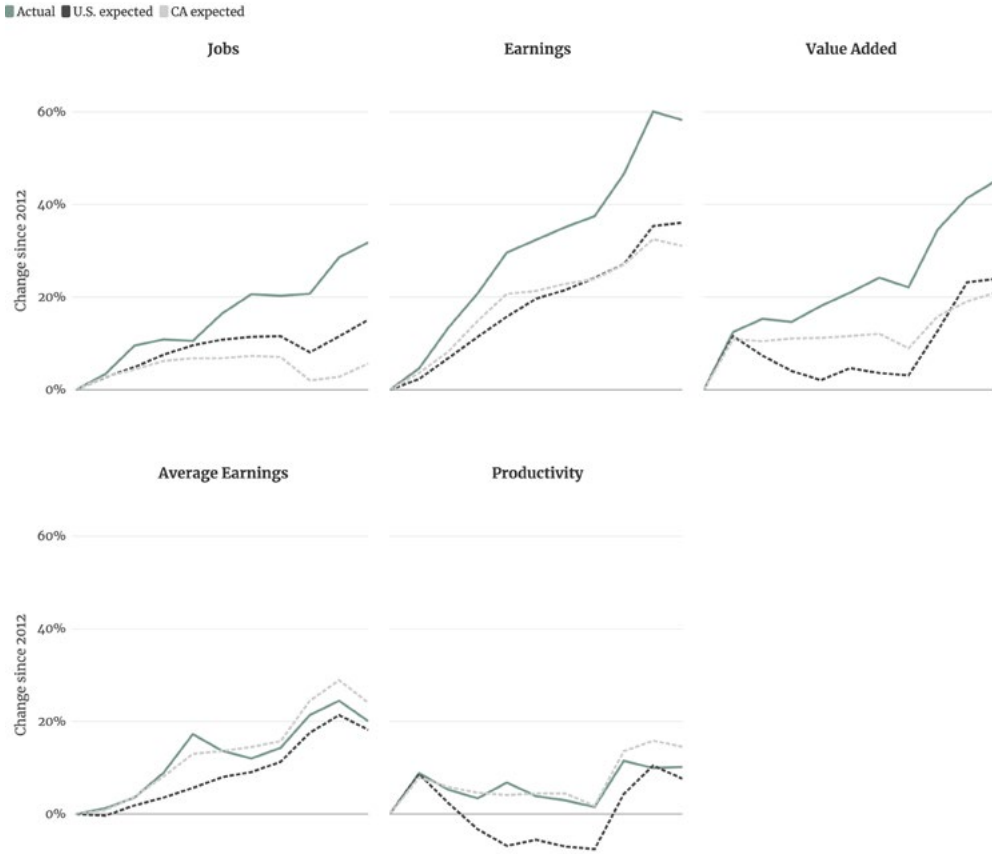
THE REGION'S "AGRICULTURE TECHNOLOGY" INDUSTRY

is better understood as a massive cluster of food and agriculture companies dominated by agricultural production and farm management. While companies in the region's agriculture and food manufacturing industries are undoubtedly innovative in terms of both their production and business operations, most are not exclusively in the business of developing and selling new technologies for agriculture or food. While several of those types of companies are known to be headquartered in the Central Coast region, others are harder to identify.



AGRICULTURE TECHNOLOGY | INDUSTRY PERFORMANCE

Expected versus actual economic growth over time in the REACH region, 2012 – 2022*
 Expected change in the region based on national or state macroeconomic and industry trends versus the actual, measured change



Source: Brookings and Cities GPS analysis of Lightcast estimates.
 *Using dynamic shift-share analysis to reduce sensitivity to choice of start year and inter-year shifts.

TRADITIONAL AGRICULTURE IS a massive driver of the region’s economy. From 2012 and 2022, the industry saw job growth of nearly 32% (albeit potentially attributable to hiring prompted by state policy changes that capped individual worker hours as opposed to expansion in activity overall). During the same period, industry earnings and value-added grew rapidly in excess of state and national trends, affirming the sophistication of the industry and its foothold in grass-fed beef, strawberries, wine, and other specialized goods.

HOWEVER, WHILE THE industry is a major source of employment, the low wages earned by a large proportion of the industry's workforce contribute significantly to the region's high share of struggling workers and families. Only about 15% of jobs in this industry meet the criteria for a quality job. The proportion of quality jobs is even worse for workers with less than a high school diploma, who represent the majority of the region's agricultural workforce. For these workers, a mere 2.57% of jobs qualify as quality jobs. Only an additional 11% count as promising jobs, offering a pathway to a quality job in 10 years. Although the food and agriculture industry is the largest driver of job growth among the five priority industries, low job quality currently inhibits the industry's ability to serve as an engine of economic mobility.

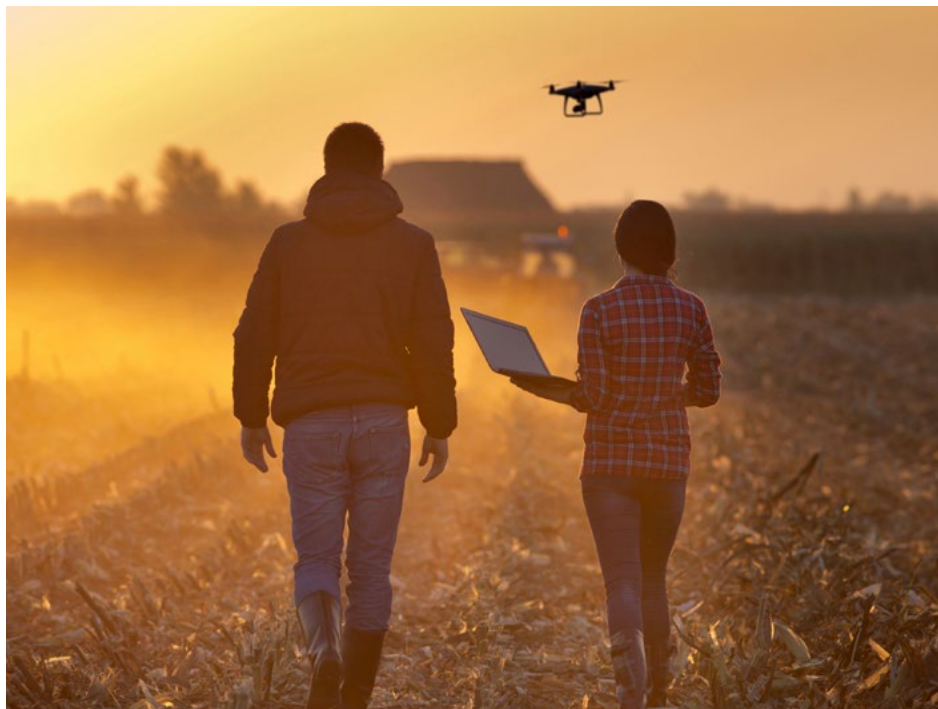
Certain subindustries, such as research and development in biotechnology and farm machinery and equipment manufacturing, boast much higher levels of job quality. However, the region's more dominant subindustries—farm management; crop production; wineries; distilleries; most food manufacturing—have job quality shares at or below the industry average.

Although the cluster does feature a smaller number of higher-skill roles that command higher wages, those are largely inaccessible to the region's struggling workers. These better-paying occupations include engineers, business operations specialists, computer occupations, executives, and sales and other business support functions. Mid-skill roles include drafters, engineering technicians, and mapping technicians; motor vehicle operators; and other management and production roles. The share of associate degree holders who have a quality job in the industry is nearly 40%; the share for workers who hold a bachelor's degree or higher is over 50%.

The region's pivot to agriculture technology development is logical, but more aspirational at this point in time. Compared to other agricultural regions of California, the Central Coast has relatively few true agtech companies. In the short-term, technology adoption could improve the productivity and resilience of agricultural production and upgrade job quality for a subset of the workforce. Industry input suggests that an organized approach to connecting farms to technology solutions (as opposed to the current method of ad hoc referrals and word of mouth) would accelerate technology adoption and industry development.

Longer-term advantages for technology development include density of agricultural production, which enables significant opportunities for partnering with farmers for testing and demonstration. The region's base in technology and unmanned systems (a component of aerospace and precision manufacturing) also serve as a foundation for innovation. In addition, Cal Poly—one of the nation's leading agriculture schools—and research centers such as the Strawberry Center already act as hubs of innovation, offering a distinctive competitive edge for the Central Coast. Companies such as Hortau in San Luis Obispo, Andros Engineering in Paso Robles, and TRIC Robotics in Santa Maria embody this potential as agtech startups that located in the region to test and scale innovations focused on strawberry and wine crops.

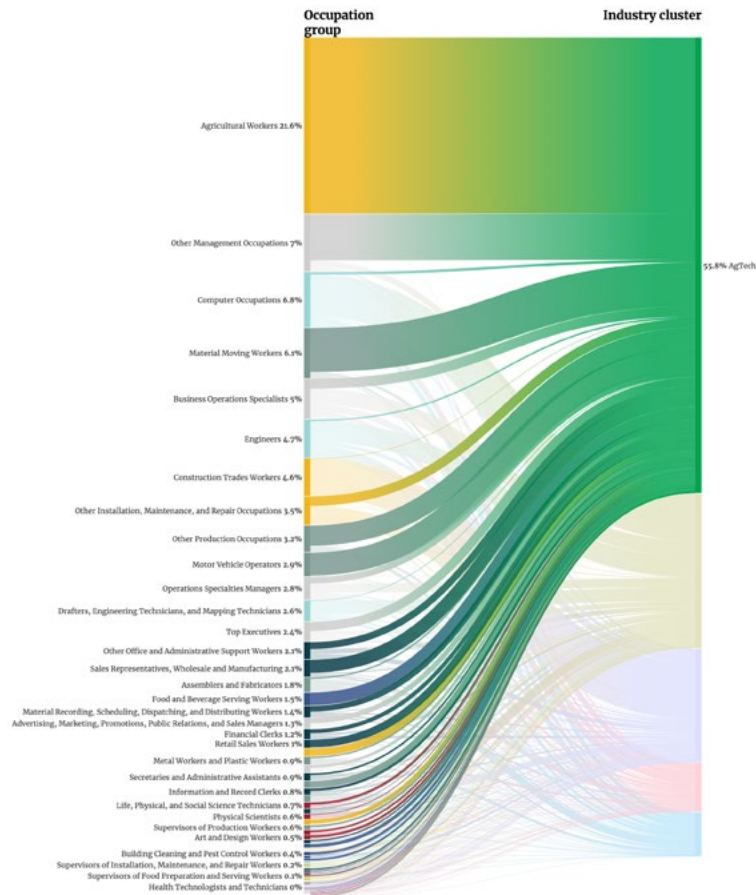
Despite these advantages, the region will face competition with incumbents from other California regions such as Salinas and other national and international agtech hubs, such as St. Louis, Missouri, and the Netherlands. Business leaders also suggested that capital access challenges, lack of a strong regional identity, and limited connections among existing agtech companies hamper growth, indicating the need for ecosystem-building interventions.



