



HIGHWAY, STREET, AND BRIDGE CONSTRUCTION

CENTRAL VALLEY REGION

JUNE 2008



CENTER OF EXCELLENCE,
CENTRAL REGION

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REAL-TIME DATA TO ADVANCE
COMMUNITY COLLEGES

Highway, Street, and Bridge Construction

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IN TERMS OF GROWTH RATE, HIGHWAY, STREET AND BRIDGE CONSTRUCTION JOBS IN THE CENTRAL REGION ARE GROWING AT FOUR TIMES THE STATEWIDE AVERAGE FROM THE PERIOD OF 2007-2017, WITH 867 NEW JOBS PROJECTED. – SOURCE: EMSI COMPLETE DATA

Executive Summary

The highway, street and bridge construction industry is a growing industry in California and in the Central Region. With increasing employment opportunities, high wages, and a variety of career options, the highway, street and bridge construction industry provides opportunities for community colleges in the Central Region to build upon existing programs or create new programs. Although there has been a clear identification of the need for transportation infrastructure, the employment needs associated with the increase in transportation infrastructure have been vague. Because the infrastructure development process is a time intensive process typically spanning ten or more years, it is difficult to project *when* workers will be needed and *how many* workers will be needed. A number of factors contributed to the research of the highway, street and bridge construction industry, including:

- Increasing population
- Aging population
- Increasing traffic congestion
- Environmental concerns
- Housing developments
- Bond measures

The industry is facing a substantial projected increase in job openings over the next ten years. In addition to a projected increase of over 800 new jobs¹, legislation and funding on State and Federal levels may potentially add thousands of new jobs in the Central Region. Many of the occupations in the highway, street and bridge construction industry require short term on the job training. However, there is an opportunity for colleges in the Central Region to train entry-level engineers and first-line supervisors. Currently, 12 colleges in the Central Region offer some form of Associate Degree level engineer curriculum and four colleges offer curriculum to train first-line supervisors. Research conducted in the highway, street and bridge construction industry for the Central Region reveals a significant number of employment opportunities in a growing industry. Program development opportunities for Central Region community colleges include:

- Engineers/Civil Engineering Technicians
- First-line Supervisors of Construction Trades
- Construction Managers
- Surveyors

¹ Source: EMSI Complete Data

Introduction

The California Community Colleges System has charged the Economic and Workforce Development (EWD) Network with identifying industries and occupations that have unmet employee development needs. These industries will provide opportunities for colleges to partner with businesses in order to address their workforce development needs.

The highway, street and bridge construction industry has been highlighted recently as a growing and vital sector of the construction field in several reports². These reports highlight the increased reliance on transportation in the region combined with an increasing population contributing to the growing need for transportation infrastructure.

Although there has been a clear identification of the need for transportation infrastructure, the employment needs associated with the increase in transportation infrastructure have been vague. Because the infrastructure development process is a time intensive process typically spanning ten or more years, it is difficult to project *when* workers will be needed and *how many* workers will be needed. The intent of this report is to add to the knowledge base of the highway, street and bridge construction industry by contributing research in this area and offering recommendations to community colleges on how to best address the workforce challenges of the industry. This report was created for colleges in the Central Region, which includes 15 colleges covering 15 counties in California's Central Region to address specific needs for the highway, bridge and street construction industry.



Industry Overview

The highway, street, and bridge construction industry refers to establishments primarily engaged in the construction of highways (including elevated), streets, roads, airport runways, public sidewalks, or bridges. The work performed may include new work, reconstruction, rehabilitation, repairs, and maintenance. Specialty trade contractors are included in this group if they are engaged in activities primarily related to highway, street, and bridge construction (e.g., installing guardrails on highways)³. The industry is facing a substantial projected increase in job openings over the next ten years. In addition to a projected increase of over 800 new jobs⁴, legislation and funding on State and Federal levels may potentially add thousands of new jobs in the Central Region.

Economic Impact

Highway, street, and bridge construction falls under the larger industry cluster of construction (a full listing of industries included in the construction cluster is located in Appendix A). The construction cluster is a major economic base in the Central Region, contributing 20% of the regional economy (\$16 billion) and 19% of jobs⁵. In 2007, the

² See: *California's Regional Progress Report, 2007*; or *Running on Empty: The importance of Proposition 42 to California's transportation infrastructure*.

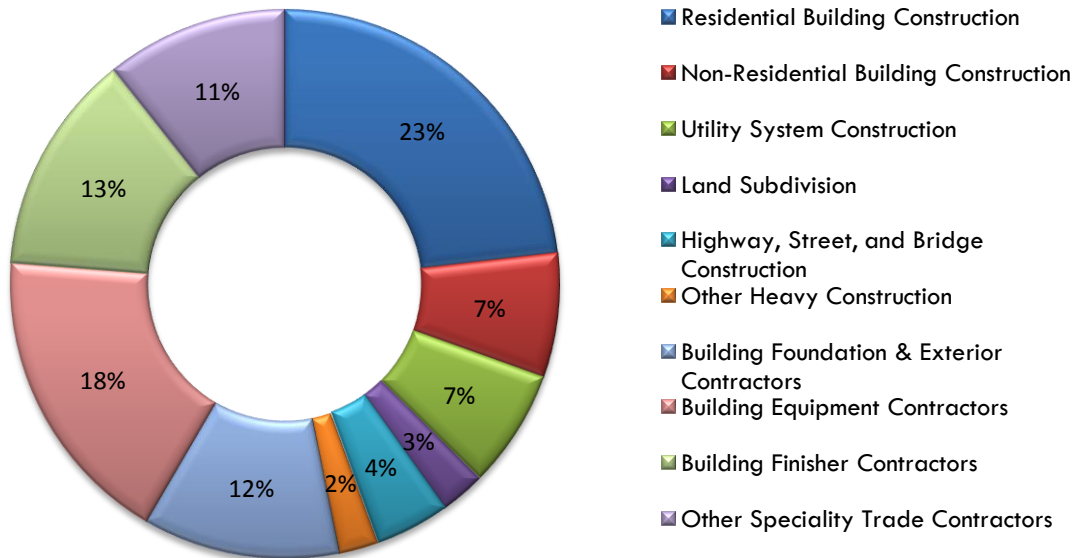
³ Source: U.S. Census Bureau 2007 NAICS Definitions

⁴ Source: EMSI Complete Data

⁵ Source: EMSI Complete Data

highway, street, and bridge construction industry employed over 2,000 individuals in the region, with an average annual salary of \$83,000. Figure 1 illustrates the sales revenue distribution for the construction cluster by industry for the Central Region. In 2007, the highway, street, and bridge construction industry contributed 4% (\$726 million) of sales to the Central Region.

Figure 1: Percent of Construction Sales by Industry Sector, Central Region 2007



Influencing factors

There are multiple factors statewide contributing to the increasing need for highway, street, and bridge construction. The most prevalent factors influencing transportation infrastructure development in the Central Region are⁶:

- **Increasing population base:** From 2000 – 2006, California’s population increased by 9.8%. In the Central Region, the population grew by 16% during this same time period. This increase in population has impacted the need for increased road construction and maintenance.
- **Aging population:** Many regions throughout California, including the Central Region, will experience a decrease in households with children under age 18 while households without children will increase with the aging baby boomer population in the next 10 years. This demographic change will bring different demands for services, transportation, and mobility choices, and will affect demand for the type and preferred locations for homes.
- **Increasing traffic congestion:** The Central Region has become increasingly congested as transportation infrastructure has not kept pace with the growing population, expanding trade and goods movement, and increasing distances between jobs and housing. In the Central Region, both inter-regional commute and goods-movement corridors are a significant transportation concern. Additionally,

⁶ Source: California’s Regional Progress Report, 2007

there is a large strain on local streets and highway connections that have become overwhelmed by growth in the region.

