

APPENDIX J

Workforce Analysis

SOAR Bakersfield Workforce Analysis

for the
City of Bakersfield

Prepared for:
City of Bakersfield
1600 Truxtun Avenue
Bakersfield, CA 93301

October 2025

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Prepared For:

City of Bakersfield
1600 Truxtun Avenue
Bakersfield, California 93301
Contact: 661.326.3733

Prepared By:

Ascent Environmental dba Ascent
2550 Fifth Avenue, Suite 640
San Diego, CA 92103
Contact: 619.219.8000

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1 WORKFORCE ANALYSIS SUMMARY

Sustainable Opportunities Advancing Resilience (SOAR) Bakersfield is an initiative to enhance sustainability and resilience to the impacts of climate change in the City of Bakersfield. SOAR Bakersfield addresses climate and air pollution through a set of measures across various sectors, including transportation, waste, water supply, energy, and natural and working lands. The measures include defined priority initiatives, or “primary measures,” that were identified through engagement with local government and the community at large. These primary measures are a subset of a larger suite of policies, programs, and projects that the City intends to pursue as funding becomes available. Through these measures, the City of Bakersfield intends to leverage the ongoing transition of California to a low-carbon and resilient economy. This transition will require a skilled workforce across various growing occupations to implement.

The SOAR Bakersfield Workforce Analysis builds upon the existing training programs and research publications of several educational institutions, non-governmental organizations, labor unions, and government agencies to identify strategies the City of Bakersfield (hereinafter referred to as City) can implement to support the development of a local workforce for future projects and industry opportunities. This analysis reviews economic and workforce trends and projections for occupations relevant to the implementation of SOAR Bakersfield, estimates jobs that will be required for relevant occupations, and identifies challenges and opportunities for expanding the local workforce. A component of the analysis is identifying strategies that build upon existing efforts to support residents of Bakersfield and Kern County (referring to the geography of Kern County in this report) in securing jobs in growing sectors that provide employees with a family-supporting wage, opportunities for advancement and skill development, and an inclusive work environment. These types of jobs are referred to as “high-quality” or “high-road” jobs. This analysis and the identified strategies are intended to be focused on areas addressed within the SOAR Bakersfield measures and goals, and are not comprehensive across all industry sectors and occupations in Kern County and the Central Valley.

Kern County’s economy is largely driven by trade and transportation, agriculture, fossil fuel and renewable energy power production, and health services. As of 2023, 68 percent of jobs in Kern County are in occupations with a mean wage below what is considered a living wage for two working parents and two children, \$25.07 per hour. Between 2022 and 2032, without considering implementation of SOAR Bakersfield, there is expected to be a large number of job openings in occupations that pay a living wage. Electricians, plumbers, pipefitters and steamfitters, and heating, ventilation, and air conditioning (HVAC) mechanics and installers are all expected to experience over 800 job openings each between 2022 and 2032 (3,020 combined), and all pay over \$30.00 per hour on average. There is also expected to be a large projected increase in job openings for occupations that on average pay near or below the living wage standard, including landscaping and groundskeeping workers, construction laborers, and general maintenance and repair workers.

Implementation of SOAR Bakersfield and other regional projects in the Central Valley, such as high-speed rail and renewable energy installations, will result in increased demand for many high-paying occupations that are already expected to have high demand under a business-as-usual scenario. Increased installations of heat pumps could substantially increase employment demand for HVAC technicians, electricians, and plumbers. The construction and operation of the California High-Speed Rail will continue to require general and specialized construction labor, as well as specialized jobs for maintenance and operations. At least four maintenance and operation facilities are planned for the Central Valley, and although the locations are not finalized, some may be located in Kern County. The rise of carbon capture and sequestration also presents an opportunity for transitioning oil and gas workers; however, the rollout of carbon capture projects has been slow.

Many education, training, and certification programs exist in Kern County and Bakersfield, with opportunities for apprenticeships and on-the-job training offered through the community colleges, high schools, and economic development institutions. These programs have been effective in supporting the development of skills and requirements for a local workforce in growing sectors, such as electric vehicles and renewable energy. There are also many programs that address the socioeconomic barriers that residents of Kern County face in preparing for and accessing high-quality jobs, including education, language, childcare, transportation access, and formerly

incarcerated status. However, there is a clear need to increase accessibility to these programs and education and training opportunities to enable broader participation across demographic groups. Given an expected increase in certain occupations, such as engineers, electricians, EV installers/maintenance/charging infrastructure, and solar photovoltaic installers, there may be a need to expand the capacity of existing programs at local colleges and trade schools.

Six strategies have been identified, with support from Kern Community College District (Kern CCD) and engagement with stakeholders, for the City of Bakersfield to consider in supporting workforce development. These include:

- ▶ Update the City's Procurement and Hiring Policies to Prioritize the Local Workforce
- ▶ Expand Education and Certification Opportunities for Occupations with Growing Demand
- ▶ Partner with Community-Based Organizations to Improve Accessibility to High-Road Jobs
- ▶ Create Additional On-the-Job Training and Apprenticeship Opportunities
- ▶ Address Housing Affordability by Implementing the Housing Element
- ▶ Support Retraining for Carbon Capture and Storage and Renewable Energy Projects

Metrics associated with these strategies are identified to allow the City to measure the success of workforce development strategy implementation. The SOAR Bakersfield Workforce Analysis is intended as an initial assessment to assist the City in its efforts to implement SOAR Bakersfield and provide long-term benefits to residents. As the City implements SOAR Bakersfield and regional economic shifts continue, updates to the Workforce Analysis and strategies may be needed.

2 INTRODUCTION

2.1 SOAR BAKERSFIELD OVERVIEW

SOAR Bakersfield is intended to improve sustainability and resilience in Bakersfield through implementation of a suite of measures compiled from local and regional planning documents and studies, existing and planned City department initiatives, input from community members and stakeholders, and best practices identified from actions implemented in other cities and regions across California. The proposed measures of SOAR Bakersfield cover a variety of topics ranging across energy, transportation, waste management, water supply, and nature-based solutions. These measures will be implemented as funding and resources become available. An overall goal of SOAR Bakersfield is to initiate a transition to a low carbon and resilient economy. SOAR Bakersfield represents one important initiative in the City's overall strategy to realize this transition. The City will continue to implement and monitor progress on SOAR Bakersfield and develop additional policies, programs, and projects that support a larger scale transition reflective of community needs and local economic conditions.

2.2 EPA WORKFORCE ANALYSIS REQUIREMENTS

SOAR Bakersfield serves as the Comprehensive Climate Action Plan (CCAP) under the U.S. EPA Climate Pollution Reduction Grants Program. As part of the grant, SOAR Bakersfield must include a workforce planning analysis to identify potential workforce shortages or challenges associated with the implementation of SOAR Bakersfield measures, and potential solutions that address the cause of these shortages and challenges. The analysis will also inform future investments in workforce development intended to create quality jobs and eliminate barriers to employment. A variety of occupations are included in this analysis due to the different types of actions contemplated under SOAR Bakersfield, ranging from the construction of energy efficient buildings to installation of smart water meters.

3 BACKGROUND INFORMATION

The following section provides an overview of existing economic conditions and demographics in Bakersfield and Kern county. It also includes an overview of existing workforce-related initiatives and partnerships from various institutions and organizations across the region.

3.1 KEY INDUSTRIES

As of 2022, Kern County’s economy was valued at a gross-domestic product (GDP) of \$43.8 billion, ranking 14th in California (Kern County 2024: 5). Private service industries made up 44% of the GDP, which includes sectors such as trade, transportation, utilities; education and health services; and leisure and hospitality. Government contributed 29% of GPD, and private goods industries were 29%, which includes sectors such as agriculture and manufacturing (Kern County 2024: 61). Kern County has had a higher historic job growth rate compared to the national average of approximately 14%, experiencing a 23% increase in jobs between 2009 and 2019 (B3K Prosperity: 22). In 2019, 42% of these jobs were concentrated in local-serving sectors, which provide goods and services for consumers and businesses within Kern County (B3K Prosperity 2021: 26). The other 58% of job growth occurred in the tradeable sectors that export goods and services, and public sectors, which includes civilian and military employment.

In 2023, the largest job sector was government, with an estimated 21% of Kern County’s workforce employed at a government (Kern County 2024: 60). The next largest sector is likely agriculture, with total jobs estimated between 53,000 and 65,000 (Kern County 2024: 60, B3K Prosperity 2021: 28). Variation in agricultural workforce numbers is due to the migrant status of those employed, with considerations including employment at multiple companies, cross-county commuting, and unreported employees. The distribution of jobs according to industry sector is illustrated in Table 1.

Table 1 Number of Jobs Per Industry Sector (2023)

Sector	Number of Jobs	Share
Government	73,300	21.1%
Trade, Transportation, Utilities	59,900	17.3%
Agriculture*	53,100	15.4%
Private Education and Health Services	48,600	14.1%
Leisure and Hospitality	29,200	8.5%
Professional and Business Services	27,400	7.9%
Construction	15,600	4.5%
Manufacturing	12,400	3.6%
Other Services	9,000	2.6%
Mining and Logging	7,600	2.2%
Financial Activities	7,600	2.2%
Information	1,700	0.5%
Total	345,000	100%

Notes: * = Agriculture is likely the second largest sector based on surveys conducted by other sources.

Source: Kern County 2024: 60–61.

Jobs in locally serving sectors like health services provide essential services to Kern county community members, however they can include jobs that are considered to be low-quality due to inadequate compensation and unpredictable hours (B3K Prosperity 2021: 26). For example, there has been an increase of 7,000 jobs in the health services sector between 2009 and 2019 (B3K Prosperity 2021: 25), however approximately two thirds of the health

services sector consisted of low- to mid-skill jobs in 2019 (B3K Prosperity 2021: 57). Healthcare support workers earn a mean hourly wage of \$17.63, as opposed to high-skill healthcare practitioners and technicians who earn an hourly wage of \$53.65 (Kern County 2024: 64). Job creation in low-paying industries has contributed to the county's workforce growth but further emphasizes the need for quality job opportunities. As displayed in Table 2, all top five occupations in Kern county (those with the highest number of employees), on average do not meet the county's living wage for two working parents and two children of \$25.07 per hour (Kern County 2024: 64), and more than half of Kern county residents did not earn enough to meet basic needs in 2018 (B3K Prosperity 2021: 46).

Table 2 Mean Wage and Number of Jobs by Occupation (2023)

Occupation	Number of Jobs	Mean Hourly Wage
Farming, Fishing, and Forestry	41,440	\$16.73
Farmworkers and Laborers	39,130	\$16.44
Transportation and Material Moving	35,090	\$21.69
Office and Administrative Support	29,110	\$23.19
Food Preparation and Serving	26,200	\$17.06
Sales	22,570	\$22.48
Educational Instruction and Library	22,530	\$34.50
Healthcare Support	17,800	\$17.63
Healthcare Practitioners and Technicians	15,400	\$53.65
Construction and Extraction	15,000	\$31.72
Management	14,580	\$59.57
Business and Finance	13,360	\$41.09
Installation, Maintenance, Repair	12,380	\$30.33
Home Health and Personal Care Aides	11,390	\$15.52
Production	10,730	\$24.20

Source: Kern County 2024: 64.

Industries that have historically contributed to Kern County's economy include agriculture and oil and gas. As of 2023, agriculture is estimated to contribute \$6.3 billion to the economy (Kern County 2024: 147). The oil and gas industry contributes an estimated \$6.8 billion to \$8.8 billion a year (Kern Council of Governments 2019: 6). Jobs in the oil and gas industry are high quality and relatively accessible, however employment in this industry is highly dependent on global oil prices and the availability of local oil production.

Kern County is also a statewide leader in low-carbon energy development and carbon management (Kern County 2024: 154). Carbon management includes methods to capture or reduce carbon, such as installing carbon capture technologies and transitioning to renewable energy. Wind and solar are readily available sources of renewable energy in the county, with renewable electricity generation contributing to 10% of the county's GDP (Kern County 2024: 154). This makes Kern County the largest producer of renewable energy power in the state. The county is well equipped for carbon management due to its geography and existing oil and gas workforce that have transferable skills. In addition to environmental benefits, low-carbon energy development and carbon management are economic assets. Tax revenues are an important source of income in the county; wind energy alone contributes more tax revenue than oil in the county. Carbon capture projects are anticipated to be a significant contributor to future economic income. The Carbon Management Business Park is a proposal by Kern County Planning and Natural Resources Department that supports development of large industrial parks where one or several carbon management industries are located alongside other industries that support carbon management, including renewable energy and hydrogen production (Kern County 2023). The Carbon Management Business Park concept is estimated to generate tax revenues around \$68 million a year and create 23,000 jobs (Kern County 2024: 164).

3.1.1 Demographics

Accessibility to job opportunities and upward mobility in a career can be assessed by socioeconomic factors like age, ethnicity, income level, education level, and primary language. A job may require employees to possess an academic credential, or a certain number of years in the field to demonstrate mastery of skills. Often jobs prefer employees with English-speaking capabilities, which may create a competitive disadvantage for individuals with a different primary language. Certain industries may also prefer a younger or older workforce depending on the perceived skills and abilities associated with one's age. Socioeconomic factors may reveal disparities in particular industries, such as a concentration of Black, Indigenous, and People of Color (BIPOC) in low-paying jobs. The term BIPOC is intended to acknowledge people of color impacted by racial injustice, including discrimination in the workforce. The demographics of Kern County are important considerations for workforce development, as the City identifies strategies to overcome barriers to high-road job employment. An overview of existing demographics is provided in Table 3.

Table 3 Overview of Kern County Demographics

Demographic Category	Overview
Age	The approaching retirement of the current workforce has facilitated the extension of labor to immigrant workers (Kern County 2024: 45). However with 30% of the population being under the age of 18, there will be an increase in young workers (Kern County 2024: 177).
Education	At the county level, 53% of the population has obtained a high school diploma or GED, 11% have graduated with a bachelor's degree, and 6% have a graduate or professional degree (City of Bakersfield 2021: 5-3).
Language	The second most common language spoken in Kern County in addition to English is Spanish, with 29.3% of Spanish speakers reporting that they have difficulty speaking English (City of Bakersfield 2021: 5-3), and 46% of residents reporting a language other than English is spoken at home (Kern County 2024: 97). Consequentially, language may represent a factor in workforce entry.
Income	The majority of Kern County's workforce is employed in jobs that pay below a livable wage. The median household income is \$48,021 compared to California's median household income \$84,907. Additionally, Kern county's poverty rate of 18.6% is 7.1% higher than the state average (Kern County 2024: 97).
BIPOC	Kern County is home to people of many different ethnicities, with more than half of the population identifying as Hispanic or Latino. The second largest ethnic group are those who identify as White, which is about 29.2% of the population (U.S. Census Bureau 2024). People who identify as White have the highest median earnings in the region, making an average of \$15,000 more than the lowest earning racial groups (people who identify as Black and Hispanic) as of 2018 (B3K Prosperity 2021: 19).