AGRICULTURE TECHNOLOGY | TALENT NEEDS AND IMPLICATIONS

Share of priority cluster jobs by occupation and cluster in the REACH region

Occupation Group: ■ Computer, Engineering, and Science ■ Education, Legal, Community Service, Arts, and Media ■ Healthcare Practitioners and Technicians ■ Management, Business, and Finance ■ Natural Resources, Construction, and Maintenance ■ Production, Transportation, and Material Moving ■ Sales and Office ■ Service



REFLECTING THE CURRENT focus of the industry, agricultural workers are the largest share of the agtech workforce, accounting for 12,113 positions. Employers in agricultural production report that agricultural workers increasingly need STEM skills such as robotics maintenance, which suggests momentum for agtech adoption is growing. Upskilling the agricultural workforce for these new tasks, perhaps following models such as Fresno’s Agri-food Technology & Engineering Collaborative (AgTEC), could help ensure that farm operations have access to the skilled workers they need to advance technology adoption.

Agriculture technology development will require engineering and software talent, which is also in high demand in the region’s other priority industries. This fact reinforces the imperative to improve regional pathways into these occupations.

CLEAN TECHNOLOGY



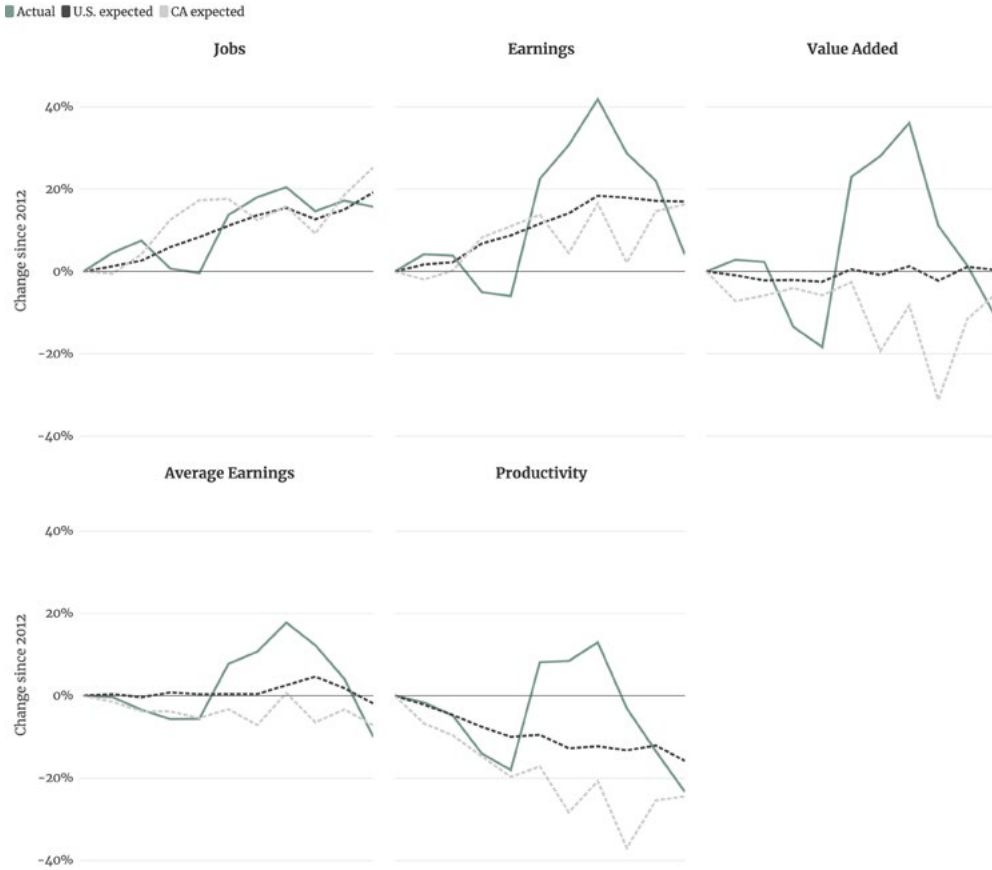
THE CENTRAL COAST is undergoing an impending transformation in its energy industry. For decades, the Diablo Canyon nuclear power plant has been a primary energy source for the state, as well as an anchor employer and source of quality jobs. Its eventual shutdown in the coming years, along with the continued closure of oil and gas power plants, refineries, and production facilities will take key sources of energy offline, along with thousands of high-wage jobs. Meanwhile, once-in-a-generation climate investments and incentives at the state and federal levels are creating new possibilities for the Central Coast. The region is the site for a number of energy storage project proposals and is well-positioned to compete for significant clean energy investment in offshore wind.



CLEAN TECHNOLOGY | INDUSTRY PERFORMANCE

Expected versus actual economic growth over time in the REACH region, 2012 – 2022*

Expected change in the region based on national or state macroeconomic and industry trends versus the actual, measured change



Source: Brookings and Cities GPS analysis of Lightcast estimates.
 *Using dynamic shift-share analysis to reduce sensitivity to choice of start year and inter-year shifts.

NOTWITHSTANDING THE REGION'S strong history in energy production, analysis reveals that cleantech does not yet constitute a cohesive cluster connected by supply chains and export relationships. Rather, as currently defined, the region's cleantech industry encompasses a broad array of distinct activities, including power generation, irrigation systems construction, air conditioning installation, and environmental services.

THIS SUGGESTS THE need for ongoing economic development efforts ahead of talent development; opportunities may include the long-term possibility of capturing value from proposed offshore wind activity, the future re-use of the Diablo Canyon industrial site, and the broad-based electrification and energy efficiency retrofitting needed to meet state climate standards. Analysis of the region's innovation assets, such as research activity underway at UC Santa Barbara and Cal Poly, also finds strengths in disciplines such as marine biology, oceanography, and engineering, offering further foundation for clean tech innovation.⁷

Current industry performance is dominated by utilities, particularly given the relatively low scale of other activities. Jobs grew nearly 16% between 2012 and 2022 but underperformed benchmarks, while most other measures experienced declines. Santa Barbara County generally saw weaker performance than San Luis Obispo County. Employers include Pacific Gas & Electric, SoCal Gas, and Central Coast Community Energy.

At present, 41% of jobs (about 3,000 positions) in this industry qualify as quality jobs, with more located in San Luis Obispo County (1,864 positions) than in Santa Barbara County (1,214 positions). Job quality varies significantly within the industry, with multiple categories of power generation—biomass electric, hydroelectric, solar, nuclear, and others—boasting proportions of quality jobs that exceed 85%. Conversely, subindustries such as plumbing, heating, and air conditioner contractors, roofing contractors, and prefabricated wood building manufacturing see rates of 25% or below.⁸ An additional 19.2% of cleantech jobs count as promising jobs, offering a pathway to a quality job in 10 years.

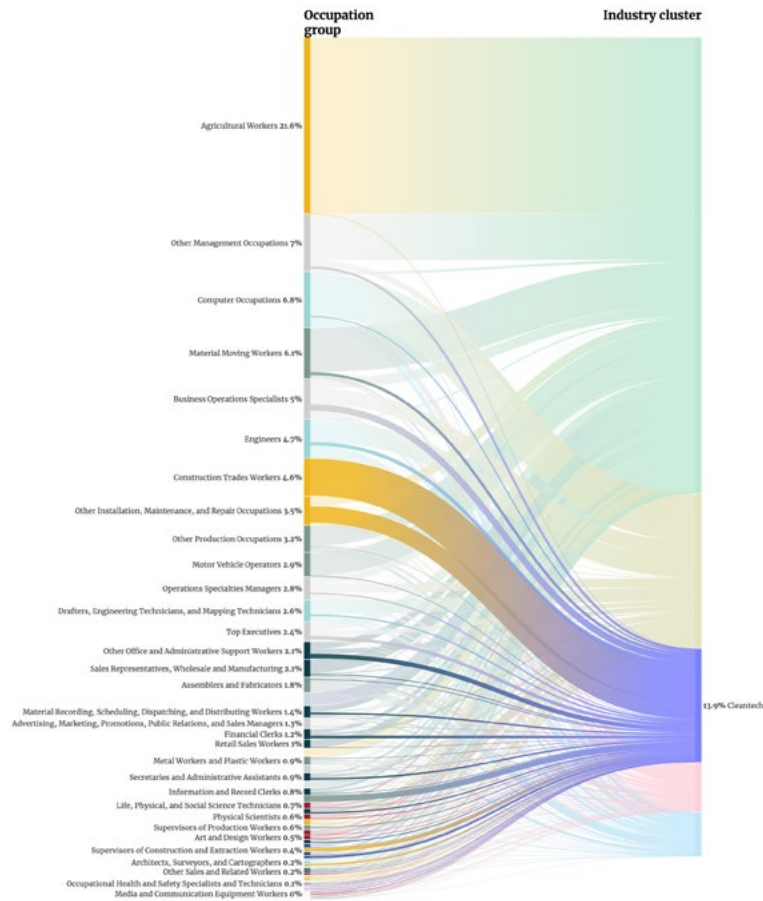
⁷ Innovation ecosystem analysis conducted for Uplift Central Coast, available online [here](#).

⁸ Several of these subindustries are not typical components of a Cleantech / Renewable Energy industry.

CLEAN TECHNOLOGY | TALENT NEEDS AND IMPLICATIONS

Share of priority cluster jobs by occupation and cluster in the REACH region

Occupation Group: ■ Computer, Engineering, and Science ■ Education, Legal, Community Service, Arts, and Media ■ Healthcare Practitioners and Technicians ■ Management, Business, and Finance ■ Natural Resources, Construction, and Maintenance ■ Production, Transportation, and Material Moving ■ Sales and Office ■ Service



Source: Brookings analysis of American Community Survey Public-Use Microdata Sample and Lightcast estimates.

OF THE REGION'S cleantech workers, the largest occupations are construction trades (2,535 positions), other installation, maintenance, and repair occupations (1,129 positions), and business operation specialists (454 positions). The top human capital characteristics required for quality jobs in the industry are installation, repairs, equipment maintenance, building and construction, and equipment selection. Employer input echoes these findings, revealing unmet demand for workers in the trades (as is the case throughout the United States). Stakeholders also expressed a specific need to improve existing trades workers' access to the training and certifications required for installing electric vehicle charging infrastructure and converting existing buildings from natural gas to cleaner electric energy sources. In addition to these shorter-term talent needs, action will also be needed over the longer term to cultivate the skilled workforce needed for offshore wind, re-purposing of the Diablo Canyon site as a cleantech innovation park, and other large-scale cleantech endeavors.