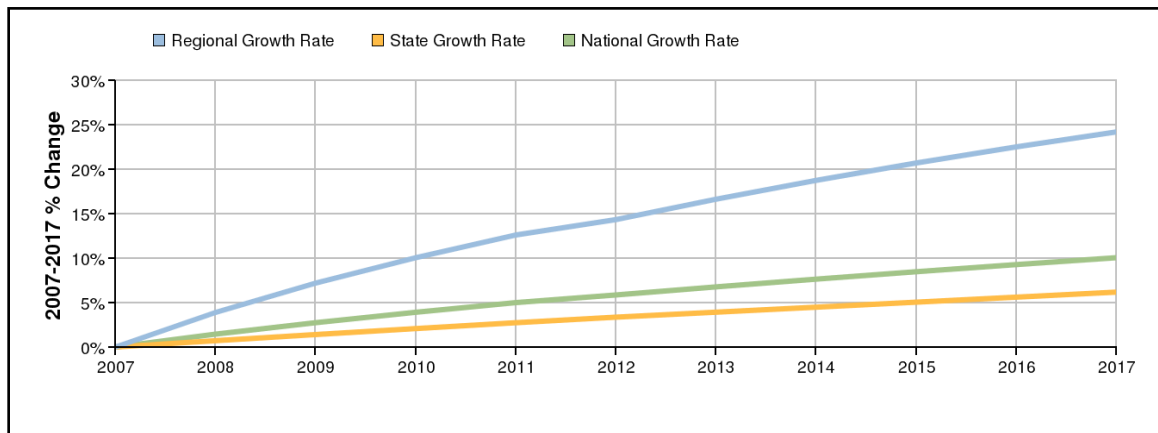
- **Environment:** The Central Region’s development patterns have accelerated the conversion of agricultural land and open space. The region is experiencing development pressures, air quality issues, and pollutants from agricultural and industrial sources.
- **Housing:** Like the rest of California, the Central Region has seen housing costs and development rates skyrocket in a short period of time. These factors have contributed to a significant strain on workforce supplies, infrastructure, increasing prices, and increased commute distances.

Many of the recent economic changes in the Central Region have put pressure on local communities and infrastructure. Throughout the region, communities are creating innovative methods of travel to work and ways to reduce traffic congestion and decrease the stress on local streets and highways. Even with these concerted efforts, there is a great need throughout the region for new construction and renovations. Once these changes in the region’s transportation infrastructure occur, there will be a need for trained workers in the highway, street and bridge construction industry.

Because legislation and funding are anticipated to make a significant impact on highway, street and bridge construction, this industry can be viewed as an evolving industry in the Central Region. During fiscal year 2006/2007 alone, the Department of Transportation allocated 286 projects throughout California worth \$2.3 Billion to Caltrans⁷.

Jobs in the highway, street and bridge construction industry are growing at an impactful rate. The Central Region accounts for 10% of the highway, street, and bridge construction industry jobs in California⁸. In terms of growth rate, jobs in the Central Region are growing at four times the statewide average from the period of 2007-2017. Employment projections indicate a 24% increase in *new jobs* in the Central Region by 2017 (867 new jobs). Table 1 illustrates the growth rate percentage in the highway, street, and bridge construction industry between the Central Region, California, and the United States.

Table 1: Highway, street, and bridge construction industry change projections, 2007-2017



⁷ Source: California Department of Transportation

⁸ Source: EMSI Complete Data

Wages in the highway, street and bridge construction industry pay well. In 2007, the average earnings per worker in the Central Region were \$82,582. These wages are also closely aligned with the statewide average of \$86,752 for the industry, and are well above the Central Region annual household income of \$41,967⁹.

Occupational Overview

The highway, street, and bridge construction industry contains more than 50 different occupations (see Appendix B for an occupation breakdown by county). In the Central Region, the largest number of jobs in the industry is for construction laborers (SOC code 47-2061). In 2007, there were 1,064 jobs for construction laborers in the Central Region. Employment projections indicate a 29% increase in new jobs (306 openings) by 2017. Replacement jobs are also a significant factor in looking at occupation projections. Across all occupations included in the highway, street and bridge construction industry, there are 11,742 replacement jobs projected by 2017 in addition to new jobs¹⁰. Table 2 demonstrates the occupations within the highway, street, and bridge construction industry with the most job openings.

Table 2: Occupational projections in the highway, street, and bridge construction industry, 2007-2017¹¹

SOC Code	Name	2007 Jobs	2017 Jobs	New Jobs	% Change
47-2061	Construction laborers	1,064	1,370	306	29%
47-2073	Operating engineers and other construction equipment operators	289	353	64	22%
47-2051	Cement masons and concrete finishers	287	372	85	30%
47-1011	First-line supervisors/managers of construction trades and extraction workers	280	350	70	25%
53-3032	Truck drivers, heavy and tractor-trailer	218	275	57	26%
47-2031	Carpenters	176	201	25	14%
47-2071	Paving, surfacing, and tamping equipment operators	98	123	25	26%
TOTAL		2,412	3,044	632	25%

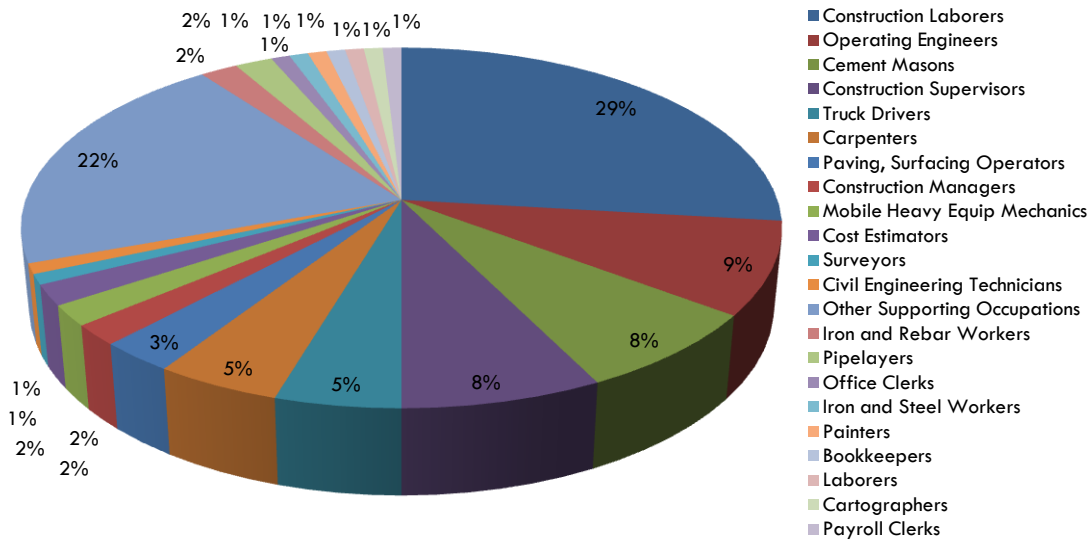
The occupation in the Central Region with the most number of jobs is construction laborers (29% of industry). Other occupations that are large components of the industry are operating engineers (9% of industry), cement masons (8% of industry), and first-line supervisors of construction trades (8% of industry). Figure 2 illustrates the occupational makeup of the highway, bridge and street construction industry based on share of the job market.