Notes: BIPOC = Black, Indigenous, and People of Color; GED = General Educational Development.

Source: Prepared by Ascent in 2025.

3.2 HIGH-ROAD JOBS

A high-road job provides employees with a family-supporting wage, the opportunity for advancement and skill development, and an inclusive work environment (California Workforce Development Board 2018). These jobs are synonymous with high-quality jobs that provide comprehensive benefits to employees and job security. Opportunities to develop workforce readiness should be available in tandem with the creation of high-road jobs, so residents have the skills necessary to qualify for jobs and successfully perform job requirements.

3.3 REGIONAL NETWORKS AND INITIATIVES

Programs that assist residents in skill development and provide pathways to high-quality employment are important to overcoming the various socioeconomic barriers residents may face. There are organizations within the region that offer workforce training and development programs, with some forming partnerships with local colleges to provide additional educational support. An overview of key programs and organizations dedicated to workforce development in the region are listed in Table 4.

Table 4 Existing Workforce Development Organizations and Programs

Program Name	Organization	Description
Kern Community College District (Kern CCD) - California Renewable Energy Laboratory (CREL)	21st Century Energy Center, Valley Strong Credit Union, California Resources Corporation (CRC) / Carbon TerraVault, NREL, UC Riverside, Project Development Solutions, Lawrence Livermore National Laboratory, Lawrence Berkeley Laboratory, Building Efficiency for a Sustainable Tomorrow (BEST) Center, CSU Bakersfield, UC Merced, CA Community Colleges Chancellor's Office, Kern Superintendent of Schools	Fifty (\$50) million in state funding was allocated to Kern CCD to establish and scale up CREL, a community college initiative aimed at workforce development, industry partnerships, community engagement, and increased educational opportunities in Kern County and statewide. CREL partners with industry, federal and state government agencies, workers in disinvested communities, and high-road training partnerships to expand the clean energy economy in California.
Kern Coalition – California Jobs First (CJF)	Kern CCD, A Better Bakersfield and Boundless Kern (B3K), Kern Inyo Mono Central Labor Council, Community Action Partnership of Kern, Building Healthy Communities Kern	A collaborative of organizations formed to respond to the opportunities outlined by CJF by leveraging the resources of participating organizations to ensure all Kern county stakeholders are represented in decision making around state grant funding opportunities.
High Road Training Partnership (H RTP): California Legacy High Road to Oil Well Capping	Operating Engineers Union Local 12, Laborers LiUNA/Local 220, California Legacy Well Services (LLC and principals), Fresno Regional Workforce Development Board, B3K Prosperity	This strategic partnership aims to bring high-paying, high-quality employment to a region that has become increasingly exposed to economic decline as the state moves away from oil and gas extraction toward more sustainable and environmentally compatible energy sources.
H RTP - High Road to Regional Workforce Strategies: Kern County	Kern CCD, Bakersfield College, Center on Race, Poverty & the Environment, UC Merced Community and Labor Center, Kern, Inyo, and Mono Counties Central Labor Council, Kern, Inyo, Mono Building Trades Council, Committee for a Better Arvin, Committee for a Better Shafter, Comité Progreso de Lamont, Delano Guardians	A coalition of key stakeholders, including those often excluded or under-valued in economic development planning and workforce training opportunities, to develop community-and worker-centered Strategic Workforce Development Plan.
H RTP: Connecting Underrepresented Workers to High Road Jobs Project	Kern CCD, Kern Inyo Mono Central Labor Council, Kern Inyo Mono Building Trades Council, International Brotherhood of Electrical Workers	A project designed to support work-based learning, internships, pre-apprenticeship, and apprenticeship in new and emerging energy industries.

Program Name	Organization	Description
Transformative Climate Communities (TCC) Southeast Strong Project	City of Bakersfield, Housing Authority of Kern (HACK), Community Action Partnership of Kern, Habitat for Humanity – Golden Empire, Circle of Life Development Foundation, GRID Alternatives, Kern CCD, Golden Empire Interventions, County of Kern Employers' Training Resource, Kern County Black Chamber of Commerce, Mission Community Services Corporation, Ventura County Community Development, 3C Capital Funding, Greater Bakersfield Legal Assistance	The Southeast Strong's TCC grant will invest in community-proposed projects in the disadvantaged communities of Southeast Bakersfield, including equitable housing and neighborhood development, mobility and urban greening, and workforce development and economic opportunities.
A Better Bakersfield and Boundless Kern (B3K)	Valley Strong Credit Union, Tejon Ranch Co., Tel-Tec Security Systems, City of Bakersfield, County of Kern, Bolthouse Properties, Cornerstone Engineering, IBEW Local 428, Dignity Health, Kern Health Systems, United Farm Workers and CSUB	To reduce the number of local children in struggling families in half by creating 100,000 more quality jobs in Kern county by 2031 and developing pathways to access them.
Prosperity Neighborhood Project	City of Bakersfield	Investments dedicated to revitalizing East Bakersfield, including investments towards creating economic opportunity to move families out of poverty by creating asset-building strategies and wealth building; and creating partnerships with trade schools, colleges, and universities.
Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES)	University of California Office of the President, Governor's Office of Business and Economic Development, the State Building and Construction Trades Council and Renewables 100 Policy Institute	Investment of \$1.2 billion in federal funding towards 39 hydrogen infrastructure projects, several of which are to be located in Kern county.

Notes: ARCHES = Alliance for Renewable Clean Hydrogen Energy Systems; B3K = A Better Bakersfield and Boundless Kern; CJF = California Jobs First; CSUB = California State University, Bakersfield; HACK = Housing Authority of Kern; HRTF = High Road Training Partnership; IBEW = International Brotherhood of Electrical Workers; NREL = National Renewable Energy Laboratory; TCC = Transformative Climate Communities; UC = University of California.

Source: Kern County 2024: 37–42; adapted by Ascent in 2025.

4 WORKFORCE TRENDS AND PROJECTIONS

4.1 SOAR BAKERSFIELD IMPLEMENTATION AND RELATED OCCUPATIONS

Historic trends and projections of the Kern County workforce relevant to SOAR Bakersfield, including total number of employees and wages, are important indicators of where the City may need to invest in workforce development. Jobs that are critical to a low-carbon economy may require a larger workforce than currently exists, and current jobs in decline may indicate the need for transitional programs. It is important to note that the COVID-19 pandemic resulted in a spike of unemployment in the Bakersfield Metropolitan Statistical Area, rising from the historical average of 7–8% to 19% in April of 2020 (City of Bakersfield 2021: Appendix B 13), however it has since returned to 8% as of July 2025 (U.S. Bureau of Labor Statistics 2025a). An assessment of employment and wage/salary changes between 2019 and 2024 is provided in Table 5. Below are some key takeaways from the trends shown in Table 5:

- ▶ Training and development specialists, computer hardware engineers, and HVAC mechanics and installers had a greater than 50% increase in employment.

- ▶ HVAC mechanics and installers had a 24% increase in average wage, from \$25.85 to \$32.12.
- ▶ Farm equipment mechanics and service technician employment increased by 95%, and drywall and ceiling tile installer employment increased by 100%.
- ▶ Construction laborer employment remained constant.
- ▶ Environmental engineers, sheet metal workers, maintenance workers, wind turbine service technicians, and pipelayer employment decreased. Pipelayer employment decreased the most at 83%.
- ▶ Surveyors, roofers, pipelayers, and installation, maintenance, repair workers had a greater than 50% increase in average wage. Pipelayers had the highest wage increase at 70%, rising from an average of \$20.52 to \$34.92.
- ▶ Civil engineer wage averages decreased by 2% and petroleum engineer wage averages decreased by 3%.
- ▶ Construction and building inspector wages remained constant.

Table 5 5-Year Trend in Employment Numbers and Average Hourly Wage/Salary (2019 – 2024)

SOC Code	Occupation	Employment			Average Hourly Wage/Salary		
		2019	2024	% change	2019	2024	% change
11-9021	Construction Manager	1,620	1,520	-6%	\$55.03	\$60.91	11%
11-9041	Architectural and Engineering Managers	800	720	-10%	\$78.68	\$89.92	14%
11-9121	Natural Science Managers	80	100	25%	\$55.31	\$76.55	38%
13-1151	Training and Development Specialists	880	1,480	68%	\$31.08	\$32.58	5%
13-1199	Business Operations Specialists, All Other	4,960	6,340	28%	\$40.23	\$43.71	9%
17-1011	Architects, Except Landscape and Naval	200	220	10%	\$44.36	\$56.38	27%
17-1022	Surveyors	160	200	25%	\$28.31	\$43.42	53%
17-2051	Civil Engineers	860	1,200	40%	\$50.98	\$50.19	-2%
17-2061	Computer Hardware Engineers	280	440	57%	\$47.72	\$65.78	38%
17-2071	Electrical Engineers	920	960	4%	\$48.15	\$58.14	21%
17-2072	Electronics Engineers, Except Computer	1,300	1,200	-8%	\$56.66	\$59.73	5%
17-2081	Environmental Engineers	360	120	-67%	\$46.97	\$57.06	21%
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	80	100	25%	\$47.58	\$59.97	26%
17-2112	Industrial Engineers	920	640	-30%	\$50.04	\$58.50	17%
17-2131	Materials Engineers	80	100	25%	\$52.15	\$60.67	16%
17-2141	Mechanical Engineers	1,140	1,240	9%	\$47.86	\$57.45	20%
17-2171	Petroleum Engineers	1,840	1,100	-40%	\$74.87	\$72.71	-3%
17-2199	Engineers, All Other	1,220	1,260	3%	\$51.70	\$63.06	22%
37-3011	Landscaping and Groundskeeping Workers	2,740	3,140	15%	\$15.59	\$20.29	30%
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	460	360	-22%	\$17.17	\$20.01	17%

SOC Code	Occupation	Employment			Average Hourly Wage/Salary		
		2019	2024	% change	2019	2024	% change
47-2051	Cement Masons and Concrete Finishers	1,560	1,140	-27%	\$21.98	\$31.11	42%
47-2061	Construction Laborers	3,740	3,740	0%	\$18.94	\$26.74	41%
47-2073	Operating Engineers and Other Construction Equipment Operators	1,820	2,020	11%	\$25.35	\$36.12	42%
47-2081	Drywall and Ceiling Tile Installers	520	1,040	100%	\$22.14	\$31.61	43%
47-2111	Electricians	2,840	2,640	-7%	\$35.18	\$36.78	5%
47-2141	Painters, Construction and Maintenance	900	780	-13%	\$20.86	\$26.82	29%
47-2151	Pipelayers	360	60	-83%	\$20.52	\$34.92	70%
47-2152	Plumbers, Pipefitters, and Steamfitters	1,600	1,720	8%	\$26.77	\$32.40	21%
47-2161	Plasterers and Stucco Masons	360	260	-28%	\$23.07	\$29.96	30%
47-2181	Roofers	540	380	-30%	\$21.51	\$32.00	49%
47-2211	Sheet Metal Workers	640	320	-50%	\$29.58	\$40.18	36%
47-2231	Solar Photovoltaic Installers	420	600	43%	\$20.25	\$26.12	29%
47-4011	Construction and Building Inspectors	400	500	25%	\$39.05	\$39.21	0%
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	1,240	1,540	24%	\$22.22	\$31.04	40%
49-3041	Farm Equipment Mechanics and Service Technicians	380	740	95%	\$22.26	\$26.08	17%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	960	1,260	31%	\$26.34	\$32.46	23%
49-3092	Recreational Vehicle Service Technicians	100	80	-20%	\$23.66	\$26.63	13%
49-3093	Tire Repairers and Changers	820	660	-20%	\$15.44	\$19.29	25%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	900	1,640	82%	\$25.85	\$32.12	24%
49-9041	Industrial Machinery Mechanics	2,180	2,040	-6%	\$27.82	\$34.63	24%
49-9043	Maintenance Workers, Machinery	760	220	-71%	\$22.79	\$28.88	27%
49-9051	Electrical Power-Line Installers and Repairers	340	400	18%	\$42.98	\$57.68	34%
49-9071	Maintenance and Repair Workers, General	5,220	5,140	-2%	\$20.61	\$26.01	26%
49-9081	Wind Turbine Service Technicians	400	140	-65%	\$28.02	\$39.95	43%
49-9098	Helpers, Installation, Maintenance, and Repair Workers	480	580	21%	\$14.60	\$21.90	50%
49-9099	Installation, Maintenance, and Repair Workers, All Other	800	840	5%	\$19.46	\$27.35	41%
51-4121	Welders, Cutters, Solderers, and Brazers	2,440	1,840	-25%	\$25.71	\$29.76	16%

Notes: SOC = Standard Occupational Classification.

Source: California Employment Development Department 2025a.

Workforce demographics are estimated to change as employees retire and much of Kern county's younger population reaches an age of employment. Occupations that have experienced a decline or stagnation in employment, like construction, engineering, and trades such as HVAC technicians, may receive an influx of new job openings with implementation of SOAR Bakersfield. It is important that the workforce possess the necessary level of training and skills to occupy jobs that will be in high demand. Table 6 displays historical changes in job openings between 2022 and 2032, and the type of education levels and work experience required to qualify for these jobs, and on-the-job training needs. The 2024 average hourly wage/salary from Table 5 is also included in Table 6 for comparison purposes. Key terms used in Table 6 are defined below, followed by key takeaways.

Numeric Change: The difference between employment estimates for 2022 and projected employment estimates for 2032.

Percentage Change: The percentage difference in employment between 2022 and 2032.

Total Job Openings: Total jobs openings between 2022 and 2032 is calculated by adding the number of exits (retirement) from an occupation to the number of transfers (employees that switch to a different occupation) and the numeric change in employment due to economic drivers (whether there was positive or negative employment since 2022). As an example from Table 6, the total job openings for electricians between 2022 and 2032 is 1,360, which is calculated based on addition of 140 jobs through economic drivers, the loss of 470 employees in this occupation through exits, and loss of 750 employees through transfers (e.g. $140 + 470 + 750 = 1,360$). Refer to Attachment A for a full table of the occupation level base year employment and projections, including projected exits and transfers.

Some key takeaways and highlights identified from Table 6 are outlined below.