CROSS-INDUSTRY TALENT FINDINGS

FOUR OCCUPATIONAL CATEGORIES are most relevant to the Central Coast's priority industries. Analysis of the total number of jobs by occupation across all five of the Central Coast's priority industries reveals four types of occupations that are particularly significant to companies' operations within each of these industries in terms of both the number of positions and their importance to the industries:

- 01 Engineering and engineering technician occupations**
(4,070 or 7.2% of jobs in priority industries): These types of positions are more than three times more concentrated in priority industries than the broader Central Coast economy. Although engineering jobs are mostly thought of as highly skilled, nearly 40% of the workers in these positions do not possess a four-year degree, which means many are accessible to mid-skilled workers. Mid-skilled workers in these positions appear to be especially important to priority industries.
- 02 Computer and mathematics occupations**
(3,920 or 7% of jobs in priority industries): These types of positions are around three times more concentrated in priority industries than the broader Central Coast's economy. While computer scientists and mathematicians do need advanced degrees, some 30% of these types of positions in the Central Coast's priority industries are held by workers who do not possess a four-year degree. Mid-skilled workers in these positions appear to be especially important to priority industries.
- 03 Production, metalworking, and assembly occupations**
(3,780 or 6.7% of jobs in priority industries): This category includes assemblers and fabricators, metals and plastics workers, plant and production system operators, and other non-supervisory specialized production workers. These types of positions are between 1.4 to 3.6 times more concentrated in the priority industries versus the rest of the Central Coast's economy, depending on the category. Nearly 80% of these types of jobs are held by workers who do not possess a four-year degree, although only 16% are held by workers who have no post-secondary education or training.
- 04 Installation, maintenance, and repair occupations**
(5,010 or 8.9% of jobs in priority industries): This includes construction trades (2,640 jobs), installation and maintenance occupations (1,970 jobs), vehicle mechanics (326 jobs), and electrical workers (75 jobs). Most of these types of positions are between 1.5 to 2.7 times more concentrated in the priority industries versus the broader economy, though some are less concentrated in these industries. About 95% of these types of jobs are held by workers who do not possess a four-year degree, although only 15% are held by workers who have no post-secondary education or training.

Other occupational categories that are numerous in each of the Central Coast's priority industries are transportation and material moving occupations (1,700 jobs in all priority industries combined), supervisors of production and material moving occupations (1,230 jobs), and business operations occupations (10,840 jobs). However, despite how numerous these positions are within priority industries, they generally do not account for a larger portion of these industries' jobs than they do in the rest of the economy, so appear, on average, to be less particular or specialized to priority industries.

The shared demand for workers with skills suited to these types of occupations among priority industries offers a direction for near-term talent development strategies and may point to opportunities for cross-industry workforce development that serves more than one priority industry. Though all of these occupational categories are more or less represented in one of the priority industries compared to others, they nonetheless suggest the types of knowledge, skills, and training that could serve a critical mass of employers across priority industries, particularly for mid-skilled positions that tend to draw from the local labor market.

Quality jobs in the region's priority industries share technical skill and knowledge requirements, providing a foundation for multi-industry talent pipeline activities.

The top five skills that appear to be especially important to quality jobs in the region's priority industries (compared to the economy as a whole) each relate to technical analysis and problem-solving:

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- + INSTALLATION:** The learned skill of installing equipment, machines, wiring, or programming to meet specifications is 2.7 times as important to the average job in priority industries as it is to jobs in the rest of the Central Coast's economy.

 - + PROGRAMMING:** The learned skill of writing computer programs for various purposes is 2.4 times as important to the average job in priority industries as it is to jobs in the rest of the Central Coast's economy.

 - + TECHNOLOGY DESIGN:** The learned skill of generating or adapting equipment and technology to serve user needs is 2.1 times as important to the average job in priority industries as it is to jobs in the rest of the Central Coast's economy.

 - + ENGINEERING AND TECHNOLOGY:** The knowledge of the practical application of engineering and technology principles, techniques, procedures, and equipment to the design and production of goods is 1.9 times as important to the average job in priority industries as it is to jobs in the rest of the Central Coast's economy.

 - + TROUBLESHOOTING:** The learned skill of determining causes of operating errors and deciding what to do about it is 1.7 times as important to the average job in priority industries as it is to jobs in the rest of the Central Coast's economy.

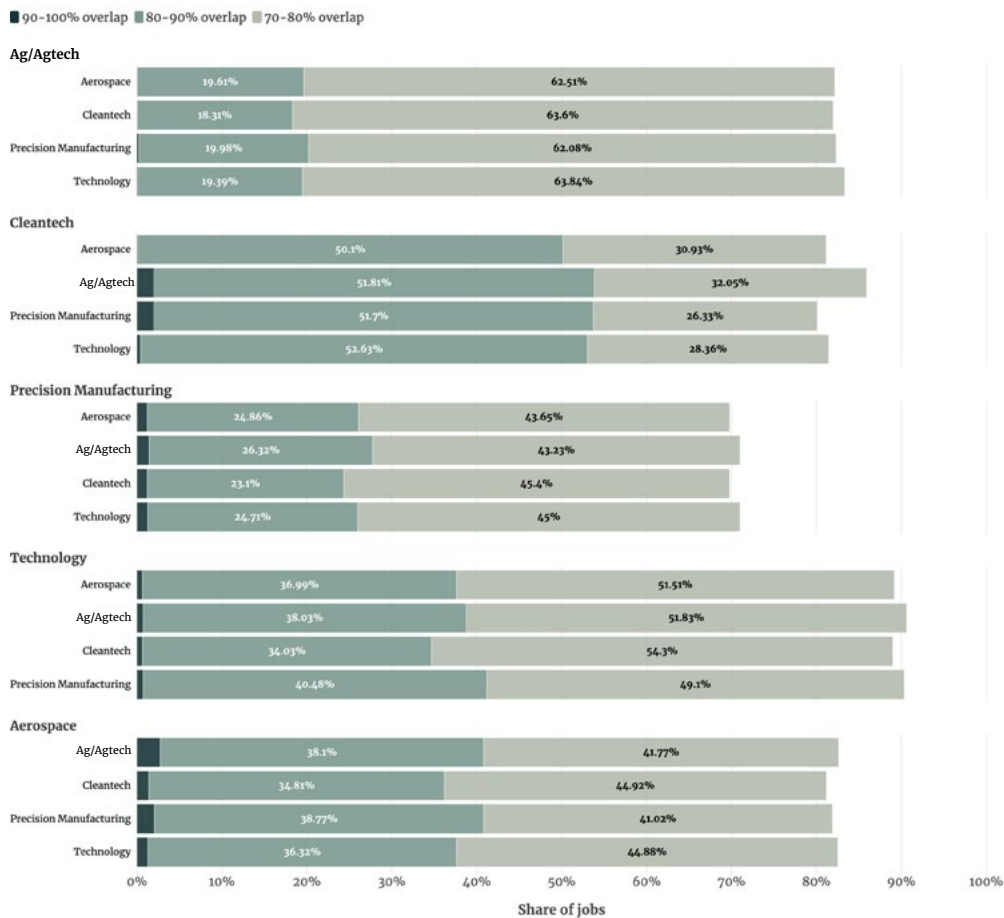
OTHER ESPECIALLY IMPORTANT skills in priority industries include operations analysis, systems analysis, systems evaluation, quality control analysis, and science (using scientific rules and methods to solve problems). Most of these skills and knowledge are especially important to the jobs of mid-skilled and high-skilled workers alike.

While the specific skills and knowledge required will vary by occupation and industry, these general commonalities provide a starting point for aligning the regional education and training ecosystem with the talent needs of employers in the five priority industries: Workers in these highly competitive 21st-century priority industries that depend on innovation and precision need not only the technical skills to work with modern equipment and processes, they also need to know how to solve problems through systematic evaluation and scientific reasoning.

However, each priority industry has specific and differentiated talent demands that will require dedicated training programs. Although priority industries do share common occupational and human capital requirements, especially in their most important positions, each industry has specific talent demands. Despite the general overlaps noted above, the average worker in a given priority industry has only 74–78% of the human capital that is most important to jobs in other priority industries.⁹ Furthermore, less than 2% of workers in a given priority industry have more than 90% of the human capital required in the average job in one of the other priority industries. This may suggest that, notwithstanding some commonalities, many hard-to-fill positions in priority industries could warrant dedicated training or recruitment programs.

⁹These figures come from an analysis of a U.S. Department of Labor data product called O*Net. O*Net describes various characteristics of the average job in each occupation, including typical work contexts, educational requirements, and human capital. The human capital characteristics are broken out into 125 facets that are grouped into three “domains”: Knowledge, Skills, and Abilities. The facets describe quite detailed human capital traits that are relevant to the work performed in jobs. They include traits such as night vision (an ability), writing (a skill), and mathematics (an area of knowledge). For each occupation, O*Net reports two measures: the average worker in an occupation’s level of sophistication in that facet and the average importance of that facet to the occupation. These two measures allow us to compare how much of the human capital required in one occupation could be met by an average worker employed in another occupation. For example, a statistician has 100% of the level of mathematics knowledge required to be an electrician but only 20% of the level of knowledge of engineering. Because knowledge of engineering is more important to an electrician’s work, the overall extent of the statistician’s human capital overlap with the electrician is low, suggesting the statistician would need extensive training to compete for a job as an electrician.