⁹ Source: U.S. Census Bureau, American Fact Finder 2006

¹⁰ Source: EMSI Complete Data. Projections on replacement jobs include all construction industries.

¹¹ Source: EMSI Complete Data

Figure 2: Occupation Distribution, Central Region



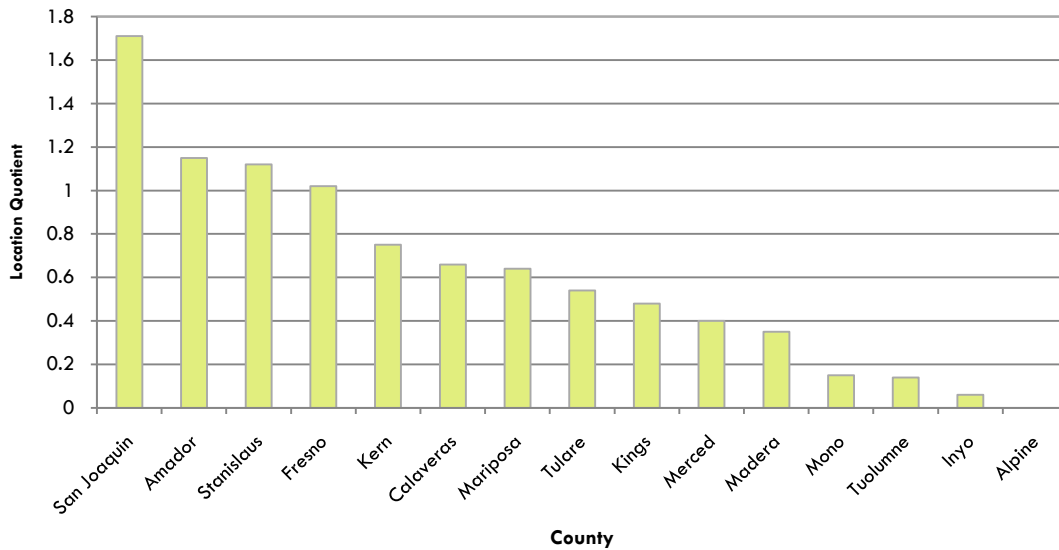
Many of the occupations in the highway, street and bridge construction industry require short term on the job training (see Appendix B for a complete listing of job descriptions and training requirements). However, there is an opportunity for colleges in the Central Region to train entry-level engineers and first-line supervisors. Currently, 12 colleges in the Central Region offer some form of Associate Degree level engineer curriculum and four colleges offer curriculum to train first-line supervisors. A complete listing of program offerings is located in Appendix C.

According to employment projections, the occupation within the highway, street, and bridge construction industry with the highest growth rate of new jobs is cement masons and concrete finishers (SOC Code 47-2051). The projected growth rate for cement masons and concrete finishers through 2017 is 30%. In the Central Region, the industry distribution of jobs is concentrated in San Joaquin County (1,040 jobs), Fresno County (961 jobs), Kern County (569 jobs), and Stanislaus County (526 jobs).

Industry concentration

Industries which have both a high industry concentration and relatively high number of jobs typically form a region’s economic base. This combination is true for the construction industry in the Central Region. Economic developers and government officials need to pay particular attention to these industries not only for the number of jobs they provide, but also for the multiplier effect – the jobs they create in other dependent industries like manufacturing or retail trade. In the Central Region, jobs in the highway, street and bridge construction industry are most concentrated in San Joaquin, Amador, and Stanislaus Counties. On the other hand, the concentration of businesses is higher in Fresno, San Joaquin, and Kern counties. Figure 3 illustrates highway, street and bridge construction industry concentration in the Central Region.

Figure 3: Industry concentration, Central Region



Employer Needs and Challenges

Employment needs in the highway, street and bridge construction industry are largely dependent on the economy. When the economy is strong, it is difficult for industry employers to fill positions and construction costs increase. On the other hand, when the economy is slow, construction costs decrease and it is easier to fill open positions. Overall the highway, street and bridge construction industry is securely funded (mostly through gasoline taxes); however the funding rarely matches the need. The function of the highway, street and bridge construction industry employers is to build, improve, and maintain roads and highways in the Central Region.

According to employers, there is no shortage of entry-level construction and maintenance employees. There is a large amount of difficulty in hiring well-qualified entry-level engineers, supervisors, technicians, planners/surveyors, and environmentalists. Employers also expect to be significantly impacted by retirements in the next five years. Industry projections also indicate a significant impact from retirements, with as many as 8,000 vacant jobs due to retirements¹² by 2017.

The highway, street and bridge construction industry is also highly regulated by environmental laws and regulations. In executive interviews, every employer expressed concern with existing educational programs not teaching students about environmental issues. Every employee, regardless of the job classification, should be aware of what the basic environmental rules, regulations, and considerations are regarding highway, street and bridge construction.

Another challenge employers expressed was a lack of experiential training with students completing educational programs. Employers have a need for workers with experience in

¹² Source: EMSI Complete Data

designing a road or using software design programs. Overall, new employees are lacking a hands-on training experience

A third challenge employers are facing is hiring employees with the ability to write and communicate well. Many new employees are entering the workforce unable to effectively communicate. According to employers, these deficiencies not only hamper the quality of work produced, but do not allow the employee the opportunity to move up in career pathways.

Overall, employers participating in executive interviews were aware of the community colleges in the Central Region as a resource for providing training to employees; however companies throughout the region are not involved in active partnerships with the colleges. When asked what community colleges in the region should consider for program development in creating training programs for highway, street and bridge construction, the following were the most prevalent responses:

- Provide more emphasis on hands-on training (less theoretical emphasis)
- Incorporate environmental issues, laws, and regulations into each program
- Provide training on Cal Trans’ standards for highway, street and bridge construction
- Incorporate concrete design (basic theory), permitting processes, and right-of-way issues into training programs
- Teach writing and communication skills

Community Support and Resources

There are opportunities for regional community colleges and Economic and Workforce Development (EWD) initiatives to partner with employers, industry associations, and workforce agencies to meet employer needs. Well-developed partnerships can help to meet the projected need for skilled workers in the highway, street, and bridge construction industry through a variety of resources and assistance. Table 3 below summarizes the existing and potential partnerships that can be leveraged.

Table 3: Highway, street and bridge construction partnerships, Central Region

Partner	Type of organization	Contribution to partnership
Center for Infrastructure Equity (www.policylink.org)	Public policy	<ul style="list-style-type: none"> • Advocacy • Policy research
Workforce Investment Boards (WIB) and One-stop centers	Public workforce development	<ul style="list-style-type: none"> • Access to job seekers • Access to employers • Training funds • Employment resources
Regional colleges and Central Region Consortium (www.crconsortium.com)	Workforce training and development	<ul style="list-style-type: none"> • Education and training
Advanced Transportation Technologies and Energy, Fresno City	Community college EWD program	<ul style="list-style-type: none"> • Technical assistance • Curriculum

College (www.fresnocitycollege.edu/appliedtech/att)		development <ul style="list-style-type: none"> • Incumbent worker training
Centers for Applied Competitive Technologies (CACT), Fresno City College www.cact.org/fresno	Community college EWD program	<ul style="list-style-type: none"> • Technical assistance • Curriculum development • Incumbent worker training
Centers of Excellence Modesto Junior College www.coeccc.net	Community college EWD program	<ul style="list-style-type: none"> • Forecast industry workforce needs • Industry research • Partnership development

College Response and Issues

To find existing colleges within the Central Region who may already offer certificate or degree programs within the field of highway, street and bridge construction, a review of the California Community College's Taxonomy of Programs (TOPs) was conducted. The following table indicates programs in the Central Region to train workers in the highway, street and bridge construction industry. A complete listing of programs statewide can be found in Appendix D.