- ▶ Solar photovoltaic installer jobs are projected to increase by 46% and wind turbine service technician jobs are projected to increase by 75%. The entry level of education for both occupations are a high school diploma, with wind turbine service technicians requiring some postsecondary education. Both occupations have no entry level training requirements and offer moderate-term on-the-job training, and on average pay above a livable wage standard of \$25.07 per hour for Kern County. It is worth noting that the projections for jobs related to renewable energy installations may be impacted by federal action that reduced funding for the projects, which are not reflected in the above projections.
- ▶ There is a large projected increase in job openings for occupations that on average pay near or below the living wage standard, including: landscaping and groundskeeping workers, construction laborers, and general maintenance and repair workers.
- ▶ Electricians; plumbers, pipefitters, and steamfitters; and HVAC mechanics and installers are all expected to experience over 800 job openings each between 2022 and 2023 (3,020 combined), and all pay over \$30.00 per hour on average.
- ▶ Petroleum engineer jobs are projected to decrease by 2%, with 300 openings projected between 2022 and 2023. This occupation requires a minimum bachelor's degree education.
- ▶ Pesticide handlers, sprayers, and applicators are projected to have no net increase in jobs, with 260 openings projected between 2022 and 2023. The mean hourly wage in 2024 for this occupation as \$20.01, which is below livable wage standard of above \$25.07 per hour.
- ▶ Natural science managers, surveyors, environmental engineers, materials engineers, health and safety engineers, pipelayers, and recreational vehicle technicians are expected to have less than 100 job openings each between 2022 and 2032.

Table 6 **Projected Total Job Openings Between 2022 and 2032 and Employment**

SOC Code	Occupation	Numeric Change	Percentage Change	Total Job Openings	Entry Level Education	Work Experience	On-the-Job Training	2024 Average Hourly Wage/Salary ¹
11-9021	Construction Manager	140	12%	1,020	Bachelor's degree	None	Moderate-term on-the-job training	\$60.91
11-9041	Architectural and Engineering Managers	50	14%	290	Bachelor's degree	5 years or more	None	\$89.92
11-9121	Natural Science Managers	0	0%	30	Bachelor's degree	5 years or more	None	\$76.55
13-1151	Training and Development Specialists	90	12%	740	Bachelor's degree	Less than 5 years	None	\$32.58
13-1199	Business Operations Specialists, All Other	190	6%	2,980	Bachelor's degree	None	None	\$43.71
17-1011	Architects, Except Landscape and Naval	30	25%	110	Bachelor's degree	None	Internship/residency	\$56.38
17-1022	Surveyors	10	9%	90	Bachelor's degree	None	Internship/residency	\$43.42
17-2051	Civil Engineers	90	15%	480	Bachelor's degree	None	None	\$50.19
17-2061	Computer Hardware Engineers	20	9%	150	Bachelor's degree	None	None	\$65.78
17-2071	Electrical Engineers	40	8%	310	Bachelor's degree	None	None	\$58.14
17-2072	Electronics Engineers, Except Computer	60	10%	400	Bachelor's degree	None	None	\$59.73
17-2081	Environmental Engineers	10	17%	50	Bachelor's degree	None	None	\$57.06
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	10	20%	40	Bachelor's degree	None	None	\$59.97
17-2112	Industrial Engineers	60	19%	240	Bachelor's degree	None	None	\$58.50
17-2131	Materials Engineers	10	20%	50	Bachelor's degree	None	None	\$60.67
17-2141	Mechanical Engineers	90	15%	450	Bachelor's degree	None	None	\$57.45
17-2171	Petroleum Engineers	(10)	(2%)	300	Bachelor's degree	None	None	\$72.71
17-2199	Engineers, All Other	40	5%	470	Bachelor's degree	None	None	\$63.06
37-3011	Landscaping and Groundskeeping Workers	490	22%	3,670	No formal educational credential	None	Short-term on-the-job training	\$20.29
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	0	0%	260	High school diploma or equivalent	None	Moderate-term on-the-job training	\$20.01

SOC Code	Occupation	Numeric Change	Percentage Change	Total Job Openings	Entry Level Education	Work Experience	On-the-Job Training	2024 Average Hourly Wage/Salary ¹
47-2051	Cement Masons and Concrete Finishers	60	10%	530	No formal educational credential	None	Moderate-term on-the-job training	\$31.11
47-2061	Construction Laborers	430	16%	2,890	No formal educational credential	None	Short-term on-the-job training	\$26.74
47-2073	Operating Engineers and Other Construction Equipment Operators	140	13%	1,090	High school diploma or equivalent	None	Moderate-term on-the-job training	\$36.12
47-2081	Drywall and Ceiling Tile Installers	90	13%	560	No formal educational credential	None	Moderate-term on-the-job training	\$31.61
47-2111	Electricians	140	11%	1,360	High school diploma or equivalent	None	Apprenticeship	\$36.78
47-2141	Painters, Construction and Maintenance	70	10%	630	No formal educational credential	None	Moderate-term on-the-job training	\$26.82
47-2151	Pipelayers	0	0%	40	No formal educational credential	None	Short-term on-the-job training	\$34.92
47-2152	Plumbers, Pipefitters, and Steamfitters	80	9%	860	High school diploma or equivalent	None	Apprenticeship	\$32.40
47-2161	Plasterers and Stucco Masons	20	14%	130	No formal educational credential	None	Long-term on-the-job training	\$29.96
47-2181	Roofers	40	17%	230	No formal educational credential	None	Moderate-term on-the-job training	\$32.00
47-2211	Sheet Metal Workers	10	7%	150	High school diploma or equivalent	None	Apprenticeship	\$40.18
47-2231	Solar Photovoltaic Installers	130	46%	430	High school diploma or equivalent	None	Moderate-term on-the-job training	\$26.12
47-4011	Construction and Building Inspectors	10	4%	300	High school diploma or equivalent	5 years or more	Moderate-term on-the-job training	\$39.21
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	50	6%	760	High school diploma or equivalent	None	Long-term on-the-job training	\$31.04
49-3041	Farm Equipment Mechanics and Service Technicians	60	11%	540	High school diploma or equivalent	None	Long-term on-the-job training	\$26.08
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	100	15%	680	High school diploma or equivalent	None	Long-term on-the-job training	\$32.46

SOC Code	Occupation	Numeric Change	Percentage Change	Total Job Openings	Entry Level Education	Work Experience	On-the-Job Training	2024 Average Hourly Wage/Salary ¹
49-3092	Recreational Vehicle Service Technicians	0	0%	60	High school diploma or equivalent	None	Long-term on-the-job training	\$26.63
49-3093	Tire Repairers and Changers	30	9%	400	High school diploma or equivalent	None	Short-term on-the-job training	\$19.29
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	80	10%	800	Postsecondary non-degree award	None	Long-term on-the-job training	\$32.12
49-9041	Industrial Machinery Mechanics	190	18%	1,070	High school diploma or equivalent	None	Long-term on-the-job training	\$34.63
49-9043	Maintenance Workers, Machinery	10	9%	120	High school diploma or equivalent	None	Long-term on-the-job training	\$28.88
49-9051	Electrical Power-Line Installers and Repairers	30	15%	190	High school diploma or equivalent	None	Long-term on-the-job training	\$57.68
49-9071	Maintenance and Repair Workers, General	170	6%	2,700	High school diploma or equivalent	None	Moderate-term on-the-job training	\$26.01
49-9081	Wind Turbine Service Technicians	60	75%	160	Postsecondary non-degree award	None	Long-term on-the-job training	\$39.95
49-9098	Helpers, Installation, Maintenance, and Repair Workers	30	10%	370	High school diploma or equivalent	None	Short-term on-the-job training	\$21.90
49-9099	Installation, Maintenance, and Repair Workers, All Other	70	15%	550	High school diploma or equivalent	None	Moderate-term on-the-job training	\$27.35
51-4121	Welders, Cutters, Solderers, and Brazers	140	14%	1,160	High school diploma or equivalent	None	Moderate-term on-the-job training	\$29.76

Notes: SOC = Standard Occupational Classification; () = a negative value.

¹ 2024 Average Hourly Wage/Salary is carried directly from Table 5 for comparison purposes.

Source: California Employment Development Department 2025b

4.2 ADDITIONAL WORKFORCE TRENDS

Jobs in the agricultural sector are projected to grow by 1.2% per year between 2021 and 2031 in Bakersfield alone (City of Bakersfield 2021:5-4). A shift toward food manufacturing job creation could provide higher quality positions for those in the agricultural industry, in tandem with elevating food production jobs as these are often low-paid and represent much of the existing labor force.

Occupations in the logistics sector, such as warehousing and transportation, have contributed to Kern County's economic wellness alongside agriculture. Between 2009 and 2019 the logistics sector experienced an increase of 4,500 jobs (B3K Prosperity 2021: 39), and is expected to increase by 14,100 jobs by 2030 when accounting for utilities and trade occupations (Kern County 2024: 122). However, this sector struggles with similar obstacles as agriculture, including low wages and limited opportunities for career development. Another occupation that has experienced job growth is manufacturing, with an additional 500 jobs in the same ten-year period (B3K Prosperity 2021: 38). As more of the workforce has opportunities to develop skills and pursue technical education, manufacturing job employment will continue to increase. One caveat to this trend is the decline in aerospace manufacturing jobs; increasing competition from in-state and out-of-state facilities has limited the economic income from this industry and will require regional investment to maintain aerospace as a critical area of research and development in Kern County (B3K Prosperity 2021: 29). Other occupations that have experienced job growth but fall into the category of local occupations are private education, and health services (B3K Prosperity 2021: 26). Between 2019 and 2024, jobs in the education sector increased by 21% and jobs in the health services sector increased by 25% (Kern County 2024: 119).

Overall oil production in the county has steadily declined since 1998 (Kern Council of Governments 2019: 5) and has seen a loss of over 2,000 jobs over ten years (B3K Prosperity 2021: 28). Although the future of oil and gas industry jobs is dependent on the development of new technologies, the low-carbon energy industry presents an opportunity for individuals to apply their skills to a new industry. The construction of carbon capture equipment will require similar knowledge and skills as those applied to oil and gas structure installation (Kern County 2024: 139) specific to engineering, manufacturing, and equipment operation industries (B3K Prosperity 2021: 36),

5 SOAR BAKERSFIELD WORKFORCE DEMAND

SOAR Bakersfield includes a set of measures that are intended to initiate a transformation that deeply reduces greenhouse gas emissions and improves resilience to the potential impacts of climate change. A subset of these measures, labeled as "primary measures", have been analyzed in detail to provide information on the climate and air pollution reduction potential and necessary implementation considerations. Individually, the implementation of these measures is not expected to experience workforce shortages across the various occupations. There is an available workforce for key occupations that are required for various climate pollutant reduction projects, including renewable energy, transportation infrastructure, electric vehicle (EV) charger installation, and land conservation. These projects do not require a substantially unique workforce compared to other projects that have previously occurred or are planned in the region. While the analysis presented in earlier sections focused on the Kern County region, limited jobs that require highly specialized skills can be filled with members of statewide workforce.

Through 2045 the State of California is expected to continue to implement regulations and legislation that transition all of California to a low carbon economy, consistent with state legislation including Senate Bill 32 and Assembly Bill 1279. One aspect of SOAR Bakersfield is for the City to prepare for this economic transition and leverage available resources that can continue to diversify the local economy. Accordingly, SOAR Bakersfield analyzes a scenario where the State's goals for various sectors are achieved, including but not limited to heat pump installations, renewable energy resources constructed, electric vehicle and charging deployment, and reductions in vehicle travel. This is referred to as the "SOAR Bakersfield implementation scenario" Analyzing the potential workforce needs associated with this scenario provides an understanding of workforce demands beyond a business-as-usual economic scenario and allows for planning to support local residents in accessing the increased availability of various occupations.

5.1 SOAR BAKERSFIELD WORKFORCE NEEDS

Potential job growth in Bakersfield associated the SOAR Bakersfield implementation scenario was calculated by scaling the estimated statewide number of jobs per sector that would be required for statewide economic and technological transition to Bakersfield using relevant target indicators for each sector. While workforce needs are not assessed for each measure individually, the sector-wide transitions demonstrate which occupations may be in higher demand beyond a business-as-usual economic scenario. It is assumed that these transitions would occur by 2045, and as such job estimates are for up to 2045. It is worth noting that these estimates only consider Bakersfield, and transitions that occur in the larger Kern County region could substantially increase workforce demands in various sectors.

Various sources were reviewed and utilized to estimate future sector transitions and the additional jobs associated with those transitions.

5.1.1 Electric Vehicle Infrastructure

EV infrastructure largely consists of charging stations and associated utility service that will make EV ownership more accessible and practical. Installation of chargers requires physical labor and an understanding of technical components, skills that are often present in existing careers such as electricians. These jobs will continue to be relevant as chargers need maintenance and repair.

Estimated number of light-duty EV charging stations: 21,800

Estimated number of medium-and heavy-duty EV charging station: 2,730

Estimated number of light-duty EV infrastructure jobs: 740

Estimated number of medium-and heavy-duty EV infrastructure jobs: 170

Job types: electrical installation, maintenance and repair, software maintenance and repair, charger assembly, general construction labor

Job estimates source: International Council on Clean Transportation 2024 (based on number of charging stations)

5.1.2 Heat Pump Installation

Heat pumps are an efficient and sustainable alternative to traditional HVAC and water heater systems. As more households transition to heat pumps to improve the resiliency of their home, there is a greater need for qualified professionals who can install heat pumps. The skills necessary to install heat pumps are often present in careers such as electricians and plumbers, and would require minimal training or the completion of a certificate course to enter a growing job market.

Estimated number of heat pumps installed: 237,580

Estimated number of jobs: 2,830

Job types: electricians, HVAC technicians, heat pump technician, pipefitters

Job estimates source: Heat Pump Association 2024 (based on number of heat pump installations)

5.1.3 Landfill Diversion

A variety of items that are often landfilled can be recycled or composted instead. Organic items such as food and yard waste that are disposed of in landfills contribute to a variety of environmental issues, such as the contamination of soil and the release of methane. Diverting waste not only prevents environmental pollution but creates jobs such as waste collection and compost production.

Estimated annual tons of organic waste diverted from landfills: 283,490

Estimated number of jobs: 300

Job types: materials collection and materials processing

Job estimates source: National Resources Defense Council 2014 (based on job generation rate of diversion compared to landfilling)

5.1.4 Sustainable Agriculture

The implementation of sustainable agricultural practices is important to the conservation of resources like water and can improve the resilience of crops to conditions such as drought and pest outbreaks. In addition to resource conservation, sustainable practices like cover cropping and reduced tillage can help preserve carbon in the soil. Additional benefits to soils and crop production can be achieved through the implementation of agrivoltaics, which are solar panels mounted over crop and grazing lands. Farmers that already implement sustainable agricultural practices and agricultural researchers at local institutions can share knowledge among the community to make sustainable practices more accessible.