Share of jobs in source cluster that meet a portion of the human capital requirements in the target cluster



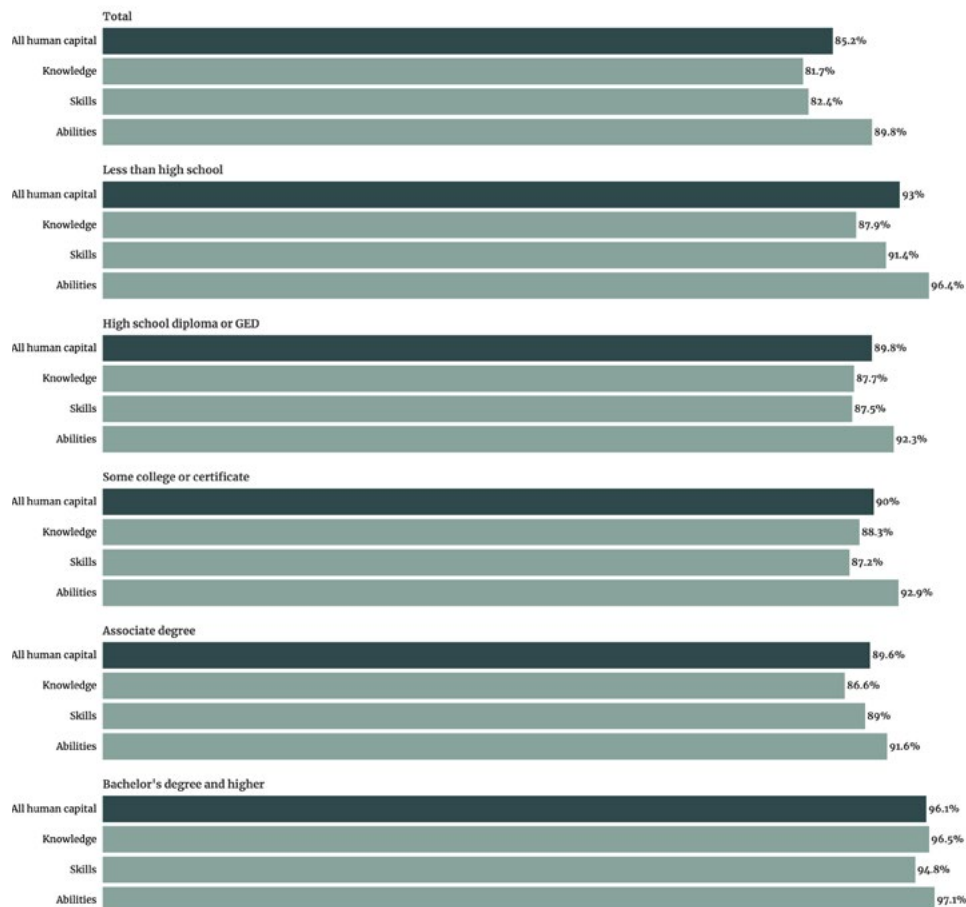
Source: Brookings analysis of O*Net data, Lightcast estimates, and American Community Survey data.

ECONOMIC AND WORKFORCE developers should still seek synergies among these industries where possible. Though not many workers have all or nearly all of the human capital they need to satisfy the needs of the average position in other priority industries, many workers do have most of the human capital they would need. For example, 25–50% of the workers in the aerospace, cleantech, precision manufacturing, and technology industries have at least 80% of the human capital they need for the average position in the other industries. These are industries that may benefit significantly from some shared training programs in in-demand occupations, with limited additional coursework or on-the-job training to close knowledge or skill gaps specific to the work environs of each industry.

The Central Coast's struggling workers have much of the human capital required in priority industries.

ON AVERAGE, THE human capital profile of jobs in the region's priority industries resembles the human capital of the region's quality jobs. Many of the same human capital facets are disproportionately important to both types of jobs: Science, operations analysis, programming, technology design, systems evaluation, and systems analysis. Struggling workers have, on average, at least 85% of the human capital required for these types of jobs. This suggests it should be feasible to close specific knowledge or skill gaps with targeted training programs. Indeed, these findings may suggest that the real challenge for the region is not upskilling, but rather increasing the number of quality jobs so that struggling workers have more opportunities to acquire them. That makes sustaining and growing these opportunity-rich priority industries all the more imperative for the Central Coast.

Average human capital overlap between struggling workers and opportunity jobs



Source: Brookings and Cities GPS analysis of O*NET data, American Community Survey public-use microdata sample 1-year estimates, and Lightcast estimates.

Improved employer access to appropriately skilled workers and well-supported career pathways for struggling workers will be needed to address expected talent shortfalls and increase the number of households that are financially self-sufficient.

SECTOR NEXUS FOR REFINED FOCUS: PRECISION MANUFACTURING AND AUTONOMOUS SYSTEMS

Supplemental analysis of local supply chain relationships among the prioritized industries revealed that components of the region's existing technology, aerospace, and precision manufacturing industries are better understood as a cross-cutting precision manufacturing and autonomous systems cluster. This redefined grouping encompasses the design and manufacture of complex electronic and communication systems, instruments, and software, which together fuel innovations ranging from satellites to voice recognition systems. It is broader than the industry subsector activities previously assigned as just precision manufacturing, combining elements of technology and aerospace. Employer input confirmed the commonalities in functions and processes across these three verticals. As one business leader put it, **“what we're making is less important than how we're making it.”**

Thus, precision manufacturing in the Central Coast region covers a wide range of activities, including design and production of unmanned aerial systems, electric motors and power electrics for semiconductor production, industrial automation, radar platform components, defense applications, and power generation systems. In total, this cluster accounts for about 10,000 jobs in the region and generates about \$2.5 billion in gross regional product.

Shared occupational needs for the precision manufacturing and autonomous systems cluster include engineers, technicians, and computer programmers, reflecting the broader talent requirements shared across the region's priority industries. Organizing employers and education and training providers across this redefined cluster achieves scale in establishing stronger talent pipelines that serve multiple subsectors where the region has a competitive advantage and concentration of quality jobs.



TALENT DEVELOPMENT SYSTEM

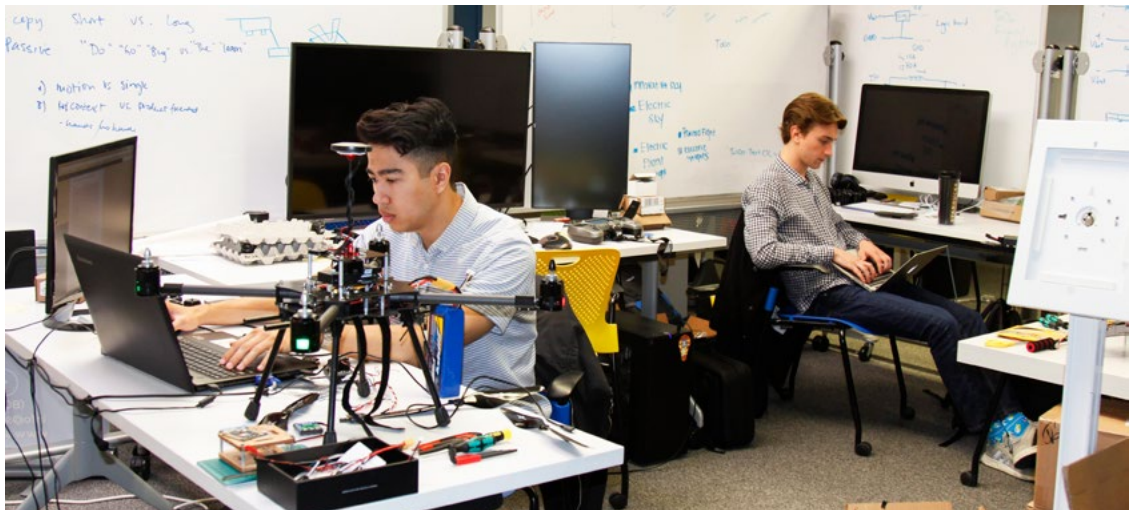
ANALYSIS + KEY INSIGHTS

IN THEORY, DEVELOPING a talent pipeline for industries should be straightforward. The availability of well-paying jobs that often involve meaningful, interesting work should result in a steady supply of workers interested in filling those positions. Higher education and workforce providers should respond to employer demand, aligning programs and dividing up responsibilities in order to accelerate worker preparation. Elementary and secondary school teachers and mentors should make students aware of these opportunities and inspire them to pursue careers as machinists, programmers, technicians, and operations specialists.

The reality is much more complex. Individual workers opt for jobs that are familiar to them. The interests of employers and workers do not always coincide. Employer talent demand signals are often nebulous, making it difficult to determine priorities for action. Talent development systems tend to be fragmented by limited information, individual and institutional incentives, bureaucratic requirements, and coordination gaps. Education and workforce providers must balance a broad range of competing factors, including faculty interests, access to funding, and policy constraints.

In this complex ecosystem, economic development intermediaries can play a crucial role easing two of the fundamental problems of the modern knowledge economy: 1) ensuring employers can find appropriately skilled workers, given that access to talent is vital to business success and 2) ensuring residents can achieve greater economic mobility despite economic shifts that have narrowed pathways into the middle class.

This section aims to evaluate the current state of industry and workforce alignment on the Central Coast, setting the stage for developing future strategies.



ANALYSIS OF TALENT SYSTEMS ALIGNMENT WITH PRIORITY INDUSTRY NEEDS

Talent development for prioritized sectors in the Central Coast is primarily anchored by a variety of two- and four-year postsecondary institutions located throughout the region. County workforce development boards, K-12 education systems, short-term training providers, labor apprenticeships and training, and wraparound support service providers round out this ecosystem, playing an important role in expanding access to career pathways and connecting workers to jobs.

POST-SECONDARY EDUCATION INSTITUTIONS IN THE CENTRAL COAST REGION

COUNTY	INSTITUTIONS
SAN LUIS OBISPO COUNTY	<ul style="list-style-type: none"> • California Polytechnic State University—San Luis Obispo (Cal Poly) • Central California School of Continuing Education • Cuesta College • Designs School of Cosmetology • Laurus College • San Joaquin Valley College—Atascadero
SANTA BARBARA COUNTY	<ul style="list-style-type: none"> • Antioch University—Santa Barbara • Allan Hancock College • A.T. Still University—College for Healthy Communities • Center for Employment Training (CET)—Santa Maria • International Sports Sciences Association • Fielding Graduate University • San Joaquin Valley College—Santa Maria • Santa Barbara Business College—Santa Maria • Santa Barbara City College • University of California, Santa Barbara • Westmont College

METHODOLOGY FOR TALENT ALIGNMENT ANALYSIS

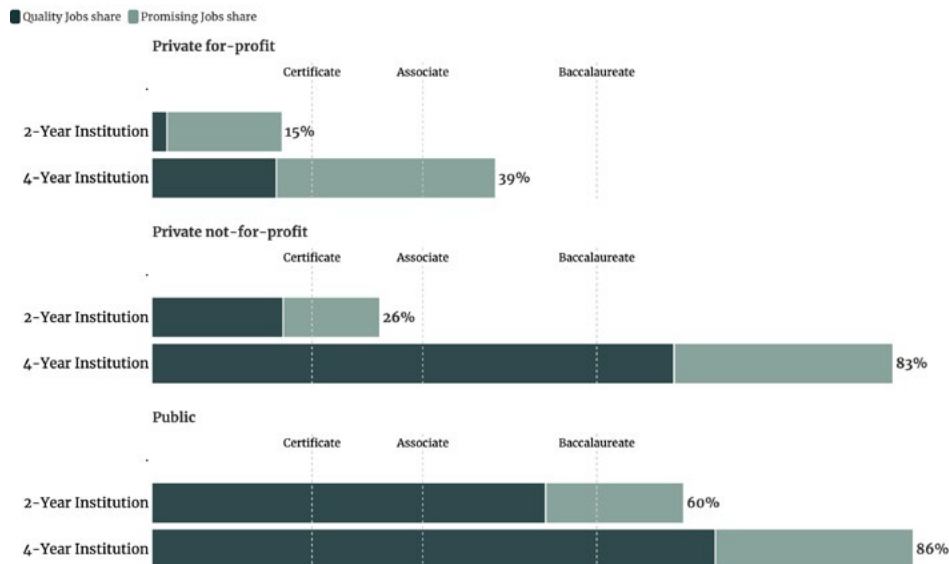


This examination of “talent alignment” between the output of local institutions and the regional supply of quality and promising jobs is based on analysis of data compiled by the National Center for Educational Statistics (NCES) on program completions among colleges and universities.