Table 4: Existing highway, street and bridge construction industry programs, Central Region community colleges

TOPS Code	Program Name	College (s)	Program Description
0957.30	Surveying	None	Surveying and mapping of angles, elevations, points and contours used for construction, map-making, urban planning, or other purposes. Includes related applications of Global Positioning Systems (GPS) and Geographic Information Systems (GIS).
0957.00	Civil and Construction Management Technology	<ul style="list-style-type: none"> • Fresno City College • Hartnell College • Modesto Junior College • San Joaquin Delta College 	Application of procedures and techniques related to civil and construction management, including estimating and bidding, scheduling and control, inspection, building systems, construction practices, quality control, labor and safety practices. Includes public works management.
0302.00	Environmental Studies	None	Study of environment-related issues, including policy and legislation, social, legal and economic aspects, and scientific principles of the ecosystem and environmental conservation.
0924.00	Engineering	<ul style="list-style-type: none"> • Bakersfield 	Technical support of engineering,

	Technology, General	College <ul style="list-style-type: none"> • Cerro Coso • Merced College • Modesto Junior College 	including the use of civil and mechanical engineering principles, physical sciences, basic physics, mathematics, surveying, materials testing, hydraulics and pneumatics, and the preparation of plans, specifications, and engineering reports.
0947.20	Heavy Equipment Maintenance	• San Joaquin Delta College	Maintenance, repair, and overhaul of heavy equipment.
0947.30	Heavy Equipment Operation	• Bakersfield college	Operation of heavy equipment, including earth moving, demolition, and construction equipment.
0952.00	Construction Crafts Technology	<ul style="list-style-type: none"> • Bakersfield College • Fresno City College • Hartnell College • Modesto Junior College • College of the Sequoias 	Lay out, fabrication, erection, installation and repair of buildings, highways, airports, and other structures and fixtures, including framing, construction materials, estimating, blueprint reading and use of tools.
2102.10	Public Works	None	Practical instruction in street construction and maintenance and other public infrastructure services.

Gaps Identified

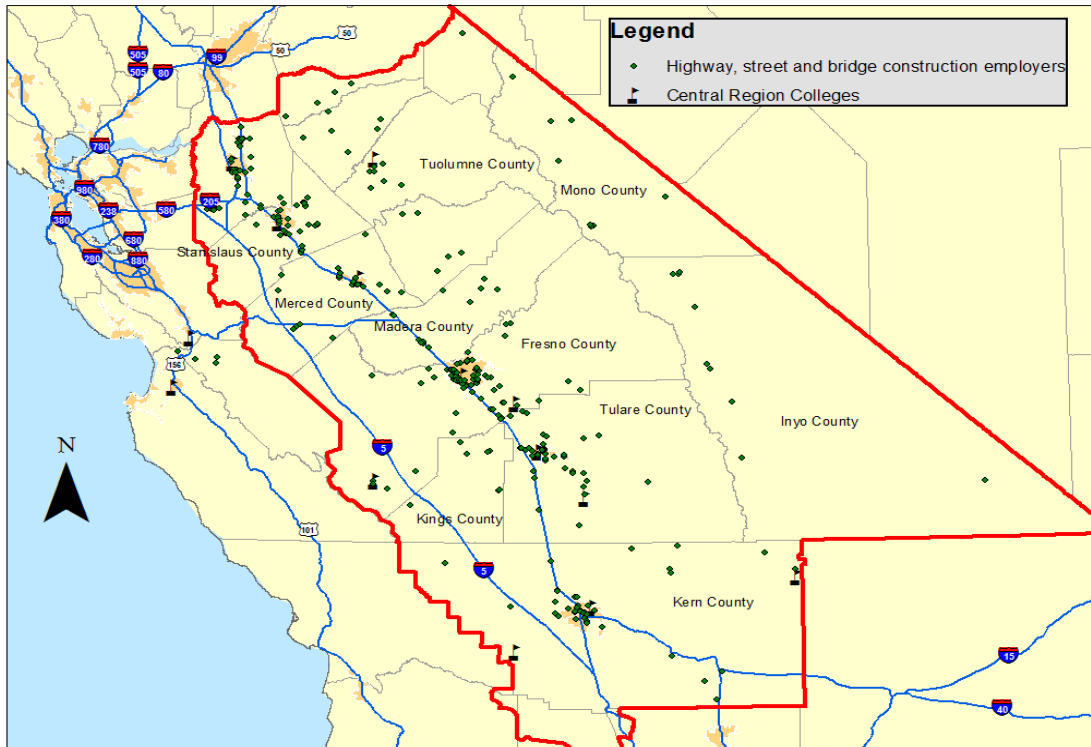
According to employment projections, research data, and employer interviews, the greatest need for training programs in the highway, street and bridge construction industry are:

- Surveying
- Civil and Construction Management
- Heavy Equipment Maintenance and Operation
- Public Works

In terms of the current highway, street and bridge construction industry distribution, there are over 300 employers in the Central Region¹³. Figure 4 illustrates the location of highway, street and bridge construction employers in the Central Region in relationship to community colleges. Most employers in the region are clustered around Stanislaus, Fresno and Kern Counties. However, there is a fairly consistent distribution of employers throughout the region, suggesting that programs to train workers would need to be similarly distributed.

¹³ Source: Info USA

Figure 4: Highway, street and bridge construction industry employers, Central Region



Conclusion and Recommendations

Employers and leaders agree that workforce training issues are an important factor for the highway, street and bridge construction industry regarding key occupations. All employers interviewed for this report feel there is no shortage of or difficulty in hiring skilled construction laborers or cement masons. There is a significant level of difficulty in hiring skilled entry-level engineers (Associate's Degree), surveyors, and supervisors/managers. Based on a review of existing data, occupations included in the highway, street and bridge construction industry fall into three levels for community college consideration in program development:

Occupations with most significant community college training potential:

- Engineers/Civil Engineering Technicians
- First-line Supervisors of Construction Trades
- Construction Managers
- Surveyors

Other occupations with community college training potential (less urgent):

- Operating Engineers
- Paving, Surfacing, and Tamping Equipment Operators
- Mobile Heavy Equipment Mechanics
- Cost Estimators

Occupations with no need for training, or need is currently being met:

- Construction Laborers
- Cement Masons and Concrete Finishers
- Carpenters
- Truck Drivers

In terms of program development or contract education opportunities, Table 5 illustrates the occupations in the highway, street and bridge construction industry and the corresponding community college program.