Estimated acres with sustainable agricultural practices applied: 1,960

Estimated number of jobs: not estimated due to lack of available data

Job types: soil scientists, agroecologist, regenerative land managers, environmental analyst

5.1.5 Land Conservation and Restoration

Natural lands provide many benefits, maintaining ecosystem health through nutrient cycling and water purification, supporting native biodiversity, and sequestering carbon. Grasslands and wetlands are two of the most prevalent natural land types in Bakersfield, with grasslands comprising 13% and wetlands comprising 8% of the jurisdiction's total acreage. Conserving these existing lands and restoring degraded areas is important to environmental health and creates job opportunities predominantly in scientific careers. Bakersfield has many opportunities for restoration including oil and gas well plugging and site remediation, which creates jobs for workers currently in the oil and gas industry.

Estimated acres of natural lands restored: 85

Estimated number of jobs: 400

Job types: ecologist, soil scientist, invasive species biologist, habitat monitoring technician, botanist, conservation specialist, hydrologist, water quality specialist, wildlife biologist, environmental permitting specialist, heavy-equipment operator

Job estimates source: Polin, Robert, et. al. 2021 (based on total natural land restoration jobs and state and local acreage targets, upscaled for a statewide target of 4,000,000 jobs created by 2045)

5.1.6 Public Transportation

Increased housing density and local job creation will create a demand for adequate transportation options. The City's investment in public transportation can reduce commute times for residents, increase resident accessibility to critical facilities, and create jobs. Deploying more buses and shuttle services requires drivers and individuals responsible for system operation and maintenance.

Estimated Annual Vehicle Miles Traveled (VMT) Shifted to Public Transportation: 30%

Estimated number of jobs : 950

Job types : first-line supervisors, bus drivers, transportation operators

Job estimates source: Polin, Robert, et. al. 2021 (based on total public transportation jobs and state and local population, upscaled for a statewide target of 4,000,000 jobs created by 2045)

5.1.7 Solar and Battery Storage Equipment Installation

Solar panels use a natural source of energy in the region to generate electricity, improving the resiliency of energy systems. Battery storage in addition to solar panel installation can reduce dependence on fuel combustion and serve as an energy source during events like blackouts. Solar and battery storage equipment installation utilizes skills in a variety of jobs, including electricians that can navigate circuitry and welders that can stabilize structures.

Estimated solar and battery storage installations: 740 megawatts of solar and 380 megawatts of battery storage

Estimated number of jobs : 6,040

Job type: electricians, welders, construction workers, engineers, solar installers

Job estimates source: Polin, Robert, et. al. 2021 (based on total solar jobs and state and local population, upscaled for a statewide target of 4,000,000 jobs created by 2045)

5.1.8 Transportation Infrastructure

Greater investments in transportation infrastructure, maintenance, and service will have positive effects on people and the environment. Electric transit like high-speed rail and shifting from road freight to rail freight can reduce emissions associated with natural gas and diesel, improving air quality and serving as efficient methods of transport. Creating more sidewalks and bike lanes improves connectivity in the city and can reduce pollution from vehicle use. The construction, operation, and maintenance of these transportation systems require a variety of occupations, providing many employment opportunities to the local workforce.

Estimated number of jobs: not estimated due to lack of available data

Job types: construction, heavy equipment operators, civil engineers, architects

5.2 GREEN INDUSTRY TRANSITIONS

The City has identified numerous measures that will improve the quality of life of residents and the environment. Implementation of these measures will require a sizeable workforce with the necessary skills relating to project management, engineering, and construction, among others. Residents in Kern County support environmental resilience, with 92% of residents indicating they are at least somewhat concerned about the environment (Kern County 2024: 73). Similarly, there is increasing support for sustainable job creation in farming, low-carbon energy development, carbon management, and public transportation industries from the public (Kern County 2024: 68). A survey of disadvantaged communities as shown in Table 7 found that interest in some clean energy jobs such as solar energy and oilfield cleanup were competitive with interest rates in warehousing, which has the largest project job growth of any industry (Kern County 2024: 149–150). There are also several existing industries that are relevant to renewable energy and carbon capture and storage, listed in Table 8. The City's investment in SOAR Bakersfield is directly aligned with the wants of residents for the creation of high-quality jobs and allocation of resources to sustainable development.

Table 7 Percent Interest in Clean Energy Jobs

Sector	% of Respondents Preferring Job Growth
Solar Power/Energy	78%
Land and Oilfield Cleanup	57%
Warehousing	55%
Wind Energy	47%
Highspeed Rail	46%
Technology Sectors	43%
Carbon Management	39%
Electrification/Electric Car Charging	35%
Hydrogen Power	33%
Biofuels	32%
Agricultural Technologies (AgTech)	31%

Source: Adapted from Kern County 2024: 150

Table 8 Industrial Sectors Relevant to Geological Storage for Carbon Capture and Sequestration

Industry Classification	NAICS Industry Code
Drilling Oil and Gas Wells	213111
Support Activities for Oil and Gas Operations	213112
Geophysical Surveying and Mapping Services	541360
Oil and Gas Field Machinery and Equipment Manufacturing	333132
Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	3331210
Metal Tank (Heavy Gauge) Manufacturing	332420
Pump and Pumping Equipment Manufacturing	333911
Air and Gas Compressor Manufacturing	333912
Construction, Mining, and Forestry Machinery and Equipment Rental Leasing	532412

Notes: NAICS = North American Industry Classification System.

Source: Adapted from B3K Prosperity 2021: 36

A variety of projects throughout Kern County contribute to energy resilience in the region and have set an example for other jurisdictions. A subset of these projects is provided in Table 9, according to county area. Three of the projects provide estimates of job creation and serve as an example for the workforce required to implement similar projects SOAR Bakersfield:

- ▶ The Willow Rock Energy Storage Center will have 500 megawatts energy storage from wind and solar. It will create 25-40 full time jobs and support 700 jobs over the course of the project.
- ▶ Funding from the California Geologic Energy Management Division will be dedicated to plugging 129 oil wells in Kern County and will create approximately 66 jobs.
- ▶ A variety of carbon storage developers have disclosed that projects will require 25-80 full time employees, and a few hundred workers during the construction phase.

Table 9 Clean Energy and Carbon Management Projects in Kern County

County Area	Projects
East Kern	▶ Edwards Air Force Base: 2 million panel photovoltaic array ▶ Coso Geothermal Project: 80-megawatt geothermal power plant ▶ Willow Rock Energy Storage Center: 500 megawatts of electrical capacity ▶ Tehachapi wind farms: largest collection of wind turbines of any county in the nation, potential site for hydrogen production ▶ Mojave Air and Space Port: plans for microgrid
West Kern	▶ San Joaquin Valley: \$20 million from the Department of Energy for carbon capture projects ▶ California Geologic Energy Management: \$80 million to plug 378 highest-priority oil wells, 129 located in Kern County ▶ California Workforce Development Board: \$20 million from the State Budget to train displaced oil and gas workers in Kern and Los Angeles counties ▶ Oil and Gas Well Capping Pilot: assist state-registered apprenticeship programs in developing curricula for well capping ▶ Renewell Energy: development of a gravity storage system to generate electricity for the grid ▶ Premier Resource Management LLC: convert oil reservoirs to synthetic geothermal storage
North Kern	▶ Covanta and Pelican Renewables: facilities for biomass conversion to biofuels
South Kern	▶ Blossom Valley Organics: largest green waste composting facility in the United States ▶ Kern Energy: plans to refine 100% renewable diesel ▶ City of Arvin: received \$2.9 million from the Federal Transit Administration for two electric buses and to construct microgrid infrastructure ▶ Tasteful Selections: first microgrid in Kern County using solar, natural gas, and battery storage ▶ Arvin Educational Center: satellite campus funded by Bakersfield College to serve Arvin residents
Central Kern	▶ Energy resiliency technology grant: grant to City of Bakersfield and Kern Community College District to increase local understanding of energy resiliency and microgrids ▶ California Office of the Small Business Advocate: provides microgrid training for residents ▶ Kern County Dairy Biogas: conversion of methane to renewable compressed natural gas ▶ Installation of 30 EV charging ports ▶ Installation of LED streetlights

Notes: EV = electric vehicle; LED = light-emitting diode; LLC = limited liability company.

Source: Kern County 2024: 135–136; adapted by Ascent in 2025

Agrivoltaics also offer potential for expansion of renewable energy installations in Kern County, while providing the dual benefit of enhancing agricultural production. Agrivoltaics are solar photovoltaic panels installed over crop and grazing lands that are spaced appropriately to produce electricity that can be used on-site or sold while allowing for appropriate sunlight and shading for crop production. Data on the extent of agrivoltaics in Kern County is not readily available; however, Kern CCD California Renewable Energy Lab (CREL) is in development of an agrivoltaics demonstration project at the Regenerative Agriculture Education Center at Bakersfield College's Delano Campus.

Completion of high-speed rail will provide efficient and zero-emissions transportation across California, with segments connecting between Merced and Bakersfield, and from Bakersfield to Palmdale. These segments are part of Phase 1 of the high-speed rail system, which will connect from San Francisco to Anaheim, running through the Central Valley. The City's Downtown Bakersfield Corridor Enhancement Project identifies one high-speed rail station in the Bakersfield, near Route 204 and F Street. Economic benefits of the project are visible in job creation across the state; the construction of highspeed rail created over 13,000 construction jobs between 2015 and 2024, with 2,538 of these jobs based in Kern County (California High-Speed Rail Authority 2024b). Approximately 3,000 permanent full

time jobs will be created statewide for continued operation and maintenance of trains and the rail system, following the completion of high-speed rail Phase 1 (California High-Speed Rail Authority 2024a). Four facility types have been identified by the California High-Speed Rail Authority for the Central Valley to maintain high-speed rail infrastructure and serve as operations centers (California High-Speed Rail Authority 2019). Table 10 categorizes jobs required for each facility type and the number of permanent jobs expected for each facility in the Central Valley at full operation of Phase 1. The exact location of these facilities is yet to be determined; however, one or more may be constructed in Kern County.

Table 10 High-Speed Rail Facilities and Associated Central Valley Jobs

Facility Type	Description	Job Types	Number of Jobs
Maintenance of way facilities	Oversee maintenance of the rail itself, initially used for system construction operations. It would serve as a management center for inspection, maintenance and repair of system infrastructure.	▶ warehouse staff ▶ welders ▶ machinists ▶ technicians ▶ electricians	105-110
Light maintenance facilities (LMFs)	Provide regular maintenance and operations for high-speed trains, including testing and commissioning of trains.	▶ mechanical technicians ▶ cleaners ▶ inspectors	100
Heavy maintenance facility (HMF)	Provide in-depth maintenance and overhaul, including periodic major inspections and major component replacement. Initially, the HMF will receive trains and ready them for passenger service, which includes testing, commissioning, and acceptance. A HMF facility is planned to be somewhere in the Central Valley.	▶ machinists ▶ electronic technicians ▶ welders	300-400
Operations control center	A center for operations control and train dispatching, including coordinating high-speed train movements with others such as Metrolink and Caltrain in blended corridors.	▶ dispatchers ▶ administrative ▶ operations specialists	40

Source: California High-Speed Rail Authority 2019; adapted by Ascent 2025.

5.3 SUMMARY OF NEEDS

Sector-wide economic transitions will influence workforce demand in Bakersfield and Kern county through both near-term projects and long-term structural changes. While individual SOAR Bakersfield projects are not expected to create significant workforce shortages on their own, they will contribute to broader shifts in demand for certain occupations, especially as external renewable energy and infrastructure projects continue to expand. Several needs emerge:

- ▶ The expanded deployment of EVs will create demand for various occupations required to install and support charging infrastructure and maintain and service EVs. This is likely to increase demand for electricians for the installation of EV charging infrastructure, as well as create need for specialized automotive service and technicians. Similarly, the increased use of alternative fuels, such as hydrogen, will require specialized skills for the installation of fueling infrastructure and maintenance of vehicles.
- ▶ Public transportation initiatives, including California's high-speed rail and local transit expansion, will create specialized workforce needs, requiring new training programs and operators. Training for high-speed rail occupations is generally led by the California High-Speed Rail Authority.
- ▶ Heat pump installations could substantially increase employment demand for HVAC technicians, electricians, and plumbers. Electricians are likely to be in particularly high demand when considering the need from increased renewable energy installations and EV charging infrastructure.

- ▶ There is likely to be significant expansion of energy-powered microgrids with battery storage, which will require specialized jobs for design, installation, and service.
- ▶ The simultaneous rise in carbon capture and sequestration jobs and decline in oil and gas employment presents a critical challenge, particularly given the slow rollout of carbon capture and sequestration projects.
- ▶ Climate change impacts, combined with the idling or closure of oil wells, may increase demand for land restoration, agricultural enhancement, and remediation specialists.
- ▶ There is high interest from the public in jobs in occupations that support the goals of SOAR Bakersfield, and it will be critical to provide opportunities for workers in lower-wage jobs to secure employment in growing higher-wage occupations.
- ▶ General and specialized construction labor will continue to be in demand; however, the total labor needs for specific construction occupations is not known and will need further investigation for specific projects.

Overall, SOAR Bakersfield will add to existing workforce demands, but the most significant challenges will stem from long-term industry transitions and competition from concurrent large-scale projects across California.

6 WORKFORCE DEVELOPMENT OPPORTUNITIES AND CHALLENGES

Occupations relevant to SOAR Bakersfield are identified in the section, including necessary skills and education associated with jobs relevant to each occupation. Existing opportunities, including training programs and certifications, are listed as avenues to assist workforce development, followed by an assessment of socioeconomic barriers that may limit an individual's access to high-road jobs.

6.1 TECHNICAL REQUIREMENTS FOR OCCUPATIONS

There is significant potential to elevate the workforce in Kern County by investing in training and educational resources. The various aforementioned industries and occupations consist of jobs that will require a skilled workforce. Although there are individuals who currently possess transferable skills relevant to SOAR Bakersfield, there will be a significant increase in demand for trained professionals. A list of jobs that are essential to SOAR Bakersfield implementation are provided in Table 11, along with the skills necessary to succeed at said job.