NCES provides lists of occupations suitable to graduates of each program of study. Additional customized analysis was completed matching these results to the occupational composition of Central Coast jobs to determine region-specific proportions of graduates across programs. This enabled application of Opportunity Industries data on quality, promising, and other jobs to the analysis, showing the distribution of job quality among graduates both in the aggregate and in specific program areas.

Notably, this analysis cannot evaluate program or instructional quality nor does it represent actual job outcomes of graduates; rather, it provides an estimate of the average quality of jobs available to graduates of each program

Estimated share of graduates by institution type for whom an opportunity job is available in the regional economy for REACH region educational institutions from 2018 — 2022



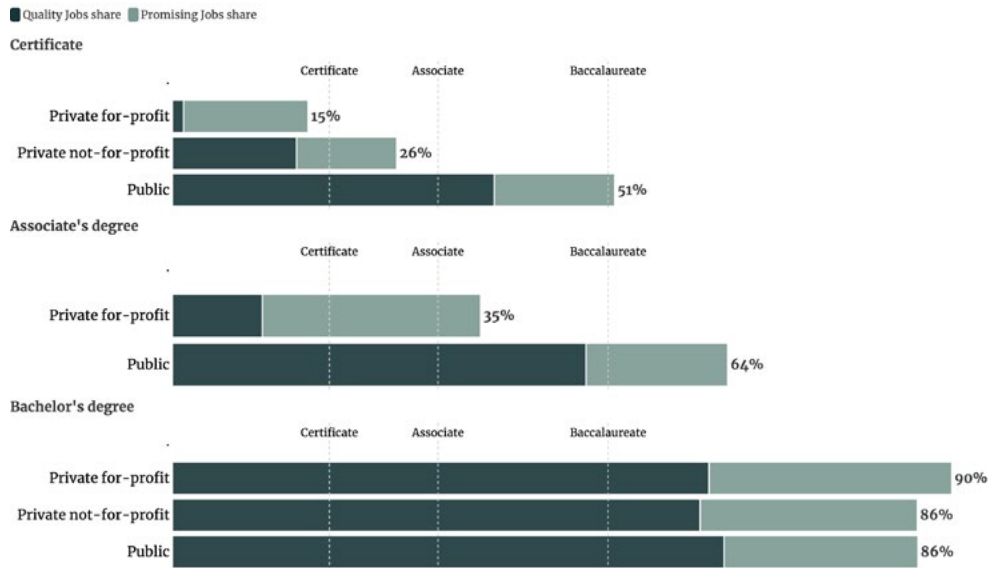
Source: Brookings and Cities GPS analysis of National Center for Education Statistics data and ACS microdata.

Types of educational institutions—and individual colleges or universities—vary in the production of students with qualifications that align with the supply of quality and promising jobs available within the regional economy. These outcomes are influenced by industry presence and characteristics vis a vis institutional offerings and individual student choices; they do not reflect the relative quality of an educational program.

IN THE AGGREGATE, public institutions are more likely to prepare students for these jobs at both the two and four-year degree level. These rates, however, vary by type of credential, priority industry, and the four major occupational groups.¹⁰ For instance, a certificate from a public institution is more likely to prepare a Central Coast worker for a quality job in precision manufacturing than an associate's degree from a public institution. Meanwhile, in computer and mathematics occupations, an associate's degree from a public institution is nearly as likely to prepare a worker for a quality job as a bachelor's degree from a public institution.

¹⁰ These groups are: engineering and engineering technician occupations, computer and mathematics occupations, production, metalworking, and assembly occupations, and installation, maintenance, and repair occupations.

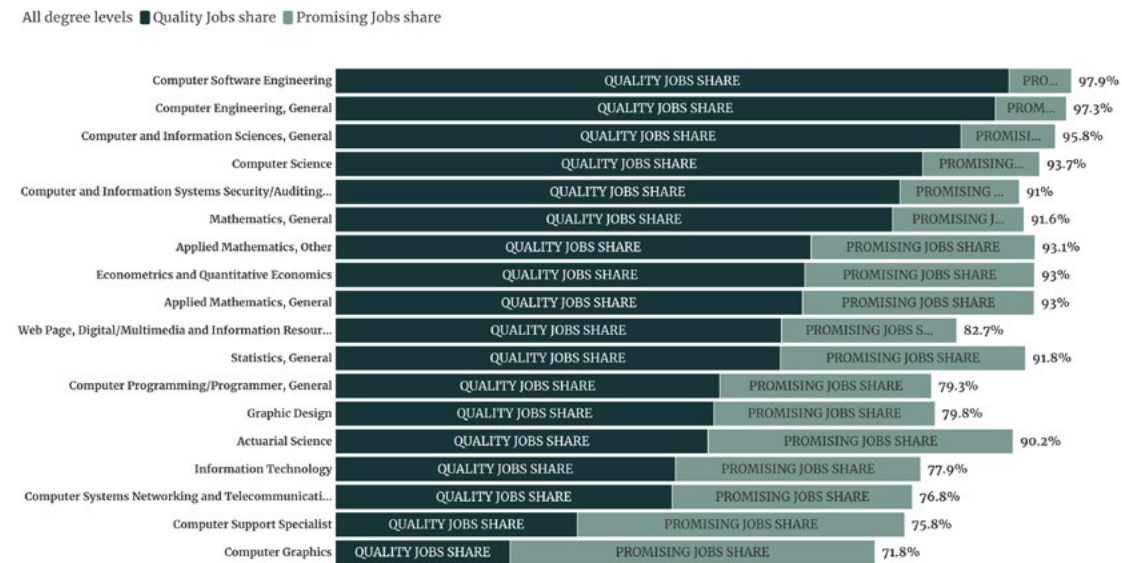
Estimated share of graduates who have a quality or promising job by institution type and degree level from REACH region institutions from 2018 — 2022



Source: Brookings and Cities GPS analysis of National Center for Education Statistics data and ACS microdata.

SPECIFIC DEGREES WITHIN the region also provide variable positioning for quality and promising jobs in the four priority occupational areas. For instance, across all degree levels, computer software engineering shows the highest promise (97.9%) in preparing students for such jobs within computer and mathematics occupations. However a computer graphics program only shows an estimated share of 71.8% of graduates positioned for quality and promising jobs, weighted toward promising roles.

Estimated share of graduates for whom a quality or promising *computer and mathematics* job is available in the regional economy, by program and degree level for REACH region institutions from 2018 — 2022



Source: Brookings and Cities GPS analysis of National Center for Education Statistics data and ACS microdata.

IN ALL, THESE findings lead to important implications for how the region's higher education system prepares students for quality jobs in priority industries:

- The region's public, private, four-year, and two-year institutions play important roles in talent development for priority industries.
- Securing quality positions within priority industries and common occupational fields does not always align straightforwardly with the hierarchy of educational attainment. For example, in certain scenarios, short-term certificates may offer a more direct pathway to quality jobs than associate's degrees. This indicates the nuanced and variable nature of matching the supply of skilled talent with market demand.
- Two- and four-year institutions play very different roles in talent development for priority industries. Four-year programs produce many more graduates regionally than two-year programs for key jobs. This is especially true for engineering and engineering technician occupations, computer and mathematics occupations, and logistics and operations workers. Two-year programs are primarily responsible for graduates entering production, metalworking, and assembly occupations and electrical equipment mechanics and installers.
- Technical certificates offered by public institutions in the region position many workers for jobs in priority industries.
- Many institutions in the region play roles in providing workforce for priority industries. While UC Santa Barbara and Cal Poly provide the greatest scale, the region's community colleges produce thousands of graduates equipped for jobs in these industries, particularly in key occupations.

KEY INSIGHTS FROM EMPLOYER AND TALENT SYSTEM ENGAGEMENT

The regional talent development system struggles to balance priority industries—and “next” opportunities—vis-à-vis industries with more predictable demand.

Employers and regional leaders credited several institutions for value to priority industries. For example, Cal Poly is widely seen as a reliable source for entry-level engineering and technology talent. UC Santa Barbara and Santa Barbara City College are working with Santa Barbara companies to build a more consistent cleanroom workforce pipeline through the Central Coast Partnership for Regional Industry-focused Micro/Nanotechnology Education. The Santa Barbara South Coast Chamber of Commerce, Santa Barbara-based education and workforce providers, and several regional companies are now aiming to expand similar pipelines via an Advanced Manufacturing Upskilling Network. Allan Hancock College has built out strengths in STEM and manufacturing. Cuesta College is delivering a tailored aircraft maintenance technician program seeded by ACI Jet and San Luis Obispo County. SLO Partners focuses on serving the technology, aerospace, and precision manufacturing industries through training and apprenticeship programs and receives high marks for its nimble, flexible approach.

However, institutions, particularly at the sub-baccalaureate level, often face a web of competing demands and incentives that impact their ability to respond nimbly to needs and prioritize “next” opportunities. Industries with more predictable larger-scale hiring (e.g., healthcare) tend to get the most attention even when wages and / or benefits lag. Small and mid-sized employers hire many workers in the region but have a hard time attracting the attention of education and training providers due to their size. Faculty interests and capabilities determine course offerings. Academic processes and requirements slow new program development. Policy choices can promote a narrow focus on specific populations that limits organizational capacity to assist other workers.

These circumstances point to the need for countervailing incentives to move new strategies from episodic to mainstream. Achieving this aim chiefly requires clear, consistent industry input and influence supporting organizational accountability for delivery in priority areas.

At the program level, many providers are delivering specific interventions that reflect promising practices, suggesting a readiness to innovate.

Consultation with individual institutions revealed a variety of thoughtful initiatives. For example, both the San Luis Obispo and Santa Barbara County Workforce Development

Boards expressed commitment to supporting industries and placements that offer workers access to economic mobility as opposed to “just any job.” The San Luis Coastal Education Foundation’s iINNOVATE initiative is an ambitious effort to boost long-term pipelines and career awareness in alignment with the REACH 2030 plan. The Santa Barbara County Office of Education facilitates industry “Teacher Tours” and summer teacher externships. Cal Poly, already seen as a leader in industry responsiveness, is initiating a “Corporate Engagement Collaborative” model that brings together various university divisions in order to create a more seamless, bundled experience. UC Santa Barbara is deepening its focus on professional and continuing education post-COVID. Allan Hancock College, Cuesta College, and Santa Barbara City College are also undertaking thoughtful strategies, as referenced elsewhere in this section. While these practices typically are not scaled or connected, they indicate a basis for working with institutions to adopt and expand effective approaches.