Table 5: Community College programs to address highest occupation needs

Occupation	Training Program (s)	Number of program completions, 2007	Average annual # of new & replacement jobs	Employment Gap
Engineers/ civil engineering technicians	• Engineering	925	28	-14
First line supervisors of construction trades	• Civil and construction management technology	310	285	-229
Construction managers			100	
Cost estimators			128	
Surveyors			26	
Operating engineers	• Diesel technology	843	149	602 (potential oversupply)
Paving, surfacing and tamping equipment operators			24	
Mobile heavy equipment mechanics			68	
Construction laborers	• Construction craft technology	2,250	451	1,052 (potential oversupply)
Cement masons and concrete finishers			213	
Carpenters			534	

Based on employer survey findings, executive interviews, and secondary research on the medical device industry, the following recommendations were developed for colleges in the Central Region considering program development. Overall, there are several opportunities for the community colleges in the highway, street and bridge construction industry in the Central Region.

¹⁴ Engineering programs in community colleges are training workers for all engineering occupations. Therefore, an accurate calculation of a gap in employment based on program completions is difficult. Industry validation indicates a strong need for entry-level engineers in the highway, street and bridge construction industry.

1. **Collaborate with industry employers:** As community colleges in the Central Region consider curriculum for the highway, street and bridge construction industry, leading industry employers – Caltrans, Teichert, and local departments of public works – should be included in the process as coursework and training programs are developed. Industry trade associations such as the American Public Works Association (APWA) can provide assistance in any collaboration with these employers. An example of this type of collaboration is the partnership between Caltrans and San Joaquin Delta College, where students receive specific funding to participate in the engineering program. Once students complete the program at San Joaquin Delta, they move to a 4-year Civil Engineering program. This partnership and collaboration is also useful in helping the colleges incorporate specific topics into training programs (e.g., environmental issues, right of way, and permitting processes).
2. **Emphasize writing and communication skills in existing programs:** According to employer interviews, the biggest deficiency amongst employees is the ability to write and communicate well. These skills are vital in the highway, street and bridge construction industry at all levels of employment. Additionally, employees will not be able to move up in career pathways without decent writing and communication skills. Students who are being trained for the highway, street and bridge construction industry should be aware that communication and writing skills are a critical skill in employment. Curriculum should incorporate writing and communication throughout the coursework to improve on this current deficiency.

Preparing students to work in the highway, street and bridge construction industry is clearly relevant to the mission of California Community Colleges. Central Region community colleges have the opportunity to develop or expand programs to meet industry needs, particularly in the areas of engineering and supervision of employees.

References

California State EDD LMID (www.calmis.ca.gov)

U.S. Department of Labor ETA – Occupational Outlook (www.doleta.gov)

Economic Modeling Specialists, Inc. (www.economicmodeling.com/)

U.S. Census Bureau, <http://factfinder.census.gov>, 2008.

U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook (www.bls.gov/oco/home.htm).

Appendix A: Construction Industries

Industry (NAICS Code)			
Construction of buildings (236)			
- Residential building construction (23611) <ul style="list-style-type: none"> ○ New single family general contractors (236115) ○ New multi family general contractors (236116) ○ New housing operative builders (236117) ○ Residential remodelers (236118) 		- Non Residential building construction (2362) <ul style="list-style-type: none"> ○ Industrial building construction (236210) ○ Commercial building construction (236220) 	
Heavy and civil engineering construction (237)			
- Utility system construction (2371) <ul style="list-style-type: none"> ○ Water & sewer system construction (237110) ○ Oil & gas pipeline construction (237120) ○ Power & communication system construction (237130) 	- Land subdivision (237210)	- Highway, street and bridge construction (237310)	- Other heavy construction (237990)
Specialty trade contractors (238)			
- Building foundation & exterior contractors (2381) <ul style="list-style-type: none"> ○ Residential poured foundation contractors (23811) ○ Non-residential poured foundation contractors (23812) ○ Residential structural steel and precise concrete contractors (238121) ○ Non-residential poured foundation contractors (23812) ○ Residential structural steel and precise concrete contractors (2381221) ○ Residential framing contractors (238131) ○ Non-residential framing contractors (238132) ○ Residential masonry contractors (238141) ○ Non-residential masonry contractors (238141) ○ Residential glass and glazing contractors (238151) ○ Non-residential glass and glazing contractors (238152) ○ Residential roofing contractors (238161) ○ Non-residential roofing contractors (238162) ○ Residential siding contractors (238171) ○ Non-residential siding contractors (238172) ○ Other residential exterior contractors (238191) ○ Other non-residential exterior contractors (238192) 	- Building equipment contractors (2382) <ul style="list-style-type: none"> ○ Residential electrical contractors (238211) ○ Non-residential electrical contractors (238212) ○ Residential plumbing & HVAC contractors (238221) ○ Non-residential plumbing & HVAC contractors (238222) ○ Other residential building equipment contractors (238291) ○ Other non-residential building equipment contractors (238292) 	- Building finishing contractors (2383) <ul style="list-style-type: none"> ○ Residential drywall contractors (238311) ○ Non-residential drywall contractors (238312) ○ Residential painting contractors (238321) ○ Non-residential painting contractors (238322) ○ Residential flooring construction (238331) ○ Non-residential flooring construction (238332) ○ Residential tile & terrazzo contractors (238341) ○ Non-residential tile & terrazzo contractors (238342) ○ Residential finish carpentry contractors (238351) ○ Non-residential finish carpentry contractors (238352) ○ Other residential finishing contractors (238391) ○ Other non-residential finishing contractors (238392) 	- Other specialty trade contractors (2389) <ul style="list-style-type: none"> ○ Residential site preparation contractors (238911) ○ Non-residential site preparation contractors (238912)

Appendix B: Job Descriptions

Construction Laborers

Construction laborers clean and prepare construction sites. They load, unload, identify, and distribute building materials to the appropriate location according to project plans and specifications. Laborers also mix and pour concrete, and are responsible for oversight of the installation and maintenance of traffic control devices and patterns. At highway construction sites, construction laborers clear and prepare work zones and right of ways, install traffic barricades, and control traffic in work zones.

This is an entry-level position which requires short term on the job training. In some cases construction laborers specialize in a specific area, such as hazardous materials removal which may require formalized training and/or certification.

Knowledge, Skills, and Abilities

The top KSA's for construction laborers include:

- Building and Construction (Knowledge)
- Mechanical (Knowledge)
- Mathematics (Knowledge)
- Coordination (Skill)
- Equipment Maintenance (Skill)
- Equipment Selection (Skill)
- Static Strength (Ability)
- Trunk Strength (Ability)
- Manual Dexterity (Ability)

Employment Outlook¹⁵

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	3,944	695	257	952	24%	95	\$18.04
Kern	4,839	1,160	314	1,474	30%	147	\$16.09
Kings	255	32	15	47	19%	5	\$17.10
Madera	438	56	24	80	18%	8	\$18.59
Merced	1,028	121	68	189	18%	19	\$18.18
San Joaquin	2,763	444	178	622	23%	62	\$24.92
Stanislaus	2,189	417	139	556	25%	56	\$18.89
Tulare	1,386	240	85	325	23%	33	\$19.94
Mother Lode	1,380	196	74	270	20%	27	\$18.43
Central Region	18,224	3,360	1,153	4,513	25%	451	\$18.85

¹⁵ Note: Employment data includes all construction industries

Surveyors

Surveyors work to establish official land, airspace, and water boundaries. They write descriptions of land for deeds, leases, and other legal documents; define airspace for airports; and take measurements of construction and mineral sites. Other surveyors provide data about shape, contour, location, elevation, or dimension of land or land features. Surveyors also measure distances, directions, and angles between points and elevations of points, lines, and contours on, above, and below the Earth's surface. Surveyors also research legal records, look for evidence of previous boundaries, and analyze data to determine the location of boundary lines.