Table 11 Jobs and Associated Skills

SOC Code	Occupation	Relevant Jobs	Minimum Education	Job Description	Career Advancement Licenses and Certifications	Skills Required
11-9020	Construction Manager	▶ 11-9021 – Construction Manager	Bachelor’s Degree	Construction managers plan, coordinate, budget, and supervise construction projects from start to finish.	Professional certification, although not required, demonstrates a particular level of knowledge and experience.	▶ plan strategies ▶ investigate project cost variances ▶ solve problems ▶ follow project budgets ▶ hire and manage staff ▶ coordinate ▶ communicate with owners, clients, and workers ▶ discuss technical details with inspectors and specialists ▶ assign personnel ▶ delegate tasks ▶ possess applied knowledge of constructions technologies, contracts, and technical drawings
11-9040	Architectural and Engineering Managers	▶ 11-9041 – Architectural and Engineering Managers ▶ 11-9121 – Natural Science Managers	Bachelor's Degree	Architectural and engineering managers plan, direct, and coordinate activities in the fields of architecture and engineering.	Architectural and engineering managers typically do not need a license. However, these managers may advance from other occupations that do require licensure. For example, all states require architects to be licensed, and some engineers obtain a professional engineering (PE) license.	▶ evaluate information to solve problems ▶ effectively convey project information and expectations ▶ collaborate with staff ▶ organize, direct, and motivate others ▶ use mathematics to develop new products and processes, track workers, schedules, and budgets simultaneously
13-1150	Training and Development Specialists	▶ 13-1151 Training and Development Specialists ▶ 13-1199 Business Operations Specialists, All Other	Bachelor's Degree	Training and development specialists plan and administer programs that improve the skills and knowledge of their employees.	Although not usually required, certification shows professional expertise and credibility. However, some employers prefer to hire certified candidates, and some positions require certification.	▶ evaluate training programs, methods, and materials ▶ strong interpersonal skills to deliver training programs and coordinate with teams ▶ convey information clearly and facilitate learning to diverse audiences ▶ be resourceful when developing training materials ▶ deliver training programs ▶ strong training skills
17-1010	Architects, Except Naval	▶ 17-1011 – Architects, Except Landscape and Naval ▶ 17-1012 – Landscape Architects	Bachelor's Degree	Architects plan and design houses, factories, office buildings, and other structures.	All states and the District of Columbia require architects to be licensed. Licensing requirements typically include completing a degree program in architecture, gaining relevant experience through a paid internship, and passing the Architect Registration Examination. Most states also require some form of continuing education to keep a license.	▶ understand design content ▶ oral presentations ▶ writing ▶ ensure designs are aesthetic and functional ▶ manage contracts ▶ keep records of project details such as cost and materials used ▶ familiarity with CADD technology and building information modeling (BIM) ▶ visualize building structure
17-1020	Surveyors, Cartographers, and Photogrammetrists	▶ 17-1021 – Cartographers and Photogrammetrists ▶ 17-1022 – Surveyors	Bachelor's Degree	Surveyors make precise measurements to determine property boundaries.	All 50 states and the District of Columbia require surveyors to be licensed before they can provide their services to the public. Prospective licensed surveyors may need a bachelor’s degree from an accredited program in order to sit for the licensing exam. Candidates typically work for several years under the direction of a licensed surveyor to qualify for licensure.	▶ provide clear instruction ▶ written and oral communication ▶ precision and accuracy in making measurements and producing maps and reports ▶ physical endurance to travel long distances, carry equipment, and stand ▶ reconcile discrepancies between documents ▶ effectively plan schedules to meet deadlines ▶ visualize changes in terrain

SOC Code	Occupation	Relevant Jobs	Minimum Education	Job Description	Career Advancement Licenses and Certifications	Skills Required
17-2050	Civil Engineers	▶ 17-2051-Civil Engineers ▶ 17-2061-Computer Hardware Engineers ▶ 17-2071-Electrical Engineers ▶ 17-2072-Electronics Engineers, Except Computer ▶ 17-2081-Environmental Engineers ▶ 17-2111-Health and Safety Engineers, Except Mining Safety Engineers and Inspectors ▶ 17-2112-Industrial Engineers ▶ 17-2121-Marine Engineers and Naval Architects ▶ 17-2131-Materials Engineers ▶ 17-2141-Mechanical Engineers ▶ 17-2151-Mining and Geological Engineers, Including Mining Safety Engineers ▶ 17-2161-Nuclear Engineers ▶ 17-2171-Petroleum Engineers ▶ 17-2199-Engineers, All Other	Bachelor's Degree	Civil engineers plan, design, and supervise the construction and maintenance of building and infrastructure projects.	With experience, some PEs advance to supervisory or administrative positions. Their responsibilities may focus on a specific project, such as a construction site, or encompass broad oversight, such as in working as a city engineer, public works director, or city manager. PEs who have certification that demonstrates expertise in a civil engineering specialty also may be able to advance into senior technical or managerial positions.	▶ written and oral communication ▶ convey technical information to experts and non-experts ▶ balance objectives such as plan feasibility and cost and safety ▶ manage projects ▶ use mathematics such as calculus and trigonometry for analysis, design, and troubleshooting ▶ allocate resources effectively ▶ evaluate issues and find solutions
19-1030	Conservation Scientists and Foresters	▶ Conservation Scientists ▶ Foresters	Bachelor's Degree	Conservation scientists manage, improve, and protect natural resources. They work with private landowners and federal, state, and local governments to find ways to use and improve the land while safeguarding the environment.	Several states may require some type of credentialing process for conservation scientists and foresters. In some of these states, conservation scientists and foresters must be licensed. Some conservation scientists and foresters earn optional certification related to their area of work.	▶ evaluate results from field tests ▶ convey information to private, public, and government entities ▶ use scientific reasoning ▶ lead a team ▶ physical endurance
37-3010	Grounds Maintenance Workers	▶ 37-3011 – Landscaping and Groundskeeping Workers ▶ 37-3012 – Pesticide Handlers, Sprayers, and Applicators, Vegetation ▶ 37-3013 – Tree Trimmers and Pruners ▶ 37-3019 – Grounds Maintenance Workers, All Other	None — High School Diploma	Grounds maintenance workers install and maintain landscapes, prune trees or shrubs, and do other tasks to ensure that vegetation is attractive, orderly, and safe	Grounds maintenance workers who have other qualifications, such as formal education or several years of related experience, may become crew leaders or advance into other supervisory positions.	▶ working at heights ▶ convey information to clients and team ▶ physical coordination when using equipment such as backhoes, mowers, and tractors ▶ stamina for strenuous labor in a range of environmental conditions ▶ lift heavy equipment or supplies ▶ complete tasks independently ▶ visualize landscaping result prior to initiating work
47-2050	Cement Masons, Concrete Finishers, and Terrazzo Workers	▶ 47-2051 – Cement Masons and Concrete Finishers ▶ 47-2053 – Terrazzo Workers and Finishers	High School Diploma	Masonry workers use bricks, concrete and concrete blocks, and natural and manmade stones to build structures.	After becoming a journey worker, masonry workers may find opportunities to advance to supervisor, superintendent, or other construction management positions. Experienced masonry workers may choose to become independent contractors. Masonry workers in a union may also find opportunities for advancement within their union.	▶ working at heights ▶ distinguish between colors and textures ▶ precision with material placement ▶ hand-eye coordination when placing materials ▶ physical endurance ▶ lift heavy supplies
47-2060 47-3010	Construction Laborers Construction Trade Helpers	▶ 47-2061 Construction Laborers ▶ 47-3019 Helpers, Construction Trades, All Other	None — High School Diploma	Construction laborers and helpers perform tasks, such as using, supplying, or holding materials or tools and cleaning work areas and equipment, on construction sites.	After gaining experience, laborers may have opportunities to supervise staff, oversee jobsites, or start their own business.	▶ distinguish colors ▶ teamwork ▶ interact with customers ▶ basic math calculations ▶ operate and maintain equipment ▶ complete strenuous tasks ▶ lift heavy materials and equipment

SOC Code	Occupation	Relevant Jobs	Minimum Education	Job Description	Career Advancement Licenses and Certifications	Skills Required
47-2070	Construction Equipment Operators	▶ 47-2071-Paving, Surfacing, and Tamping Equipment Operators ▶ 47-2072-Pile Driver Operators ▶ 47-2073-Operating Engineers and Other Construction Equipment Operators	High School Diploma	Construction equipment operators drive, maneuver, or control the heavy machinery used to construct roads, buildings, and other structures.	Construction equipment operators often need a commercial driver's license (CDL) to haul their equipment to various jobsites. A few states have special licenses for operators of backhoes, loaders, and bulldozers.	▶ operate large machinery ▶ perform basic maintenance on the equipment ▶ transport and lift heavy objects
47-2110	Electricians	▶ 47-2111 – Electricians	High School Diploma	Electricians install, maintain, and repair electrical power, communications, lighting, and control systems.	After meeting additional requirements and working as a qualified electrician, journey workers may advance to become master electricians. Electricians may also find opportunities to advance to supervisor or to other roles in project management.	▶ distinguish color ▶ perform tests to diagnose problems ▶ customer service ▶ physical stamina ▶ transport and lift heavy components.
47-2120	Glaziers	▶ 47-2121 – Glaziers	High School Diploma	Glaziers install glass in windows, skylights, and other fixtures in buildings.	Some states may require glaziers to have a license; check with your state for more information. Licensure requirements typically include passing a test and having a combination of education and work experience.	▶ working at heights ▶ convey information accurately ▶ precision in measurements, cuts, and modifications ▶ physical stamina ▶ steady hands ▶ lift heavy materials ▶ reading comprehension
47-2130	Insulation Workers	▶ 47-2131-Insulation Workers, Floor, Ceiling, and Wall ▶ 47-2132-Insulation Workers, Mechanical	None — High School Diploma	Insulation workers install and replace the materials used to insulate buildings or mechanical systems.	After completing an apprenticeship, mechanical insulators reach journey-level status. After becoming journey workers, mechanical insulators may advance to supervisor or superintendent positions, or they may choose to start their own business offering mechanical insulation services.	▶ working at heights ▶ maneuver in tight spaces ▶ perform measurements and calculations ▶ operate hand tools and power tools ▶ physical stamina ▶ lift heavy tools and materials
47-2150	Pipelayers, Plumbers, and Steamfitters	▶ 47-2151-Pipelayers ▶ 47-2152-Plumbers, Pipefitters, and Steamfitters	High School Diploma	Plumbers, pipefitters, and steamfitters install and repair piping fixtures and systems.	After completing an apprenticeship and becoming licensed at the journey level, plumbers may advance to become a master plumber, supervisor, or project manager. Some plumbers choose to start their own business as an independent contractor, which may require additional licensing.	▶ provide direction to workers ▶ bid on jobs ▶ plan work schedules ▶ customer service ▶ operate tools ▶ maneuver in tight spaces ▶ lift and transport heavy tools and materials ▶ diagnose and repair problems ▶ complete tests on new systems
47-2170	Reinforcing Iron and Rebar Workers	▶ 47-2171 - Reinforcing Iron and Rebar Workers	High School Diploma	Ironworkers install structural and reinforcing iron and steel to form and support buildings, bridges, and roads.	After gaining experience, ironworkers may advance to become a supervisor or a manager, a position in which they have more responsibilities and are tasked with directing other ironworkers.	▶ working at heights ▶ sense of balance ▶ identify problems ▶ monitor and assess risks ▶ communicate with heavy-machinery operators ▶ complete tasks quickly and precisely ▶ physical endurance ▶ lift heavy objects and secure them into place

SOC Code	Occupation	Relevant Jobs	Minimum Education	Job Description	Career Advancement Licenses and Certifications	Skills Required
47-2180	Roofers	▶ 47-2181 – Roofers	None	Roofers replace, repair, and install the roofs of buildings.	After gaining experience in the occupation, roofers may have opportunities to advance to become a supervisor, job superintendent, or estimator or to start their own business. Roofers working in a union may advance within their local union to become a business manager or apprenticeship instructor or to other positions of union leadership.	▶ working at heights ▶ precision with material placement ▶ sense of balance ▶ mathematics to calculate roof areas ▶ physical endurance ▶ stamina for strenuous labor in a range of environmental conditions ▶ lift heavy materials
47-2210	Sheet Metal Workers	▶ 47-2211 – Sheet Metal Workers	High School Diploma	Sheet metal workers fabricate or install products that are made from thin metal sheets.	Some states require licenses for sheet metal workers. Although not required, sheet metal workers may earn certifications for several tasks that they perform.	▶ precision with material alteration and measurement ▶ follow detailed directions ▶ monitor for safety risks ▶ calculate measurements ▶ operate equipment ▶ physical endurance ▶ lift and transport heavy materials
47-2230	Solar Photovoltaic Installers	▶ 47-2231 – Solar Photovoltaic Installers	High School Diploma	Solar photovoltaic (PV) installers assemble, set up, and maintain rooftop or other systems that convert sunlight into energy.	Although not required for employment, certification demonstrates competency in solar panel installation. PV installers may advance to become a project supervisor or project manager after gaining experience in the trade. PV installers may also transition to sales roles within the industry, given their knowledge of and experience with PV installation. They also may choose to start their own PV installation business.	▶ working at heights ▶ communicate information effectively ▶ follow instructions ▶ mathematics such as algebra, trigonometry, and geometry ▶ work with complex mechanical equipment ▶ physical endurance ▶ lift heavy equipment and materials
47-4010	Construction and Building Inspectors	▶ 47-4011-Construction and Building Inspectors ▶ 47-4021-Elevator and Escalator Installers and Repairers ▶ 47-4031-Fence Erectors ▶ 47-4041-Hazardous Materials Removal Workers	High School Diploma	Construction and building inspectors ensure that construction meets building codes and ordinances, zoning regulations, and contract specifications.	Construction and building inspectors may advance to become a plans examiner or building official. Advancement opportunities may require additional education, along with experience as a construction or building inspector.	▶ communicate findings orally and through writing ▶ detail oriented ▶ knowledge of mechanical system operation ▶ maneuver in tight spaces ▶ physical endurance
49-3030	Bus and Truck Mechanics and Diesel Engine Specialists	▶ 49-3031 - Bus and Truck Mechanics and Diesel Engine Specialists	High School Diploma	Diesel service technicians and mechanics inspect, repair, and overhaul buses, trucks, or any vehicle with a diesel engine.	Although not required, this certification demonstrates a diesel technician's competence and experience to potential employers and clients, and often brings higher pay.	▶ customer service ▶ detail oriented ▶ understanding of engine components and systems ▶ maintain a clean workspace ▶ lift heavy equipment ▶ use diagnostic equipment to identify and fix mechanical and electronic equipment ▶ operate tools to fix electronic control systems