Connections are growing among several workforce and education providers, but not yet at sufficient scale, consistency, or impact of coordination.

Highlighting the lack of a common table to sync their efforts, providers describe numerous partnerships with select other education and workforce organizations with few examples of system-wide convergence. The Santa Barbara and San Luis Obispo County Workforce Development Boards have developed a partnership with regular dialogue, collaborating on administrative and program delivery areas such as service provider identification and cross-promotion of trainings, and now are seeking greater alignment on data collection and industry priorities. Santa Barbara stakeholders report regular coordination meetings among community colleges, school districts, and county education staff. Allan Hancock College has a STEM program relationship with Cal Poly and also shares industry advisory councils with high schools to promote alignment and reduce burden on employers. Workforce and education leaders in the region often serve on chamber and business leadership boards.

However, these connections remain limited and largely episodic. One institution described having working relationships with two other entities in its county but not with another high-relevance organization nearby and no connections beyond the county border. These examples are emblematic of how most collaborations are occurring in the region. While the links that do exist are promising, they are not sufficient. For systemic impact, engagement must move beyond information-sharing to include alignment of strategies, programs, and investment.

Taken together, these insights suggest the need for a dedicated, neutral convener that can take responsibility for facilitating collaboration among the various actors via project management, research, and pursuit of joint funding opportunities.

Both employers and education and training providers report that the status quo is not working, indicating an opportunity for action.

Employers perceive the region's workforce training ecosystem as offering mixed results in identifying and meeting talent needs, particularly in priority industries. At the same time, workforce providers report difficulty engaging the fragmented employer community and gathering accurate information on their skills needs, which at least partially explains why current occupational demands are not well reflected in regional workforce ecosystem strategies. Providers also report that employers lack full awareness of available programming and underutilize career and technical education and contract training offerings. This mutual dissatisfaction offers an opening for new approaches.

The region's industrial structure presents challenges for aggregated employer demand, raising the imperative of a coordinating intermediary.

The region is largely composed of small and mid-sized companies that are distributed across dispersed economic nodes rather than large centralized anchor employers. This reality poses barriers to identifying common occupational needs, organizing collective action, and achieving scale for workforce program delivery that goes well beyond the handful of workers that a small company may hire in a given year. These dynamics elevate the importance of an intermediary that can aggregate employer demand within and / or across industries at a scale large enough for the workforce system to respond. It also underscores that smaller and mid-sized companies need technical assistance to compensate for their limited capacity for skills mapping, regularized training, extensive recruitment, and other human resource functions.

Significant support services are required to broaden the region's talent pipelines and increase residents' economic mobility.

Providers emphasized the significant barriers that first-generation students and others from non-traditional backgrounds face in completing their courses of study. From navigating academic and career options and balancing education and work-based learning with other work and family responsibilities to physically getting to campus and dealing with unexpected fees and expenses, these challenges are often too large for these students to surmount on their own. The complexity and demands of STEM programs, which are core to many of the region's priority industries, pose particular hurdles. Providers described innovative responses, such as translating textbooks and modifying curriculum to be more culturally responsive. Strategies, however, will need to reach greater scale to fully address the need.

RECOMMENDATIONS FOR ACTION



The Central Coast faces a set of high-level challenges when it comes to strategy development for addressing regional talent needs.

The Central Coast region must manage the central conundrum of economic and workforce development alignment: how to balance “now” versus “next” priorities.

While talent availability is a prime factor in driving business location and expansion decisions, regional education and training providers may be reluctant to build tailored talent pipelines without significant industry presence. In this region, strategies to accelerate development of agriculture technology and build a robust cleantech industry are still nascent, with further development required to establish true industry clusters. As such, regional efforts in agtech and cleantech should focus initially on spurring industry growth, with complementary talent strategies staged and sequenced over time. The other three priority industries— aerospace, precision manufacturing, and technology—already have a sizable presence in the region and would benefit most from efforts to improve and expand talent development strategies.

The prevalence of small and mid-sized companies with few large anchor employers requires aggregating talent demands in order to achieve sufficient scale.

The size of employers in the Central Coast region has important implications for strategic focus. With relatively few very large companies to anchor demand across a sector, small and mid-size employers tend to have less consistent talent needs (i.e., hiring just a few workers each year) and less internal capacity for human resources and talent development activities. As a result, talent providers find it difficult to develop responsive training programs that lead to consistent job placements. These dynamics necessitate a focus on adding up employer talent needs in shared categories such as skilled technicians in order to reach the scale needed to ensure that new strategies and programs have a far-reaching effect.

Strategies must account for the large geography of the region.

The Central Coast region encompasses two Metropolitan Statistical Areas: the Santa Maria-Santa Barbara MSA and the San Luis Obispo-Paso Robles-Arroyo Grande MSA. While significant industry and workforce assets are shared across these geographies, quantitative analysis and stakeholder insights suggest that

in some circumstances, industry strengths, talent needs, supply chains, and other economic fundamentals are better defined at smaller-scale geographies or cross-jurisdictional areas (e.g., Santa Maria – San Luis Obispo). While all regional talent strategies require setting common priorities, aligning capacities, and scaling best practices, some tactics may be best addressed at the subregional level. At the same time, the region must be intentional in ensuring that subregional approaches add up to common regional objectives and do not produce fragmentation.

Costs of living pose a serious barrier to talent access—and by extension the region's economic future.

A persistent lack of affordable housing, high childcare costs and limited accessibility, and other issues related to the cost of living are exerting significant pressure on the region's talent supply. These concerns present sizable obstacles to talent attraction and retention and have led some employers to move jobs outside the region. While regional influence over the many macro forces involved is limited, potential responses such as public-private partnerships to expand childcare availability and workforce housing development will be vital if the region hopes to address these foundational economic challenges.

ENGAGEMENT WITH COMPANIES in priority industries and workforce and education providers surfaced a variety of interventions that could be adapted or scaled in the region to improve the talent pipeline and residents' access to quality jobs. These interventions are organized under the following proposed action plans to guide regional efforts:

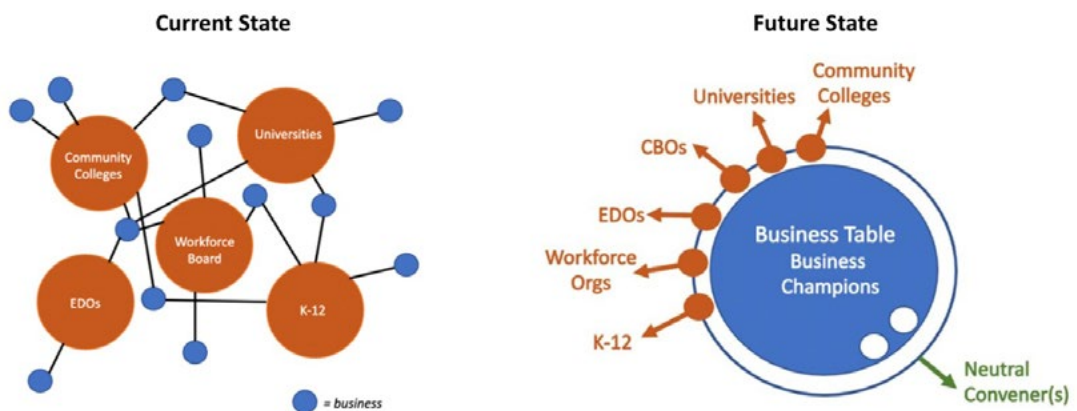
- + Enhancing industry + workforce alignment and collaboration
- + Addressing mid, high, and non-skill talent needs

A key place to start, as outlined below, is a regional initiative focused on precision manufacturing and autonomous systems, which can serve as a pilot for regional collaboration and support the talent needs for multiple priority industries including aerospace, precision manufacturing, and technology.

+ ACTION PLAN FOR INDUSTRY + WORKFORCE ALIGNMENT AND COLLABORATION

INDUSTRY AND TALENT system findings indicate the compelling need for a business-driven coordinating intermediary in the Central Coast region to address collective action problems across talent development. Such an intervention reflects emerging best practices across the country. Over the last decade, regions seeking to integrate economic and workforce efforts have cultivated more proactive industry leadership in talent development—often under the banner of “talent-industry exchanges” or “industry-workforce partnerships.” These are distinguished from traditional workforce system-led efforts that are distributed across many institutional tables, focused more on supply side than demand, and oriented to employer inputs that meet provider requirements rather than providers in service of employers. This approach has been promoted by a range of groups representing business to worker to community interests, such as programs of the U.S. Chamber of Commerce Foundation and the Institute for Networked Communities.

At a high level, talent-industry exchanges organize companies within a given industry (or occasionally industries with very strong talent adjacencies) and providers around one business-led table to identify and act on shared talent priorities. This reduces fragmented interactions among individual companies and institutions, creating clearer order and focus behind identifying and addressing industry needs (see below).



Note: “Future State” graphic (at right) is sourced from the Institute for Networked Communities’ Next Generation Sector Partnerships Initiative.

As a result, providers can better identify and meet employer needs at scale, receiving and sharing more timely and accurate insights and forecasts to inform activities across occupations and skill levels, plus coordinate offerings. By acting jointly to proactively guide workforce efforts, companies can get easier access to more useful assistance, rather than individually navigating services or fielding duplicative outreach from providers figuring out how to help. This especially improves support for and worker access to smaller and mid-sized companies with less internal capacity to engage.

The operational structure and design of such an initiative varies across regions, depending on local capacity and culture. In most regions, one organization is not equipped to fully deliver a comprehensive initiative, meaning some distributed implementation is required for action. However, it is also often difficult to maintain momentum in a dispersed system where multiple contributors dilute direction, ownership, and accountability for fulfilling commitments.

Gaps revealed through engagement with priority industry companies and workforce and education providers, along with transfer of experience from other regions, uncovered four functions that a talent-industry exchange should fill, with attendant activities.