This is a mid-level position which typically requires an advanced degree. Many employers are willing to hire surveyors with an Associate's Degree and the appropriate State licensure. Most State licensing boards require that individuals pass a written examination given by the National Council of Examiners for Engineering and Surveying (NCEES).

Knowledge, Skills, and Abilities (KSA's)

The top KSA's for surveyors include:

- Mathematics (Knowledge)
- Building and construction (Knowledge)
- Geography (Knowledge)
- Mathematics (Skill)
- Coordination (Skill)
- Critical thinking (Skill)
- Oral comprehension (Ability)
- Near vision (Ability)
- Oral expression (Ability)

Employment Outlook¹⁶

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	154	20	45	65	42%	7	\$28.52
Kern	40	4	9	13	34%	1	\$31.56
Kings	44	0	13	13	30%	1	\$38.57
Madera	48	(-3)	14	11	24%	1	\$26.51
Merced	70	(-3)	21	18	26%	2	\$29.56
San Joaquin	84	34	24	58	69%	6	\$27.69
Stanislaus	110	25	33	58	52%	6	\$30.73
Tulare	22	2	6	8	35%	<1	\$30.25
Mother Lode	53	(-1)	15	14	26%	1	\$29.59
Central Region	624	79	180	259	41%	26	\$29.81

¹⁶ Note: Employment data includes all construction industries

Construction Managers

Construction managers plan, direct, and coordinate a wide variety of construction projects, including the building of all types of residential, commercial, and industrial structures, roads, bridges, wastewater treatment plants, and schools and hospitals. Construction managers may oversee an entire project or just part of one. They schedule and coordinate all design and construction processes, including the selection, hiring, and oversight of specialty trade contractors, but they usually do not do any actual construction of the structure.

Construction managers are a mid- to high-level position typically requiring an Associate's Degree. There are no state regulated requirements for licensure or certification to become a construction manager.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for construction managers are:

- Building and construction (Knowledge)
- Mathematics (Knowledge)
- Design (Knowledge)
- Coordination (Skills)
- Judgment and decision making (Skills)
- Mathematics (Skills)
- Oral expression (Ability)
- Oral comprehension (Ability)
- Information ordering (Ability)

Employment Outlook¹⁷

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	1,051	138	56	194	18%	19	\$43.15
Kern	1,240	266	61	327	26%	33	\$34.38
Kings	69	14	0	14	21%	1	\$32.64
Madera	180	23	4	27	15%	3	\$37.32
Merced	202	25	5	30	15%	3	\$44.10
San Joaquin	766	87	38	125	16%	13	\$51.17
Stanislaus	629	75	29	104	16%	10	\$40.43
Tulare	441	43	17	60	14%	6	\$41.20
Mother Lode	576	117	9	126	22%	13	\$30.19
Central Region	5,155	786	220	1,006	20%	100	\$39.98

¹⁷ Note: Employment data includes all construction industries

Carpenters

Carpenters construct, erect, install, and repair structures and fixtures made from wood and other materials. Carpenters work from blueprints to create a layout for a project according to local building codes. In the highway, street and bridge construction industry, carpenters construct wooden forms for pouring concrete, erecting scaffolding, or build tunnel bracing.

This is an entry level position that requires on the job training or an apprenticeship. Training for carpenters involves hands-on training and little theory. There are no license or certification requirements for carpenters hired through an employer. Carpenters completing a formal apprenticeship are typically certified as a journeyman upon successful completion.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for carpenters include:

- Building and construction (Knowledge)
- Mechanical (Knowledge)
- Mathematics (Knowledge)
- Management of personnel resources (Skills)
- Speaking (Skills)
- Mathematics (Skills)
- Excellent flexibility (Ability)
- Visualization (Ability)
- Information ordering (Ability)

Employment Outlook¹⁸

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	4,396	925	463	1,388	32%	139	\$25.23
Kern	3,258	1,048	278	1,326	41%	133	\$27.31
Kings	271	49	24	73	27%	7	\$21.62
Madera	839	125	84	209	25%	21	\$28.26
Merced	613	85	51	136	22%	14	\$34.72
San Joaquin	2,708	342	267	609	23%	61	\$33.63
Stanislaus	2,719	525	283	808	30%	81	\$28.05
Tulare	1,316	226	114	340	26%	34	\$27.78
Mother Lode	1,870	296	152	448	24%	45	\$26.95
Central Region	17,991	3,619	1,716	5,335	30%	534	\$28.07

¹⁸ Note: Employment data includes all construction industries

Paving, Surfacing, and Tamping Equipment Operators

Paving, surfacing and tamping equipment operators use levers and other controls to operate machines that spread and level asphalt or spread and smooth concrete for roadways or other structures. Workers must be able to set up and inspect the equipment, make adjustments, and perform some maintenance and minor repairs.

This is an entry-level position requiring on the job training or short-term formalized training through a certificate program. Most employers do prefer to hire workers with a certificate through an accredited source.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for paving, surfacing and tamping equipment operators are:

- Building and construction (Knowledge)
- Mechanical (Knowledge)
- Public safety (Knowledge)
- Equipment selection (Skill)
- Operation monitoring (Skill)
- Equipment maintenance (Skill)
- Multi-limb coordination (Ability)
- Control precision (Ability)
- Static strength (Ability)

Employment Outlook¹⁹

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	106	29	20	49	46%	5	\$25.59
Kern	142	30	27	57	40%	6	\$18.44
Kings	10	1	2	3	29%	>1	\$23.13
Madera	35	7	7	14	39%	1	\$20.80
Merced	22	4	4	8	37%	>1	\$20.85
San Joaquin	99	21	19	40	41%	4	\$24.37
Stanislaus	67	16	13	29	43%	3	\$21.98
Tulare	64	12	12	24	38%	2	\$21.64
Mother Lode	36	7	7	14	38%	1	\$27.86
Central Region	580	127	111	238	41%	24	\$21.86

¹⁹ Note: Employment data includes all construction industries

Civil Engineering Technicians

Civil engineering technicians help civil engineers plan and oversee the building of highways, buildings, bridges, dams, wastewater treatment systems, and other structures and do related research. Some estimate construction costs and specify materials to be used, and some may even prepare drawings or perform land-surveying duties.

Environmental engineering technicians are a mid level position requiring an Associate's Degree or less. There are no licensing or certification requirements for environmental engineering technicians.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for civil engineering technicians are:

- Mathematics (Knowledge)
- Design (Knowledge)
- Engineering and technology (Knowledge)
- Mathematics (Skill)
- Reading comprehension (Skill)
- Active learning (Skill)
- Oral comprehension (Ability)
- Deductive reasoning (Ability)
- Written comprehension (Ability)

Employment Outlook²⁰

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	307	44	60	104	34%	10	\$20.66
Kern	194	17	37	54	28%	5	\$25.20
Kings	>10	-	-	-	-	-	-
Madera	>10	-	-	-	-	-	-
Merced	11	4	2	6	57%	>1	\$24.18
San Joaquin	109	26	21	47	43%	5	\$24.27
Stanislaus	84	9	16	25	30%	3	\$27.74
Tulare	102	9	20	29	28%	3	\$18.96
Mother Lode	38	3	7	10	27%	1	\$23.41
Central Region	847	112	163	275	33%	28	\$22.84

²⁰ Note: Employment data includes all construction industries

Operating Engineers

Operating engineers use several different types of power construction equipment. They may operate excavation and loading machines equipped with scoops, shovels, or buckets that dig sand, gravel, earth, or similar materials and load it into trucks or onto conveyors. Typically operating engineers maneuver bulldozers, trench excavators, road graders, and similar equipment.