SOC Code	Occupation	Relevant Jobs	Minimum Education	Job Description	Career Advancement Licenses and Certifications	Skills Required
49-3040	Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics	▶ 49-3041-Farm Equipment Mechanics and Service Technicians ▶ 49-3042-Mobile Heavy Equipment Mechanics, Except Engines ▶ 49-3043-Rail Car Repairers ▶ 49-3053-Outdoor Power Equipment and Other Small Engine Mechanics ▶ 49-3091-Bicycle Repairers ▶ 49-3092-Recreational Vehicle Service Technicians ▶ 49-3093-Tire Repairers and Changers	High School Diploma	Heavy vehicle and mobile equipment service technicians inspect, maintain, and repair vehicles and machinery used in construction, farming, and other industries.	Some manufacturers offer certification in specific repair methods or equipment. Although not required, certification can demonstrate a service technician’s competence and usually commands higher pay.	disassemble engine parts connect or attach components operate hand tools steady hands familiarity with engine components and systems maintain accurate service records and parts inventories lift heavy equipment familiarity with diagnostic equipment
49-9020	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	▶ 49-9021-Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Postsecondary Education	Heating, air conditioning, and refrigeration mechanics and installers work on heating, ventilation, cooling, and refrigeration systems.	Manufacturer or industry certification is available for HVAC technicians. Many certifications are optional, although some employers prefer or require specific types.	▶ customer service ▶ maintain accurate work logs ▶ calculate load requirements ▶ understand HVACR components and systems ▶ maneuver in tight spaces ▶ physical endurance ▶ lift heavy equipment and components ▶ problem solve ▶ comprehension of computerized components and networking features
49-9040	Industrial Machinery Installation, Repair, and Maintenance Workers	▶ 49-9041-Industrial Machinery Mechanics ▶ 49-9043-Maintenance Workers, Machinery ▶ 49-9044-Millwrights ▶ 49-9045-Refractory Materials Repairers, Except Brickmasons	High School Diploma	Industrial machinery mechanics and machinery maintenance workers maintain and repair factory equipment and other industrial machinery. Millwrights install, dismantle, repair, reassemble, and move machiner.	Industrial machinery mechanics and machinery maintenance workers typically receive more than a year of on-the-job training. Most millwrights learn their trade through a three- or four-year apprenticeship.	▶ steady hand ▶ good hand-eye coordination ▶ comprehend technical manuals and equipment ▶ reassemble complex machines ▶ strong observation and diagnostic skills
49-9050	Line Installers and Repairers	▶ 49-9051-Electrical Power-Line Installers and Repairers ▶ 49-9052-Telecommunications Line Installers and Repairers ▶ 49-9069-Precision Instrument and Equipment Repairers, All Other	High School Diploma	Electrical power-line installers and repairers install or repair cables or wires used in electrical power or distribution systems.	After three or four years of working, qualified electrical power-line apprentices reach the journey level. A journey-level worker is no longer considered an apprentice and can perform most tasks without supervision. Experienced electrical power-line installers and repairers may become supervisors or trainers.	▶ working at heights ▶ distinguish color ▶ collaborate with team members ▶ physical endurance ▶ lift heavy tools and equipment ▶ diagnose problems in electrical systems ▶ perform repairs ▶ use diagnostic equipment ▶ be familiar with electrical systems and relevant tools
49-9070	Maintenance and Repair Workers, General	▶ 49-9071 - Maintenance and Repair Workers, General ▶ 49-9031-Home Appliance Repairers	High School Diploma	General maintenance and repair workers fix and maintain machines, mechanical equipment, and buildings.	Some maintenance and repair workers decide to train in one specific craft and become craftworkers. Other maintenance workers eventually open their own repair or contracting business. However, those who want to become a project manager or own their own business may need some postsecondary education or a degree in construction management. Within small organizations, promotion opportunities may be limited.	▶ customer service ▶ steady hands ▶ complete repairs using hand tools ▶ perform tests and diagnose problems

SOC Code	Occupation	Relevant Jobs	Minimum Education	Job Description	Career Advancement Licenses and Certifications	Skills Required
49-9080	Wind Turbine Service Technicians	▶ 49-9081-Wind Turbine Service Technicians	Postsecondary Education	Wind turbine service technicians maintain and repair wind turbines.	Although not mandatory, professional certification allows workers to demonstrate a certain level of knowledge and competence. Certification subjects for wind technicians include workplace electrical safety, tower climbing, and self-rescue. Employers often direct workers to the certifications they need.	▶ working at heights ▶ communicate with specialists ▶ maintain records of services ▶ follow precise protocols ▶ understand turbine technical systems ▶ physical endurance ▶ lift heavy equipment and tools ▶ diagnose problems ▶ problem solve
51-4120	Welding, Soldering, and Brazing Workers	▶ 51-4121-Welders, Cutters, Solderers, and Brazers ▶ 51-4122-Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	High School Diploma	Welders, cutters, solderers, and brazers use hand-held or remotely controlled equipment to join, repair, or cut metal parts and products.	Although some employers hire inexperienced entry-level workers and train them on the job, many prefer to hire workers who have completed training or credentialing programs. Some employers require general or specific certification for particular jobs. They may pay the cost of training and testing for employees.	▶ precision with equipment ▶ attention to detail ▶ steady hands ▶ physical endurance ▶ lift heavy equipment ▶ read and interpret diagrams
53-3050	Passenger Vehicle Drivers	▶ 53-3051-Bus Drivers, School ▶ 53-3052-Bus Drivers, Transit and Intercity	High School Diploma	Bus drivers transport people between various places—including school, work, and shopping centers—and across state and national borders.	Bus drivers must have a commercial driver’s license (CDL), which they sometimes earn during on-the-job training. They also need a good driving record and must meet physical, hearing, and vision requirements. Federal regulations require interstate bus drivers to pass a physical exam every 2 years and to submit to random drug or alcohol testing.	▶ customer service ▶ consistent timing ▶ hand-eye coordination ▶ good hearing ability ▶ patience ▶ good physical health ▶ non-impaired vision
53-4000	Rail Transportation Workers	▶ 53-4099-Rail Transportation Workers, All Other ▶ 49-9097-Signal and Track Switch Repairers	High School Diploma	Railroad workers ensure that passenger and freight trains run on time and travel safely. Some workers drive trains, some coordinate the activities of the trains, and others operate signals and switches in the rail yard.	Locomotive engineers typically receive three or more months of on-the-job training before they can operate a train on their own. Locomotive engineers and conductors must be certified by the Federal Railroad Administration. Conductors who operate on national, regional, or commuter railroads are also required to become certified.	▶ communication skills ▶ customer service ▶ hand-eye coordination ▶ good hearing ability ▶ ability to oversee others ▶ adjust equipment and conduct mechanical inspections ▶ lift heavy equipment ▶ non-impaired vision

Source: U.S. Bureau of Labor Statistics 2025b; adapted by Ascent 2025.

Workforce development will involve training and educational programs that provide the resources for residents to succeed at high-road jobs. Many programs exist through community colleges, unions, and institutions, an overview of which are provided in Table 23. Some programs are intended to assist residents in completing general educational requirements, and others are occupation-specific with the goal of a certification and/or apprenticeship. Hands-on experience via an apprenticeship and direct pathways to immediate hiring opportunities following the completion of a program are crucial to ensuring trained individuals see immediate returns on their investment. Partnerships between training programs facilitators and corporations and public departments are the best way to connect highly qualified individuals with newly created jobs.

Table 12 Job Training Providers and Programs

Training and Education Providers	Program, Degree, or Certification Offered
Air Conditioning Sheet Metal Association	▶ Kern & Northern Los Angeles Counties Air Conditioning and Sheet Metal Workers' Apprenticeship & Training Center
Bakersfield Adult School	▶ High School Diploma ▶ General Educational Development (GED) ▶ English as a Second Language (ESL) ▶ Job Training - Information Technology Specialist
Bakersfield College (BC)	BC offers two Baccalaureate Programs: ▶ Industrial Automation ▶ Research Laboratory Technology BC also has over 300 degree, certificate, and apprenticeship programs, including: ▶ Regenerative Agriculture ▶ Energy: Modern Energy Certificate of Completion ▶ Health Sciences ▶ Industrial Technology and Transportation Pathway: Architecture, Automotive Technology, Construction, Electronics, Engineering Technology, HVAC Technology, Industrial Automation, Industrial Drawing & Drafting, Industrial Technology, Manufacturing Technologies, Occupational Safety & Risk Management, Welding, Woodworking & Cabinetmaking ▶ STEM: Astronomy, Biology, Chemistry, Computer Science, Engineering, Environmental Science, Geology, Information Technology, Mathematics, Modern Energy, Physics, & Research Laboratory Technology
Bakersfield Sheet Metal Workers Apprenticeship & Training Center	Apprenticeship with the certifications in the following: ▶ Air Conditioning Service ▶ Industrial Welding ▶ CAD (Computer-Aided Design) ▶ Stainless Steel Kitchen Equipment Installation ▶ Sheet Metal Roof Installation ▶ HVAC Fire/Life-Safety
California State University Bakersfield (CSUB) – Center for Entrepreneurship & Innovation (CEI)	CEI assists students secure internships in the following industries: ▶ Petroleum and Renewable Energy ▶ Aerospace ▶ Remote Business Services ▶ Advanced Manufacturing ▶ Agricultural Technology CEI runs the following programs: ▶ Venture Accelerator Program

Training and Education Providers	Program, Degree, or Certification Offered
	▶ Aerospace Innovation Program ▶ Entrepreneurship Passport Continuing Education Program ▶ Engineering
Cerro Coso Community College	Cerro Coso offers a wide variety of educational opportunities for students looking for career training or workforce development, in addition to providing numerous courses to help citizens enhance job skills and career development. Specialized jobs/skills include: ▶ Industrial Process Technician ▶ Welding Technology ▶ Commercial Truck Driving ▶ Passenger and School Bus Endorsement ▶ Forklift Certification
Delano Adult School	▶ Academic Transition (pre-HiSET/GED) ▶ High School Diploma ▶ High School Equivalency ▶ ESL ▶ El Civics
Employment Training Panel (ETP)	Offers a variety of employment training opportunities (electricity, HVAC, construction, etc.). Employment Training Panel is a flexible source for performance-based state funding to support incumbent worker upskilling and to reimburse for a wide array of entry-level new hire training across multiple industries.
Farmworker Institute of Education and Leadership Development (FIELD)	▶ High School Diploma ▶ ESL ▶ Literacy ▶ Solar ▶ Recycling ▶ Natural Resources ▶ Agriculture ▶ Cesar Chavez Conservation Corp
International Brotherhood of Electrical Workers - IBEW 428	▶ Inside Wiremen ▶ Outside Wiremen ▶ Resident Wiremen ▶ Telecommunications Installer Technicians
Ironworkers, Local 155	▶ Structural Steel ▶ Architectural Steel ▶ Rigging ▶ Welding ▶ Reinforcing Steel
Kern Community College District (Kern CCD) - California Renewable Energy Lab (CREL)	CREL has the following four Centers of Excellence for enrolled students: ▶ CRC Carbon Management Institute ▶ Clean Energy & Grid Resilience ▶ Advanced Transportation ▶ High Performance Buildings

Training and Education Providers	Program, Degree, or Certification Offered
Kern Community College District - 21 st Century Energy Center	The 21st Century Energy Center offers the following programs: ▶ Basic construction training ▶ EV charger installation pre-apprenticeship training ▶ Solar installation training ▶ Basic electrical concepts and safety for non-electricians ▶ Utility line clearance arborist training ▶ Utility vegetation management pre-inspector
Kern County Regional Occupational Center	Vocational training in: ▶ Construction trades ▶ Livestock management ▶ Metal fabrication ▶ Welding
Kern County Employers' Training Resource	▶ Multi-Craft Pre-Apprenticeship Training Vocational Training Programs (core construction, welding, etc.)
Kern Literacy Council	▶ Adult and child basic education ▶ ESL ▶ Citizenship Test preparation ▶ GED preparation ▶ Free community tutoring ▶ Dolly Parton Imagination Library
Laborers' International Union of North America - LIUNA, Local 220	▶ Environmental remediation ▶ Building construction ▶ Heavy/Highway construction
Laborers Training and Retraining Fund	▶ Laborers Training School
Local 460	▶ Pipe Trades Apprenticeship Training and Educational Committee Program
Operating Engineers Local 12	▶ Operating Engineer Apprenticeship
Painters District Council 36	▶ Training Programs (commercial paint, drywall, etc.)
Plumbers and Steam Fitters JATC	Apprenticeships in the following: ▶ Plumbing ▶ Pipefitting ▶ HVAC
Proteus Inc.	▶ General Office Occupations ▶ Truck Driving ▶ Energy Careers ▶ Forklift Certification ▶ ESL ▶ Citizenship ▶ High School Equivalency
San Joaquin Valley College	▶ Electrical Technology ▶ HVAC ▶ Maintenance Technician

Training and Education Providers	Program, Degree, or Certification Offered
SeedCore Foundation - Kern Initiative for Talent and Entrepreneurship	Assists high school graduates attending university to pursue careers in: ▶ Agriculture ▶ Oil/gas ▶ Renewable energy ▶ Aerospace technology
Teamsters Local 87	▶ Construction training programs
The Kern County Electrical Joint Apprenticeship and Training Committee (JACT)	▶ Electrical apprenticeship
UEI College Bakersfield	Career training programs for: ▶ Electrician technician ▶ HVAC technician ▶ Welding
Valley Build	Multi-craft core curriculum (MC3) pre-apprenticeship training for construction careers such as: ▶ Bricklayers ▶ Iron workers ▶ Electricians ▶ Plumbers/pipefitters ▶ Operating engineers
Wasco Adult Education Program	▶ High School Diploma ▶ ESL ▶ Citizenship Classes ▶ Computer Classes
West Kern Adult Education Network	▶ Welders Helper ▶ Industrial Safety ▶ Forklift ▶ Paraprofessional ▶ Construction ▶ ESL ▶ GED

Notes: CREL = California Renewable Energy Lab; CEI = Center for Entrepreneurship & Innovation; CSUB = California State University Bakersfield; ESL = English as a Second Language; CAD = Computer-Aided Design; GED = General Educational Development; HiSET = High School Equivalency Test; HVAC = Heating, Ventilation, and Air Conditioning; IBEW = International Brotherhood of Electrical Workers; JACT = Joint Apprenticeship and Training Council; Kern CCD = Kern Community College District; LIUNA = Laborers' International Union of North America

Source: Kern County 2024: Appendix A 115.

Many programs exist that provide training and resources for residents to gain workforce skills, however programs are often competitive and may require payment. Collaboration between employers and university training assistance programs is another way to employ residents who may lack technical skills initially, but develop skills through a work-sponsored program. Equally important is the adequate staffing of teachers with industry experience to be passed down to students. Kern County Superintendent of Schools (KCSOS) is developing a California Career Technical Education (CTE) credential program to provide resources for professionals to obtain their teaching credentials, without having to enroll in programs outside of the county (KCSOS 2025).