**+ COORDINATION OF
EMPLOYER DEMAND
SIGNALS**

- Build employer collaboratives sequentially, focused on industries concentrating quality jobs and having a critical mass of common skill and occupational demands, working with “business champions.” – local companies willing to dedicate time, know-how, and leadership to these efforts.
 - Secure employer-specific occupational data (entering into Non-Disclosure Agreements, if necessary) to narrow talent priorities and aggregate shared needs to scale sufficient for intervention.
 - Engage employer collaborative(s) to validate findings and establish “minimum viable product” for talent output ahead of firm-specific in-house training.
 - Establish a regular cadence for revisiting analysis and priorities.
 - Build consensus among employers on identified needs and requests of providers.
 - Design and manage systems to hold employers accountable for assigned activities and ensure progress on mid-term and long-term goals.
-

+ COORDINATION OF EDUCATION AND WORKFORCE DEVELOPMENT PROVIDERS

- Facilitate a two-county network of education and workforce leaders to improve baseline coordination and respond to employer collaborative needs.
 - Work with providers to adopt shared data sources, align advisory councils, adjust metrics to reflect shared, strategic priorities, and take other steps to streamline systems.
 - Serve as a clearinghouse for consideration of joint education and workforce opportunities (e.g. grants).
 - Identify and promote adoption of innovative practices and programs.
- Reach agreement among providers on workplan and division of roles for meeting employer needs (e.g. jointly developing or sharing curriculum, splitting specializations in areas that are resource intensive).
- Design and manage systems to hold providers accountable for assigned activities and ensure progress on mid-term and long-term goals.
- Broker solutions to political and institutional disputes between talent stakeholders.

+ BUILDING THE TALENT PIPELINE

- Serve as a hub or concierge for employer and provider problem-solving in developing responses (e.g. securing equipment or instructors for new programs) or otherwise navigating the talent system (e.g. connecting employers to provider X to address a specific issue).
- Work with employers to adopt best practices for talent recruitment and retention, such as work-based learning, skills-based hiring, and strengthening of internal human resources capabilities, either through promotion of such practices or hands-on technical assistance.¹⁰
- Incubate specific programmatic initiatives such as high-skill talent recruitment, support for partner placement, etc.

+ THOUGHT-LEADERSHIP AND POLICY

- Act as a vocal and visible champion for the urgency of addressing talent gaps and the connection to the region's future, creating pressure for action.
- Celebrate employer and provider success stories, validating promising approaches.
- Advance related policy action (e.g. workforce housing).

¹⁰ Cleveland's SkillUp initiative provides a novel model for improving internal business human resources capacities. See David Feinerman, "Many businesses have irrational human resources practices. How Cuyahoga County, Ohio is working to address that," Brookings, December 2019, <https://www.brookings.edu/articles/cuyahoga-county-ohios-experiment-in-helping-businesses-invest-in-talent/>.

COMPANIES AS PARTNERS IN TALENT DEVELOPMENT



Active business leadership in talent development is a core driver of success, albeit one less common in the U.S. than nations such as Germany. Engagement with Santa Barbara and San Luis Obispo County stakeholders revealed a number of promising examples, exemplified by ACI Jet's partnership with Cuesta College to develop an aviation maintenance technician program that is now poised to serve a broader range of companies. Others include a companywide succession planning process at Entegris to identify and invest in individuals with promotion potential, Amazon's Junior Developer partnerships with Cal Poly and UC Santa Barbara, which engage students in work-based learning experiences that lead to a job post-graduation, and the efforts of Atomica and other Santa Barbara semiconductor companies in shaping training programs.

Closing the region's talent gaps will require this type of employer leadership. Companies need to position themselves as core, consistent partners in talent development. As a baseline, this will require clearly communicating talent needs, helping shape programming, facilitating work-based learning experiences, and ultimately employing trained workers. One provider suggested that front-end employer commitments to hire participants in specific programs could improve the scale and stability of training efforts.

Employers are also uniquely positioned to help overcome workforce and education system barriers, such as securing access to equipment, finding appropriately skilled instructors, and raising or providing funding for specialized training facilities.

Lastly, companies should be encouraged to adopt internal best practices such as investing in incumbent workers to encourage retention, taking steps to foster a more inclusive work environment, and considering a shift from degree requirements to skills-based hiring policies in order to expand the pool of potential workers.

+ ACTION PLAN TO ADDRESS MID, HIGH AND NON- SKILL TALENT NEEDS

ENGAGEMENT WITH COMPANIES in priority industries and workforce and education providers raised a range of interventions that could be either adopted or scaled in the region generally to improve the talent pipeline and broaden access to quality jobs. These tactics should be vetted through newly-organized talent-to-industry exchanges to determine prioritization.

MID-SKILL

THE REGION SHOULD take the following steps to improve the mid-skill talent pipeline and expand access to quality jobs:

- + **Expand work-based learning (apprenticeships, internships, earn-and-learn) in priority industries, leveraging public subsidies and supportive services.**
 - Establish industry-specific internship program(s), organized by a coordinating intermediary, to lower transaction costs and create opportunities at small and mid-sized companies that lack the capacity to offer their own programs.
 - Explore potential to scale or adopt lessons learned from industry-driven training pilots underway in the two-county region and the Central Coast more broadly, with a focus on preparing lower-wage workers for mid-skill job opportunities. These pilot efforts include ACI Jet's partnership with Cuesta College to build a stronger aircraft maintenance technician pipeline, the Monterey-based DART-Joby Advanced Manufacturing Apprenticeship Program (AMAP) pilot seeded by the Irvine Foundation, the Central Coast Partnership for Regional Industry-focused Micro/Nanotechnology Education based in Santa Barbara, SLO Partners, and the planned Santa Barbara-based Advanced Manufacturing Upskilling Network.
 - Identify skills and credentials short of a four-year degree that prepare workers for priority industry occupations (e.g. tech, as indicated by employer interviews). Partner with bootcamps and short-term training providers and provide work-based learning opportunities and job placement for entry-level workers who complete these programs.

MID-SKILL (CONT.)

- + **Partner with community-based organizations to expand pipelines for work-based learning opportunities (and ultimately quality, mid-skill jobs).**
 - Increase awareness of and connect individuals to training pathways in priority industries, with emphasis on mid-skill workers who do not hold a bachelor's degree.
 - Provide wraparound support services to lower barriers to completion of training programs and increase worker readiness for employment opportunities.
 - Leverage the networks of community-based organizations in order to reach potential workers from historically underrepresented and / or disinvested communities.

- + **Adopt workplace best practices that broaden talent pipelines, encourage worker retention, and support workers' economic mobility.**
 - Implement skills-based hiring that prioritizes credentials and competencies rather than degree requirements in order to expand the potential talent pool and codify this informal practice.
 - Establish internal promotion policies and pathways as well as employer-provided training to enable career advancement and boost employer access to appropriately skilled talent.
 - Foster inclusive workplaces that support worker success in order to boost worker engagement and retention.

- + **Improve employer awareness of and access to short-term incumbent worker training by community colleges and outside accredited programs. This type of training lets employers promote from within when filling higher-skill roles and helps workers advance in their careers.**

- + **Expand pipeline-building efforts such as industry-specific STEM career awareness in the K-12 system in order to secure long-term results.**
 - Scale practices such as teacher tours and externships, field trips, and career days to spur student interest in STEM fields and priority industries.
 - Target first-generation students and individuals from other historically underrepresented groups, who often lack the resources and social networks needed to provide sufficient guidance, career information, and support as they select and pursue a career pathway.

What this means for priority industries

Analysis of talent demands in priority industries offers a foundation for steering tactics to specific occupational areas, to be validated by employer collaboratives. Across aerospace, precision manufacturing, and technology, these include assemblers and fabricators, engineering technicians, computer occupations, and business operations specialists. Efforts may be targeted, in particular, to known gaps, such as the mid-skill technician shortage highlighted by employer interviews.

The region can also take steps to advance longer-term efforts to build cleantech and agtech specializations, in tandem with economic development initiatives such as the redevelopment of Diablo Canyon into a cleantech innovation park. This includes increasing the number of workers in the trades through more inclusive career awareness outreach, well-supported pathways, and more inclusive workplaces. It could also mean improving trades worker access to the training and certifications needed for jobs related to climate adaptation.

To build a more tech-ready agriculture workforce, the region can collaborate on programs that help agricultural production workers acquire the STEM skills required for 21st-century farm operations. The region might also work with tech-enabled industries to expand and improve pipelines and career pathways into engineering and software occupations.

HIGH-SKILL

THE REGION SHOULD take the following steps to improve the high-skill talent pipeline:

- + Initiate joint external recruitment by a trusted intermediary to fill common occupational gaps on behalf of small and mid-sized companies.
- + Invest in cultivating increasingly robust industry ecosystems (particularly in tech) that offer workers long-term opportunities to build their careers.
- + Establish programming for young professionals that publicizes regional quality-of-life assets and builds community in order to promote longer-term retention of recent university graduates and mid-career workers in the Central Coast.
- + Consider opportunities for sharing difficult-to-find, specialized workers among several companies via employer collaboratives (provided that employers are able to surmount competitive company dynamics).

What this means for priority industries

Analysis of talent demands in priority industries also offers a foundation for steering tactics to boost high-skill talent availability, to be validated by employer collaboratives. Engineers, computer occupations, and business operations specialists are among the occupations identified as in highest demand. Employer interviews, in particular, emphasized gaps in mid-career and senior engineers, especially specialized roles.

NON-SKILL

Significant non-skill barriers to job creation and access overarch the actions recommended above. While not treated in depth here, addressing these barriers is critical to the region's success in reaching its goals.

- + **Focus business efforts on addressing the region's overall housing challenge by investing and advocating for more workforce housing in the region via employer-supported developments and other models.**
- + **Work to resolve the region's lack of childcare options via employer-led efforts and advocacy.**
- + **Support partner placement to bolster efforts to attract mid- and high-skill job candidates to the region.**

NEW APPROACHES ON PARTNER PLACEMENT

Several employers noted that attracting strong job candidates to the Central Coast can be difficult if they are partnered because the spouse or partner of the relocating worker would have a hard time finding work in the region. One potential solution involves having the hiring employer provide career coaching and job search assistance to the partner of the new hire. However, this approach—though effective—is best suited to large employers and can be difficult for a small or mid-sized company to manage. Given that many small and mid-sized employers in the region face this problem, aggregating the demand for such services and offering career coaching and employment services through an intermediary would help adapt this best practice for the Central Coast.

Economic development organizations facing similar situations in other parts of the country have developed similar approaches. REDI—Eastern Idaho developed a “Trailing Spouse Program” and Hello West Michigan asks partners of new hires to upload their resumes to the organization's job bank and then follows up. In the Central Coast region, these services could be offered by an in-house staff person or a contracted service. Although a number of temp agencies and HR consulting firms offer services for relocating partners, it is critical to ensure that the selected service provider has more than a superficial connection to the local labor market.

+ A PLACE TO START: REGIONAL PILOT INITIATIVE FOCUSED ON PRECISION MANUFACTURING AND AUTONOMOUS SYSTEMS

SIMULTANEOUSLY ADVANCING NEW comprehensive talent initiatives across five industries represents a heavy lift for the Central Coast. Further, several industries require additional economic development investment prior to focusing on talent development. A sequenced approach enables the region to take a more measured approach, ramping up capacity and delivering early wins to show proof-of-concept.