This is an entry level position that typically requires moderate on the job training and/or formalized training. Many employers require operating engineers to possess a commercial driver's license.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for operating engineers include:

- Building and construction (Knowledge)
- Mechanical (Knowledge)
- Engineering and technology (Knowledge)
- Equipment maintenance (Skill)
- Equipment control (Skill)
- Operation and control (Skill)
- Control precision (Ability)
- Reaction time (Ability)
- Static strength (Ability)

Employment Outlook²¹

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	851	135	155	290	34%	29	\$24.64
Kern	1,356	167	250	417	31%	42	\$23.95
Kings	244	31	46	77	32%	8	\$19.18
Madera	169	32	30	62	37%	6	\$19.91
Merced	232	28	43	71	30%	7	\$20.05
San Joaquin	800	143	148	291	36%	29	\$26.98
Stanislaus	196	25	32	57	29%	6	\$31.17
Tulare	421	54	77	131	31%	13	\$19.58
Mother Lode	323	38	54	92	29%	9	\$22.94
Central Region	5,491	653	836	1,489	32%	149	\$23.84

²¹ Note: Employment data includes all construction industries

Cement Masons and Concrete Finishers

Cement masons and concrete finishers place and finish concrete. Workers must have a thorough knowledge of concrete characteristics so that, by using sight and touch, they can determine what is happening to the concrete and take measures to prevent defects. Many times workers perform all steps of laying concrete, from site preparation to finishing.

This is an entry level position requiring specific training on working with concrete. Training is provided on the use of tools, equipment, machines and materials of the trade. There are no certification or licensure requirements for cement masons and concrete finishers.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for cement masons and concrete finishers include:

- Building and construction (Knowledge)
- Public safety and security (Knowledge)
- Mathematics (Knowledge)
- Coordination (Skill)
- Mathematics (Skill)
- Active learning (Skill)
- Trunk strength (Ability)
- Control precision (Ability)
- Extent flexibility (Ability)

Employment Outlook²²

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	1,242	265	354	619	50%	62	\$17.04
Kern	1,075	261	305	566	53%	57	\$16.13
Kings	78	8	22	30	39%	3	\$15.39
Madera	70	5	19	24	35%	2	\$15.53
Merced	408	47	116	163	40%	16	\$11.26
San Joaquin	612	62	173	235	38%	24	\$17.31
Stanislaus	442	64	125	189	43%	19	\$21.98
Tulare	651	82	186	268	41%	27	\$10.68
Mother Lode	104	12	27	39	37%	40	\$19.23
Central Region	4,681	807	1,327	2,134	46%	213	\$15.20

²² Note: Employment data includes all construction industries

First Line Supervisors of Construction Trades

First line supervisors of construction trades directly supervise and coordinate activities of construction or extraction workers. This is an advanced position requiring an Associate's degree from an accredited institution.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for first line supervisors of construction trades includes:

- Building and construction (Knowledge)
- Mechanical (Knowledge)
- Mathematics (Knowledge)
- Coordination (Skill)
- Time management (Skill)
- Critical thinking (Skill)
- Oral expression (Ability)
- Oral comprehension (Ability)
- Written comprehension (Ability)

Employment Outlook²³

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	2,594	448	274	722	28%	72	\$33.30
Kern	2,753	522	272	794	29%	79	\$34.50
Kings	149	23	12	35	24%	4	\$29.49
Madera	286	39	30	59	21%	6	\$29.98
Merced	463	74	43	117	25%	12	\$31.63
San Joaquin	1,621	212	160	372	23%	37	\$39.35
Stanislaus	1,379	248	136	384	28%	38	\$31.17
Tulare	897	126	83	209	23%	21	\$29.49
Mother Lode	678	125	28	153	23%	15	\$31.17
Central Region	10,821	1,817	1,038	2,845	26%	285	\$33.58

²³ Note: Employment data includes all construction industries

Truck Drivers, Heavy

Heavy truck and tractor-trailer drivers operate trucks or vans with a capacity of at least 26,000 pounds gross vehicle weight. Workers transport goods including cars, heavy equipment, and other materials in liquid, loose, or packaged form. Workers are also responsible for ensuring proper loading and unloading of goods being transported.

This is a mid-level position requiring some level of formalized training. Workers are also required to have a commercial driver's license and a clean driving record. Some employers may also have age requirements for workers.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for heavy truck and tractor-trailer drivers include:

- Transportation (Knowledge)
- Public safety and security (Knowledge)
- English language (Knowledge)
- Equipment maintenance (Skill)
- Reading comprehension (Skill)
- Troubleshooting (Skill)
- Static strength (Ability)
- Reaction time (Ability)
- Response orientation (Ability)

Employment Outlook²⁴

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	5,625	46	858	904	16%	90	\$18.83
Kern	5,460	914	823	1,737	32%	174	\$19.42
Kings	858	136	136	272	32%	27	\$19.38
Madera	113	-13	0	-13	-9%	-1	\$29.43
Merced	1,890	171	291	462	24%	46	\$18.17
San Joaquin	5,615	1,253	891	2,144	38%	214	\$20.57
Stanislaus	3,772	342	591	933	25%	93	\$21.86
Tulare	2,981	250	468	718	24%	72	\$18.98
Mother Lode	578	85	82	167	29%	17	\$17.56
Central Region	26,912	3,183	4,140	7,323	27%	732	\$19.75

²⁴ Note: Employment data includes all construction industries

Mobile Heavy Equipment Mechanics

Mobile heavy equipment mechanics repair and maintain engines and hydraulic, transmission, and electrical systems for the equipment. Farm machinery, cranes, bulldozers, pavers, and railcars are all examples of heavy vehicles that require such service. Workers keep construction and surface mining equipment, such as bulldozers, cranes, graders, and excavators in working order. Typically, these workers are employed by equipment wholesale distribution and leasing firms, large construction and mining companies, local and federal governments, and other organizations operating and maintaining heavy machinery and equipment fleets.

This is a mid-level position requiring training in a heavy machining and equipment mechanic program. There are no certification or licensure requirements to be employed as a mobile heavy equipment mechanic, although voluntary certifications are available.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for mobile heavy equipment mechanics include:

- Mechanical (Knowledge)
- Engineering and technology (Knowledge)
- Customer service (Knowledge)
- Installation (Skill)
- Equipment maintenance (Skill)
- Troubleshooting (Skill)
- Auditory attention (Ability)
- Information ordering (Ability)
- Visualization (Ability)

Employment Outlook²⁵

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	465	61	89	150	32%	15	\$19.91
Kern	583	77	112	189	32%	19	\$18.65
Kings	42	5	8	13	31%	1	\$20.94
Madera	34	6	6	12	37%	1	\$19.36
Merced	61	11	12	23	37%	2	\$21.83
San Joaquin	407	123	78	201	49%	20	\$24.60
Stanislaus	135	25	25	50	37%	5	\$23.37
Tulare	52	11	9	20	39%	2	\$20.35
Mother Lode	62	8	11	19	31%	2	\$21.74
Central Region	1,839	329	351	680	37%	68	\$20.95

²⁵ Note: Employment data includes all construction industries

Cost Estimators

Cost estimators develop the cost information that business owners or managers need to make a bid for a contract or to decide the cost effectiveness of a proposed product or project. Regardless of the industry in which they work, estimators compile and analyze data on all of the factors that can influence costs, such as materials, labor, location, duration of the project, and special machinery requirements, including computer hardware and software.