6.2 SOCIOECONOMIC BARRIERS

Some of the demographics described earlier in this report reveal socioeconomic barriers that prevent residents from obtaining high quality employment, such as language comprehension and educational attainment. There are additional factors that affect an individual's ability to qualify for and maintain employment, including access to transportation and housing affordability. As SOAR Bakersfield will result in the creation of numerous jobs anticipated to boost the Kern County workforce, the City must adequately understand the obstacles that may prevent residents from job opportunities. An assessment of barriers to employment is provided below, which was developed based on a review of previous analyses and direct engagement with leaders from community-based organizations (CBOs).

- ▶ **Language:** Many occupations require English proficiency as a criterion for job qualification. With approximately 30% of Kern County Spanish speakers responding that they have difficulty with English, job opportunities are more limited for them. If residents struggle with English, they are more likely to work in jobs with limited career mobility and compensation, as higher quality jobs are occupied by those with the necessary language proficiency. Leaders of CBOs also voiced concerns regarding lack of culturally sensitive recruitment and prevalent hiring bias, related to language in addition to gender and race.
- ▶ **Income:** Financial capital can determine people's access to workforce development opportunities. Individuals that must allocate more of their time to work in order to pay for basic needs may not have the capacity to participate in training programs or identify employment assistance. Community members expressed the need for greater promotion and provision of career advisory services and training programs, in addition to strategically locating these resources near disadvantaged communities. Improving resource access in terms of physical location and hours of operation can help address barriers such as access to technology; in Kern County, 80.6% of households have access to internet and 88.4% of households have access to a computer (City of Bakersfield 2021: 5-4).
- ▶ **Income:** Financial capital can determine people's access to workforce development opportunities. Individuals that must allocate more of their time to work in order to pay for basic needs may not have the capacity to participate in training programs or identify employment assistance. Community members expressed the need for greater promotion and provision of career advisory services and training programs, in addition to strategically locating these resources near disadvantaged communities. Improving resource access in terms of physical location and hours of operation can help address barriers such as access to technology; in Kern County, 80.6% of households have access to internet and 88.4% of households have access to a computer (City of Bakersfield 2021: 5-4).
- ▶ **Formerly Incarcerated Status:** Individuals that were formerly incarcerated have limited resources to assist in their integration into the workforce. Employers may avoid hiring individuals with a criminal record, and the jobs available to formerly incarcerated people are often low-paying with little room for career growth. Based on national statistics, 33% of people released from prison did not secure a job in the four years following their release (Wang and Bertram 2022). Leaders of CBOs expressed the need for access to job training resources for incarcerated persons before and immediately after release to most effectively leverage the availability of interim housing. Implementing workforce assistance programs for occupants of North Kern State Prison may be one way to prevent individuals living in poverty post-release.
- ▶ **Transportation Access:** Kern County encompasses a large region, which often requires residents to commute to their place of work. Currently, 79.8% of Kern County residents drive alone as their form of commute (City of Bakersfield 2021: 4-7). Ownership of a personal vehicle can be costly when accounting for maintenance and the frequency of gas purchases. In addition, commuters must account for traffic thus impacting their ability to reach work destinations. Although cars are the primary mode of transport in the county, the Kern County Regional Strategies High Road Training Partnership Survey found that 73% of respondents expressed interest in greater public investment in public transportation (Kern County 2024: 75). Leaders of CBOs expressed the need for greater access to transportation, citing lack of financial support and geography as barriers.
- ▶ **Housing Affordability:** Housing insecurity in Kern County is due to the combination of expensive housing costs and low wages. In Kern County, those who are most economically vulnerable must dedicate a majority of their income to housing; 80% of extremely low-income households (0-30% of area median income) and 55% very low-

income households (30 – 50% of area median income) pay more than half their income on housing costs, compared to 1% of moderate-income households (California Housing Partnership 2025). Residents that must allocate large proportions of their time and resources just to pay rent may not have the ability to seek opportunities for career growth, such as training programs or further educational attainment. In addition to housing cost burdened residents, the county experienced a 143% increase in homelessness between 2018-2022 owing to a combination of housing costs, lack of mental health resources, and drug addiction (Kern County 2024: 93–94).

- **Childcare:** Childcare is considered a basic need that should be affordable under a living wage. Unfortunately, childcare is not often provided by employers and requires parents to allocate resources to private facilities. A study of sustainable living wages found that in the year 2023 for a two parent two child family, if one parent were to work they would need to earn an hourly wage of \$38.14 to avoid housing and food insecurity, and if both parents were to work each would have to earn an hourly wage of \$25.02 (Kern County 2024: 107). Also considering the high prevalence of single-parent households (City of Bakersfield: 5-17), there is limited opportunities for parents to seek high-road jobs.

6.3 HIGH-ROAD JOBS AND WAGE DISPARITY

As discussed in Section 3.1, the majority of new jobs created in Kern County have low wages with little opportunity for career progression. This is due to the growth in sectors like agriculture and warehousing, which provide economic profit to the region, but have some of the lowest quality and unsafe jobs. Development of high-road jobs in these industries can include greater job opportunities in manufacturing and management (B3K Prosperity 2021: 53) as opposed to entry-level production and laborer positions. However, additional high-road jobs will need to be created in areas outside of agriculture and warehousing, as there is limited need for additional skilled, technical positions in these industries. Based on an assessment of the number of workers that do not meet self-sufficiency needs, an additional 99,500 quality jobs are needed by 2029 (B3K Prosperity 2021: 52). For residents to benefit from the creation of high-road jobs, like those required to complete SOAR Bakersfield projects, greater access to training and educational programs is necessary. Investment in the infrastructure that supports the workforce, such as transportation and housing, will also be crucial to ensure residents have the time and money to engage with programs that provide skill development.

6.4 SUMMARY OF OPPORTUNITIES AND CHALLENGES

There are many existing training, education, and apprenticeship programs that focus on occupations that are critical to SOAR Bakersfield’s implementation, providing opportunities for Kern County residents to secure employment in growing economic sectors with livable wages and benefits. However, there are socioeconomic barriers for many in Bakersfield and Kern County that create challenges for accessing these programs. As part of the SOAR Bakersfield community engagement process, stakeholders had voiced that although there are resources available for adult education, job seeking/preparation, English proficiency, and tuition/enrollment fee subsidies, a critical challenge is accessibility of information about these programs and a general lack of trust in government sponsored programs.

Many of the jobs needed offer pathways to high-road jobs, have relatively low requirements for entry, and existing training programs provide opportunity to gain the skills needed. For example, programs offered through Kern CCD include EV charger training, solar installation training, and basic electrical concepts for non-electricians. Furthermore, UEI College Bakersfield offer career training for electrician technicians, HVAC technicians, and welding. Each of these occupations are expected to be in high demand in the future, and the existing educational framework can support the creation of a local workforce. However, additional analysis may be needed to understand if the capacity and graduation rates of these programs is sufficient to meet projected workforce needs in key occupations.

Engineering occupations that require a bachelor degree level of education are high-paying, but require significant costs and time commitment that may be difficult for people facing socioeconomic challenges. California State University, Bakersfield (CSUB) offers engineering degree programs and has issued over 600 engineering degrees

since the program began in 2012 (California State University, Bakersfield 2024). However, a substantial increase in the number of degrees offered over the next decade would be needed to fulfill the approximately 2,700 job openings between 2022 and 2032 in engineering fields with Kern County residents.

Overall, there are numerous organizations, educational institutions, and labor unions that support the growth of a local workforce in growing economic sectors, and sufficient population to support this workforce. However, overcoming socioeconomic barriers for residents to access high-wage job opportunities is expected to be an ongoing challenge for the region.

7 WORKFORCE DEVELOPMENT STRATEGY

The following section outlines recommended strategies the City of Bakersfield can implement to support the growth of a local workforce that can fill the demands from SOAR Bakersfield and the transitions that are expected to occur as a result of California's strategies for reducing climate pollution. These strategies would be further defined and implemented in partnership with various education institutions, community-based organizations, and labor unions. Kern CCD/CREL has been identified as an early partner in the development and implementation of these strategies.

7.1 STRATEGIES

7.1.1 Strategy 1 - Update the City's Procurement and Hiring Policies to Prioritize the Local Workforce

Prioritizing employment of the local workforce for municipal projects can ensure a percentage of new jobs created by City-led SOAR Bakersfield will be secured for residents. Requirements for local labor minimums can be achieved in a few ways, including establishing a threshold for bid amounts that trigger a policy, and identifying a percent number of jobs that must be designated for residents. A number of other cities have used this strategy to increase the employment of residents, including San Francisco and Los Angeles. Based on the population size of Bakersfield, the number of disadvantaged residents, and estimated funds required to implement SOAR Bakersfield, the following strategies could be considered:

- ▶ Project bids over \$1 million require contractors to make a good faith effort to ensure 30% of employment is allocated to Kern County residents and increase this proportion to 50% by 2030.
- ▶ Of the locally employed workforce, 10% must qualify as disadvantaged.
- ▶ Contractors must sponsor at least 1% of their workforce for training or completion of an apprenticeship. This can take the form of a partnership with a local university, private corporation, or be completed in-house.
- ▶ The City may choose to enact a penalty for contractors that fail to meet an established threshold of local employment.
- ▶ The City may also provide incentives for contractors that employ local labor that is beyond an established threshold.

Note that thresholds and targets identified here are for demonstration purposes, and appropriate values would be determined with additional stakeholder engagement and analysis.

7.1.2 Strategy 2 - Expand Education and Certification Opportunities for Occupations with Growing Demand

Kern County has several colleges and education institutions that can serve an important role in preparing the workforce for newly created high-road jobs. For those with existing training programs and robust degree selection, there should be emphasis on program expansion and establishing secondary degree opportunities. Colleges that do not currently offer green energy, high-road job training or certification programs should look to partner with organizations that take part in efforts like the Transformative Climate Communities Initiative and Kern High Road Coalition. Listed below are a few considerations:

- ▶ Work with CSUB to expand post-secondary degree opportunities to engineering, product manufacturing, and environmental remediation.
- ▶ Support the expansion of CSUB sustainable entrepreneurship training and the introduction of job skills training workshops in sustainable technologies.
- ▶ Partner with Kern CCD to expand enrollment and offerings in the CREL and 21st Century Energy Center.
- ▶ Expand CTE in Kern High School District and collaborate with universities to create similar training programs for professionals.
- ▶ Partner with schools like North West College and Taft College to develop green energy career certification programs and/or related degrees.
- ▶ Assist adult schools to create trade-related (electrician, plumber, etc.) certification programs to increase student awareness/interest in high-road careers immediately after completion of a GED/high school degree.
- ▶ Expand degree and training programs for formerly incarcerated people, like CSUB's Project Rebound.

7.1.3 Strategy 3 - Partner with Community-Based Organization to Improve Accessibility to High-Road Jobs

Community-based organizations (CBOs) often provide on-the-ground resources for community members and help to bridge gaps in public and private services. These organizations are often trusted entities as they are highly involved with the public and understand the needs of the community. Forming partnerships with CBOs can help the City reach audiences that may be left out of more formal processes and ensure City resources are allocated effectively to the people that need them most. Strategies below describe how CBO partnerships can aid in workforce development:

- ▶ Establish partnerships with CBOs to increase access to workforce training and opportunity programs for underserved groups through funding and/or program application assistance.
 - CBOs may include: Garden Pathways, Habitat for Humanity, CAPK, and Dolores Huerta Foundation.
 - Programs include: ESL and GED programs, citizenship test preparation, and short-term certification programs.
- ▶ Conduct direct outreach in partnership with CBOs to low-income and historically underserved communities to assist in securing employment opportunities that provide on-the-job training and apprenticeships.
- ▶ Collaborate with CBOs with green energy job programs to ensure people enrolled in the program have adequate access to transportation, technology, etc.

7.1.4 Strategy 4 - Create Additional On-the-Job Training and Apprenticeship Opportunities

Many occupations require training or work experience as a qualification; this can serve as a barrier for many people due to the competitiveness of apprenticeship programs, the time and monetary commitment to complete training programs, and capacity of workplaces to provide training to employees. The City can collaborate with colleges and unions to create more opportunities for residents to receive the qualifications necessary to occupy high-road jobs. Some colleges also offer training programs to assist employers with onboarding employees. The following strategies are examples for expanding access to training and apprenticeships:

- ▶ Partner with trade unions and educational institutions to increase on-the-job training opportunities for participants while they are still enrolled in certification/education programs.
- ▶ Contact unions that do not currently possess apprenticeships to help establish programs and propose on-the-job training for apprentices on SOAR Bakersfield projects.
- ▶ Work with employers to ensure they provide comprehensive, holistic, and flexible benefits designed to address employees' personal and systemic barriers to work (e.g. wraparound services) for employees that will complete training.

7.1.5 Strategy 5 - Address Housing Affordability by Implementing the Housing Element

The City of Bakersfield 2023-2031 Draft Housing Element Update (HE Update) is an essential planning document that guides the development of future housing and preservation of existing housing in the city. The HE Update also includes strategies to address housing affordability. These strategies are intended to reduce the number of housing-burdened residents and increase housing in areas close to residents' place of work. The construction of more affordable housing will also support the future workforce population expected to occupy jobs within Kern County. Notable strategies in the HE Update are:

- ▶ Update land use designations in the General Plan to be consistent with the Zoning Code, allowing for a greater mix of housing types and more multifamily housing (pg.C-3).
- ▶ Review existing Zoning Code development standards and overlay zones to accommodate for increased residential housing density and transit-oriented development (pg.C-6).
- ▶ Provide density bonuses for development that have a certain number of units reserved for affordable to moderate, low, and very low-income households. California Assembly Bill 1287 requires additional density bonuses (pg.C-24).
- ▶ Eliminate or reduce housing development parking minimums to make multifamily and affordable housing more financially accessible (pg. C-28).
- ▶ Add zones to Zoning Code to allow for more Low Barrier Navigation Centers, shelters for people experiencing homelessness that offer services and support to connect them to permanent housing and other resources.

7.1.6 Strategy 6 -Support Retraining for Carbon Capture and Storage and Renewable Energy Projects

Kern County has been identified as a region with high potential for leadership in the carbon capture technology industry. Energy companies already present in the area have started to invest in these technologies, and skills of the oil and gas industry workforce are largely transferable to these jobs (B3K Prosperity 2021: 35–36). Resources to aid the transition of oil and gas workers will be important for job stability and facilitating support for green energy jobs. Funding sources like the Displaced Oil and Gas Worker Fund Grant, offered by Kern County’s Employers’ Training Resource, will also be important to support worker transitions.

- ▶ Support the development of clean energy training programs at colleges and more opportunities for apprenticeships and certifications relevant to environmental industries.
- ▶ Provide grant funding or increase residential awareness of funding for programs that assist employees transitioning to different careers.