Leaning into the cross-cutting precision manufacturing and autonomous systems specialization identified through supplemental industry clusters analysis offers such an opportunity. As described earlier in this report, this specialization bridges dimensions of the region's currently-defined precision manufacturing cluster with aspects of aerospace and technology. Focusing here enables the region to both build a critical mass of employers to guide targeted action and develop solutions that will also be relevant across the broader set of related industries.

Efforts to organize this industry should follow the action plan outlined above, including:

- Assemble an employer collaborative of representative firms to validate and prioritize among specific occupational needs.
- Collectively engage workforce and education leads to build pipeline strategies.
- Deploy specific programs and tactics to meet identified needs, drawing from those in this section or others identified in organizing.
- Develop a plan to advance related policy action (e.g. workforce housing).
- Continually monitor and evaluate progress for ongoing course correction.



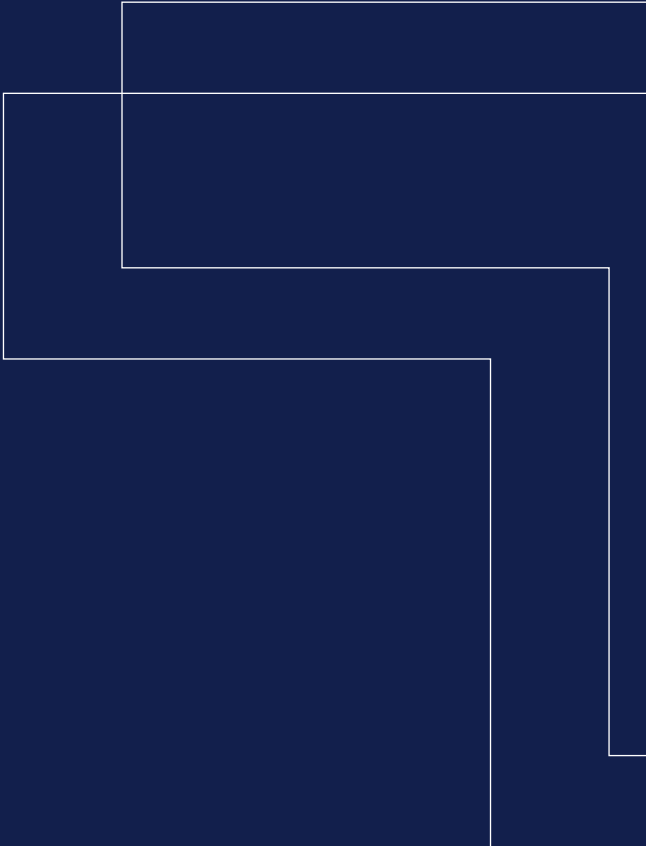
CONCLUSION

ALTHOUGH WELL-KNOWN for viticulture, tourism, and hospitality, Santa Barbara and San Luis Obispo Counties share a broader set of economic strengths that range from agriculture to specialized semiconductor production and satellite technology that address some of the nation's most critical competitive and national security challenges. These industry specializations require world-class talent—from skilled senior engineers to design technologists to “touch labor” technicians who assemble highly precise outputs.

Making the most of the region's knowledge-fueled priority industries requires ready access to the skilled talent that companies need to thrive. But the talent challenges facing the Central Coast are far too large for any one business or organization to address on its own. As such, regional collaboration on employer-led talent development must become a core component of economic development in the region. Working together, companies can identify common goals and talent needs, leverage economies of scale, and improve coordination within the talent development ecosystem. They can strengthen and expand talent pipelines, reduce barriers to opportunity, and establish well-supported pathways into jobs that pay well. By cultivating a more collaborative and more responsive talent development ecosystem, regional business and economic development leaders can help workers achieve their potential and sharpen the regional economy's competitive edge.



APPENDIX



METRICS

PERFORMANCE MEASURES ARE important for ensuring the delivery and accountability of any initiative. This is particularly true for large-scale collaborative efforts distributing responsibility across different systems, organizations, and leaders, often with varied institutional interests, incentives, and funding streams.

The metrics appropriate for responding to the findings and recommendations of this report will ultimately be dependent on local decisions and organizing that reach consensus among employers, providers, and intermediaries. Decisions will include the industry or industries of immediate focus, priority occupations, and the scale of efforts.

Metrics typically follow a “logic model” or “theory of change” connecting activities (or inputs) to specific, measurable near-term outputs and then to bigger-picture ambitious outcomes and impact that galvanize and inspire action. These metrics may relate to both operational and programmatic objectives.

Pending local decisionmaking, examples may include:

SAMPLE INPUTS	SAMPLE OUTPUTS	SAMPLE OUTCOMES
Organizing of regional provider collaborative	Attendance at collaborative meetings, sharing of data, signing of MOUs or other agreements for joint efforts	X percentage of employers report improvements to coordinated service delivery
New or expanded programs (consisting of X slots) serving priority occupations	Production of X number of graduates available to perform a given role or occupation	Employers in X industry are able to grow in the region due to a more stable talent pipeline; residents have access to more quality jobs
Creation of program for supporting spouses and partners of new regional workers	Numbers of events and other services delivered, numbers of participants	X number of spouses and partners find appropriate jobs in the region, X number of new workers are retained in the region over 5 years

METHODOLOGY

THIS REPORT LEVERAGES quantitative and qualitative analysis conducted between May and December 2023 to provide actionable insights to bolster talent pipelines and improve access to opportunity jobs in the Central Coast. This analysis followed the five priority industry categories identified in the region's 2023 Resilience Roadmap plan.

Research was also undertaken in parallel with extensive economic, labor market, industry cluster, public health, and environment analysis conducted for Uplift Central Coast, a six-county regional economic development collaborative convened by REACH, the Economic Development Collaborative, and the Monterey Bay Economic Partnership under the State of California's California Jobs First initiative. Uplift research activities provided supplementary information to deepen the interpretations in this report, in some cases.

QUANTITATIVE RESEARCH

Quantitative analysis centered around a suite of analyses building from the Brookings Institution's Opportunity Industries methodology for assessing the concentration of quality and promising jobs in regional industries (see definitions and additional explanation in "An Overview of the Central Coast Economy.") Such analyses employ datasets spanning public and proprietary sources including the U.S. Census Bureau, the University of Washington's Self-Sufficiency Standard, and Lightcast.

Once assessment of the concentration of quality and promising jobs in the five priority industries and component subindustries was complete, additional analysis was undertaken to understand talent needs and inform appropriate workforce and education responses.

This included:

- **Talent demand analysis** mapping the most prominent occupations in each of the priority industries, utilizing data from Lightcast and the American Community Survey.
- **Talent adjacency analysis** employing data from *ONET to assess the similarity of pairs of the region's industries and industry clusters based on the types and levels of talent required in the jobs of each industry or cluster. The similarity or "adjacency" of knowledge, skills, and abilities of a pair of industries indicates how easily workers in one industry may be able to fulfill job requirements in another. This can be useful if one of the industries is a strong economic development target, revealing how well

- existing workers are suited to potential job openings. The findings also suggest pairs of industries may benefit from similar workforce strategies. In this case, analysis is applied to determine how well-positioned workers are to fill positions in opportunity industries. Adjacency is stronger if in the mid-90th percentile, and weaker in the 80th percentile or below.
- **Talent alignment analysis** exploring the connection between the output of local institutions and the regional supply of quality and promising jobs is based on analysis of data compiled by the National Center for Educational Statistics (NCES) on program completions among colleges and universities. NCES provides lists of occupations suitable to graduates of each program of study. Additional customized analysis was completed matching these results to the occupational composition of Central Coast jobs to determine region-specific proportions of graduates across programs. This enabled application of Opportunity Industries data on quality, promising, and other jobs to the analysis, showing the distribution of job quality among graduates both in the aggregate and in specific program areas.

Note: This analysis does not evaluate program or instructional quality nor does it represent actual job outcomes of individuals. Rather, it provides an estimate of the extent to which opportunity jobs are available to graduates of each program in the regional economy.

Quantitative talent research was also informed by broader **analysis of the region and priority industries' economic performance**. This information lent important context on growth trends impacting ongoing talent demand and offered insights on how best to organize companies for talent responses. Methods employed included shift-share decomposition analysis, which disaggregates the role of national and state performance in driving regional results (and pinpoints the “local share” of growth). Such analysis helps identify areas that are particular regional strengths, and which are buoyed by broader trends. Proprietary databases such as Pitchbook and Dun & Bradstreet were also consulted to explore deeper industry dynamics.

Lastly, **supplemental industry clusters analysis** was applied to further understand linkages between industries and assess areas of comparative advantage. This research applied machine learning methods to large datasets that describe intra-regional supply chains and talent demand, revealing groups of industries that belong to the same regional value chain and groups of industries that have common talent needs, which are highly correlated with each other. This analysis led to the identification of the region's cross-cutting precision manufacturing and autonomous systems specialization.

QUALITATIVE RESEARCH

In-depth interviews with priority industry firms, along with education and workforce providers, were undertaken to validate insights from quantitative research, understand the existing talent development ecosystem, and inform recommendations. Interviewees included:

COMPANIES AND INDUSTRY GROUPS

- ACI Jet
- AcreCloud
- Amazon (in Santa Barbara and San Luis Obispo)
- Andros Engineering
- Atomica
- Bardex
- Central Coast Community Energy
- CIO Solutions
- Electric Power Research Institute
- Entegris
- Google Quantum
- Hearst
- Hortau
- Inspired Flight
- Mantis Composites
- Pearce Services
- Quintron
- Revasum
- SoCal Gas
- Stellar Exploration
- Tractor Cloud
- TRIC Robotics

- Trust Automation
- Umbra
- Vistra
- Western Growers Association

EDUCATION, WORKFORCE, AND OTHER INTERMEDIARIES

- Allan Hancock College
- Cal Poly Career Services
- Cal Poly Center for Innovation and Entrepreneurship
- Cal Poly Strawberry Center
- Cuesta College
- Santa Barbara City College School of Extended Learning
- Santa Barbara County Office of Education
- Santa Barbara County Workforce Development Board
- San Luis Coastal Education Foundation
- San Luis Obispo County Office of Education / SLO Partners
- San Luis Obispo County Workforce Development Board
- UCSB Professional and Continuing Education

Insights from additional Santa Barbara and San Luis Obispo-based interviews conducted for Uplift Central Coast, such as with the Santa Barbara South Coast Chamber of Commerce, Santa Maria Valley Chamber, and City of Paso Robles, also informed this report.

Lastly, input was also solicited and themes were tested with stakeholder groups including the REACH Council and individual Industry Councils convened through the Resilience Roadmap planning process.

REACH