7.2 MONITORING WORKFORCE STRATEGIES

Measuring the success of workforce strategy implementation helps the City assess where best to allocate resources and how to adapt its approach based on implementation successes and additional community engagement. In order to effectively monitor the success of workforce strategies, the City will need to create partnerships with educational and labor institutions that allow for data collection over time. The following list identifies metrics to measure success, which will need to be better defined as implementation of strategies begins. A set of “Cross-cutting” metrics has been defined that can be incorporated into the tracking for individual strategies if systems for collecting data can be established.

7.2.1 Strategy 1 - Update the City’s Procurement and Hiring Policies to Prioritize the Local Workforce

Procurement Rates: the total number of workers under contracts for municipal projects that are Kern County residents.

Awarded Projects: percent of City projects that are awarded to contractors that meet established threshold(s) for participation from Kern County residents.

7.2.2 Strategy 2 - Expand Education and Certification Opportunities for Occupations with Growing Demand

Educational Attainment: the number of people that graduate with a GED or high school diploma from adult colleges and other programs.

Expand Institutional Offerings: number of new degree or certification programs established.

7.2.3 Strategy 3 - Partner with Community-Based Organizations to Improve Accessibility to High-Road Jobs

Outreach Events Hosted: the number of informational events hosted and/or the number of attendees.

Individual Assistance: number of people assisted via collaborative efforts between the City and CBOs (i.e., scholarships awarded, applications submitted, etc.).

7.2.4 Strategy 4 - On-the-Job Training and Apprenticeship Opportunities

Job Placement Rate: the number of graduates from job training and certificate programs that secure employment within six months of completion.

Employment Retention: percent of training program graduates that remain at the place of employment one year following initial employment.

7.2.5 Strategy 5 - Address Housing Affordability by Implementing the Housing Element

Constructed Units: the number of affordable housing units constructed.

Transition of Zoning: total area that has been rezoned to allow for high-density, multifamily, transit-oriented development, and Low Barrier Navigation Centers.

7.2.6 Strategy 6 -Support Retraining for Carbon Capture and Storage and Renewable Energy

Community Interest Level in Programs: the number of applicants to clean energy-related degrees, training programs, certification programs, and apprenticeships previously employed in oil and gas industries.

7.2.7 Cross-Cutting Metrics

Allocation for Training and Educational Programs: measure the amount of funds allocated to training and educational programs, and the number of positions available in these programs.

Completion Rates: the number of participants completing training and certification programs and finishing apprenticeships.

High-road Jobs: the number of participants securing jobs above the average living wage level, with health care benefits across various occupations.

Salary Increases: the average salary of participants before and after completion of various education, training, and apprenticeship programs.

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Attachment A

Employment Projections for Relevant
Occupations, 2022 to 2032

2022-2032 Occupational Employment Projections Bakersfield Metropolitan Statistical Area (Kern County)														
SOC Level ^[1]	SOC Code ^[2]	Occupational Title ^[3]	Base Year Employment Estimate 2022 ^{[4][5]}	Projected Year Employment Estimate 2032	Numeric Change 2022-2032 ^[6]	Percent-age Change 2022-2032	Exits ^[7]	Transfers ^[8]	Total Job Openings ^[9]	Median Hourly Wages ^[10]	Median Annual Wages ^[10]	Entry Level Education ^{[11][12]}	Work Experience ^{[11][12]}	On-the-Job Training ^{[11][12]}
4	11-9021	Construction Managers	1,180	1,320	140	11.9%	310	570	1,020	\$55.59	\$115,624	Bachelor's degree	None	Moderate-term on-the-job training
4	11-9041	Architectural and Engineering Managers	360	410	50	13.9%	80	160	290	\$81.99	\$170,538	Bachelor's degree	5 years or more	None
4	11-9121	Natural Sciences Managers	50	50	0	0.0%	10	20	30	\$80.33	\$167,065	Bachelor's degree	5 years or more	None
4	13-1151	Training and Development Specialists	740	830	90	12.2%	240	410	740	\$30.20	\$62,801	Bachelor's degree	Less than 5 years	None
4	13-1199	Business Operations Specialists, All Other	3,190	3,380	190	6.0%	1,090	1,700	2,980	\$39.87	\$82,928	Bachelor's degree	None	None
4	17-1011	Architects, Except Landscape and Naval	120	150	30	25.0%	40	40	110	\$50.23	\$104,494	Bachelor's degree	None	Internship/residency
4	17-1022	Surveyors	110	120	10	9.1%	40	40	90	\$41.25	\$85,796	Bachelor's degree	None	Internship/residency
4	17-2051	Civil Engineers	620	710	90	14.5%	140	250	480	\$47.25	\$98,261	Bachelor's degree	None	None
4	17-2061	Computer Hardware Engineers	230	250	20	8.7%	50	80	150	\$62.74	\$130,496	Bachelor's degree	None	None
4	17-2071	Electrical Engineers	490	530	40	8.2%	120	150	310	\$56.59	\$117,701	Bachelor's degree	None	None
4	17-2072	Electronics Engineers, Except Computer	620	680	60	9.7%	150	190	400	\$56.43	\$117,382	Bachelor's degree	None	None
4	17-2081	Environmental Engineers	60	70	10	16.7%	20	20	50	\$55.06	\$114,538	Bachelor's degree	None	None
4	17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	50	60	10	20.0%	10	20	40	\$59.43	\$123,625	Bachelor's degree	None	None
4	17-2112	Industrial Engineers	310	370	60	19.4%	80	100	240	\$52.96	\$110,170	Bachelor's degree	None	None
4	17-2131	Materials Engineers	50	60	10	20.0%	20	20	50	\$58.79	\$122,296	Bachelor's degree	None	None
4	17-2141	Mechanical Engineers	620	710	90	14.5%	150	210	450	\$54.24	\$112,818	Bachelor's degree	None	None
4	17-2171	Petroleum Engineers	570	560	-10	-1.8%	110	200	300	\$67.04	\$139,438	Bachelor's degree	None	None
4	17-2199	Engineers, All Other	740	780	40	5.4%	180	250	470	\$66.02	\$137,316	Bachelor's degree	None	None
4	37-3011	Landscaping and Groundskeeping Workers	2,250	2,740	490	21.8%	1,240	1,940	3,670	\$18.46	\$38,387	No formal educational credential	None	Short-term on-the-job training
4	37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	200	200	0	0.0%	70	190	260	\$19.40	\$40,356	High school diploma or equivalent	None	Moderate-term on-the-job training

2022-2032 Occupational Employment Projections Bakersfield Metropolitan Statistical Area (Kern County)														
SOC Level ^[1]	SOC Code ^[2]	Occupational Title ^[3]	Base Year Employment Estimate 2022 ^{[4][5]}	Projected Year Employment Estimate 2032	Numeric Change 2022-2032 ^[6]	Percent-age Change 2022-2032	Exits ^[7]	Transfers ^[8]	Total Job Openings ^[9]	Median Hourly Wages ^[10]	Median Annual Wages ^[10]	Entry Level Education ^{[11][12]}	Work Experience ^{[11][12]}	On-the-Job Training ^{[11][12]}
4	47-2051	Cement Masons and Concrete Finishers	600	660	60	10.0%	160	310	530	\$28.66	\$59,612	No formal educational credential	None	Moderate-term on-the-job training
4	47-2061	Construction Laborers	2,670	3,100	430	16.1%	1,000	1,460	2,890	\$23.54	\$48,962	No formal educational credential	None	Short-term on-the-job training
4	47-2073	Operating Engineers and Other Construction Equipment Operators	1,070	1,210	140	13.1%	380	570	1,090	\$31.18	\$64,855	High school diploma or equivalent	None	Moderate-term on-the-job training
4	47-2081	Drywall and Ceiling Tile Installers	680	770	90	13.2%	170	300	560	\$29.52	\$61,398	No formal educational credential	None	Moderate-term on-the-job training
4	47-2111	Electricians	1,330	1,470	140	10.5%	470	750	1,360	\$35.91	\$74,695	High school diploma or equivalent	None	Apprenticeship
4	47-2141	Painters, Construction and Maintenance	690	760	70	10.1%	250	310	630	\$25.14	\$52,297	No formal educational credential	None	Moderate-term on-the-job training
4	47-2151	Pipelayers	50	50	0	0.0%	10	30	40	\$36.07	\$75,013	No formal educational credential	None	Short-term on-the-job training
4	47-2152	Plumbers, Pipefitters, and Steamfitters	880	960	80	9.1%	290	490	860	\$29.04	\$60,392	High school diploma or equivalent	None	Apprenticeship
4	47-2161	Plasterers and Stucco Masons	140	160	20	14.3%	50	60	130	\$29.01	\$60,331	No formal educational credential	None	Long-term on-the-job training
4	47-2181	Roofers	230	270	40	17.4%	70	120	230	\$28.87	\$60,054	No formal educational credential	None	Moderate-term on-the-job training
4	47-2211	Sheet Metal Workers	150	160	10	6.7%	60	80	150	\$43.64	\$90,763	High school diploma or equivalent	None	Apprenticeship
4	47-2231	Solar Photovoltaic Installers	280	410	130	46.4%	70	230	430	\$23.79	\$49,496	High school diploma or equivalent	None	Moderate-term on-the-job training
4	47-4011	Construction and Building Inspectors	250	260	10	4.0%	170	120	300	\$37.32	\$77,619	High school diploma or equivalent	5 years or more	Moderate-term on-the-job training
4	49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	840	890	50	6.0%	310	400	760	\$31.43	\$65,365	High school diploma or equivalent	None	Long-term on-the-job training
4	49-3041	Farm Equipment Mechanics and Service Technicians	550	610	60	10.9%	190	290	540	\$23.62	\$49,115	High school diploma or equivalent	None	Long-term on-the-job training

2022-2032 Occupational Employment Projections Bakersfield Metropolitan Statistical Area (Kern County)														
SOC Level ^[1]	SOC Code ^[2]	Occupational Title ^[3]	Base Year Employment Estimate 2022 ^{[4][5]}	Projected Year Employment Estimate 2032	Numeric Change 2022-2032 ^[6]	Percent-age Change 2022-2032	Exits ^[7]	Transfers ^[8]	Total Job Openings ^[9]	Median Hourly Wages ^[10]	Median Annual Wages ^[10]	Entry Level Education ^{[11][12]}	Work Experience ^{[11][12]}	On-the-Job Training ^{[11][12]}
4	49-3042	Mobile Heavy Equipment Mechanics, Except Engines	660	760	100	15.2%	230	350	680	\$31.94	\$66,427	High school diploma or equivalent	None	Long-term on-the-job training
4	49-3092	Recreational Vehicle Service Technicians	60	60	0	0.0%	20	40	60	\$29.01	\$60,337	High school diploma or equivalent	None	Long-term on-the-job training
4	49-3093	Tire Repairers and Changers	320	350	30	9.4%	130	240	400	\$17.58	\$36,560	High school diploma or equivalent	None	Short-term on-the-job training
4	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	830	910	80	9.6%	270	450	800	\$29.66	\$61,690	Postsecond ary non-degree award	None	Long-term on-the-job training
4	49-9041	Industrial Machinery Mechanics	1,050	1,240	190	18.1%	410	470	1,070	\$32.45	\$67,499	High school diploma or equivalent	None	Long-term on-the-job training
4	49-9043	Maintenance Workers, Machinery	110	120	10	9.1%	60	50	120	\$28.25	\$58,765	High school diploma or equivalent	None	Long-term on-the-job training
4	49-9051	Electrical Power-Line Installers and Repairers	200	230	30	15.0%	60	100	190	\$61.34	\$127,576	High school diploma or equivalent	None	Long-term on-the-job training
4	49-9071	Maintenance and Repair Workers, General	2,730	2,900	170	6.2%	1,240	1,290	2,700	\$23.85	\$49,604	High school diploma or equivalent	None	Moderate-term on-the-job training
4	49-9081	Wind Turbine Service Technicians	80	140	60	75.0%	40	60	160	\$38.24	\$79,533	Postsecond ary non-degree award	None	Long-term on-the-job training
4	49-9098	Helpers--Installation, Maintenance, and Repair Workers	290	320	30	10.3%	190	150	370	\$19.44	\$40,412	High school diploma or equivalent	None	Short-term on-the-job training
4	49-9099	Installation, Maintenance, and Repair Workers, All Other	480	550	70	14.6%	200	280	550	\$23.71	\$49,333	High school diploma or equivalent	None	Moderate-term on-the-job training
4	51-4121	Welders, Cutters, Solderers, and Brazers	990	1,130	140	14.1%	320	700	1,160	\$28.94	\$60,197	High school diploma or equivalent	None	Moderate-term on-the-job training

^[1] The occupations in the Standard Occupational Classification (SOC) system are classified at four levels of aggregation to suit the needs of various data users: major group, minor group, broad occupation, and detailed occupation. Each lower level of detail identifies a more specific group of occupations. collecting, calculating, or disseminating data.

^[3] To improve data quality, the Occupational Employment and Wage Statistics (OEWS) program has aggregated some 2018 SOC detailed occupations into SOC broad occupations or OEWS-specific combinations.

^[4] Data sources: U.S. Bureau of Labor Statistics' Current Employment Statistics (CES), Quarterly Census of Employment and Wages (QCEW) industry employment, and Occupational Employment and Wage Statistics (OEWS) data.

^[5] Occupational employment projections include self-employed, private household workers, farm, and nonfarm employment. Occupations with employment below 50 in 2022 are excluded. Occupation subtotals may not add to the totals due to rounding and the suppression of data.

^[6] Numeric change measures the projected number of job gains or losses in an occupation for the projection period.

^[7] Exits are the projected number of workers leaving an occupation and exiting the labor force entirely.

^[8] Transfers are the projected number of workers leaving an occupation and transferring to a different occupation.

^[9] Total job openings is the sum of exits, transfers, and numeric change.

^[10] Median wages are the estimated 50th percentile of the distribution of 2024 first quarter wages. 50 percent of workers in an occupation earn wages below, and 50 percent earn wages above the median wage. Wages do not include self-employed or unpaid family workers. An estimate could not be provided for wages listed as \$0. Median Hourly Wages have been rounded up to \$16.00 and Median Annual Wages to \$33,280 to reflect state minimum wage laws as of January 1, 2024.

^[11] The Bureau of Labor Statistics develops and assigns education and training categories to each occupation. For more information please see the [Education and Training Data page](#) on the Bureau of Labor Statistics website.

^[12] N/A - Information is not available.

Projections for previous periods are not always comparable to the latest projections, due to changes in industry, occupational, and geographical classifications; historical data revision; and changes in data collection and projections procedures.

For more information please see the Employment Development Department (EDD) datasets at the [Open Data Portal](#).