This is a mid- to advanced-level position requiring an Associate's Degree in building science, construction management, construction science, or any related degree that contains coursework in cost estimating.

Knowledge, Skills and Abilities (KSA's)

The top KSA's for cost estimators includes:

- Administration and management (Knowledge)
- Mathematics (Knowledge)
- Production and processing (Knowledge)
- Active listening (Skill)
- Coordination (Skill)
- Reading comprehension (Skill)
- Oral comprehension (Ability)
- Oral expression (Ability)
- Near vision (Ability)

Employment Outlook²⁶

	2007 jobs	New jobs	Replacement jobs	Total new & replacement	% jobs	Average number of jobs annually	Median hourly wages
Fresno	776	215	153	368	47%	37	\$25.10
Kern	432	168	82	250	58%	25	\$28.54
Kings	12	3	2	5	40%	<1	\$28.79
Madera	80	21	15	36	45%	4	\$22.44
Merced	76	23	14	37	49%	4	\$25.75
San Joaquin	437	116	85	201	46%	20	\$29.44
Stanislaus	413	123	81	204	49%	20	\$25.89
Tulare	314	89	62	151	48%	15	\$19.74
Mother Lode	83	19	13	32	38%	3	\$19.31
Central Region	2,624	776	507	1,283	49%	128	\$25.64

²⁶ Note: Employment data includes all construction industries

Appendix C: Highway, street and bridge construction programs by college

TOPS Code	Program Name	Community Colleges With Current Programs		Program Description
0957.30	Surveying	<ul style="list-style-type: none"> College of the Canyons Sacramento City College Santiago Canyon College 	<ul style="list-style-type: none"> Cuyamaca College Santa Rosa Junior College 	Surveying and mapping of angles, elevations, points and contours used for construction, map-making, urban planning or other purposes. Includes related applications of Global Positioning Systems (GPS) and Geographic Information Systems (GIS).
0957.00	Civil and Construction Management Technology	<ul style="list-style-type: none"> Cabrillo College Cosumnes River College Diablo Valley College Fullerton College Laney College Los Angeles Pierce College San Diego Mesa College San Joaquin Delta College Southwestern College 	<ul style="list-style-type: none"> College of the Canyons College of the Desert Fresno City College Hartnell College Modesto Junior College City College of San Francisco Santa Rosa Junior College Ventura College Victor Valley Community College 	Application of procedures and techniques related to civil and construction management, including estimating and bidding, scheduling and control, inspection, building systems, construction practices, quality control, labor and safety practices. Includes public works management.
0302.00	Environmental Studies	<ul style="list-style-type: none"> Allan Hancock College College of the Desert Merritt College Sacramento City College Santa Barbara City College 	<ul style="list-style-type: none"> DeAnza College Feather River College Moorpark College Saddleback College 	Study of environment-related issues, including policy and legislation, social, legal, and economic aspects, and scientific principles of the ecosystem and environmental conservation.
0924.00	Engineering Technology, General	<ul style="list-style-type: none"> Allan Hancock College Antelope Valley College Butte College Cerritos College East Los Angeles City College Los Angeles City College Los Angeles Mission 	<ul style="list-style-type: none"> American River College Bakersfield College Cabrillo College Cerro Coso Community College Evergreen Valley College Los Angeles Harbor 	Technical support of engineering, including the use of civil and mechanical engineering principles, physical sciences, basic physics, mathematics, surveying, materials testing, hydraulics and pneumatics, and the preparation of plans, specifications, and engineering reports.

		<ul style="list-style-type: none"> College • Merced College • Riverside City College • City College of San Francisco • Santa Ana College • Ventura College 	<ul style="list-style-type: none"> College • College of Marin • Modesto Junior College • San Diego City College • College of San Mateo • Shasta College 	
0947.20	Heavy Equipment Maintenance	<ul style="list-style-type: none"> • Allan Hancock College • San Joaquin Delta College • Santiago Canyon College 	<ul style="list-style-type: none"> • San Diego Miramar College • Santa Ana College 	Maintenance, repair, and overhaul of heavy equipment.
0947.30	Heavy Equipment Operation	<ul style="list-style-type: none"> • Bakersfield College • Butte College 	<ul style="list-style-type: none"> • Butte College • Santiago Canyon College 	Operation of heavy equipment, including earth moving, demolition, and construction equipment.
0952.00	Construction Crafts Technology	<ul style="list-style-type: none"> • Bakersfield College • Cuesta College • Fresno City College • Hartnell College • Orange Coast College • Pasadena City College • San Jose City College • Shasta College • Victor Valley Community College 	<ul style="list-style-type: none"> • Cosumnes River College • El Camino College • Fullerton College • Modesto Junior College • Palo Verde College • College of the Redwoods • College of the Sequoias • Sierra College 	Lay out, fabrication, erection, installation, and repair of buildings, highways, airports, and other structures and fixtures, including framing, construction materials, estimating, blueprint reading, and use of tools.
2102.10	Public Works	<ul style="list-style-type: none"> • Citrus College • Palomar College • Victor Valley Community College 	<ul style="list-style-type: none"> • Los Angeles Trade-Technical • Santiago Canyon College 	Practical instruction in street construction and maintenance and other public infrastructure services.

Appendix D: How to Use this Report

About Us - Description of EWD

The Economic and Workforce Development (EWD) initiative is focused on building the capacity of the colleges in the area of economic and workforce development to enhance their ability to deliver education and training services to businesses and workers in high growth industries, new technologies, and other clusters of opportunities.

The Centers of Excellence (COE) within EWD provide information regarding workforce trends, increasing awareness and visibility about the colleges economic and workforce development programs and services, and building partnerships with business and industry. The difference this will make to the colleges is that it will position them as the workforce partners of choice to business and industry and ensure that college programs are current and responsive. This will contribute to the overall economic vitality of the communities in which they serve.

How to Use This Environmental Scan Report

The Centers of Excellence have undertaken Environmental Scanning to provide targeted and valuable information to community colleges on high growth industries and occupations. This report is intended to assist the decision-making process of California community college administrators and planners in addressing local and regional workforce needs and emerging job opportunities in the workplace as they relate to college programs. The information contained in this report can be used to guide program offerings, strengthen grant applications, and support other economic and workforce development efforts. This report is designed to provide current industry data that will:

- Define potential strategic opportunities relative to an industry's emerging trends and workforce needs;
- Influence and inform local college program planning and resource development; and
- Promote a future-oriented and market responsive way of thinking among stakeholders.

This Environmental Scan included a review of the California Regional Economies Project reports and Employment Development Department (EDD) Labor Market Information (LMID) projections that cover the communities in this region, as well as many other sources as referenced.

Important Disclaimer

All representations included in this Environmental Scan product/study have been produced from a secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings. The purpose of the Environmental Scan is to assist the California Community Colleges to respond to emerging market needs for workforce performance improvement. However, the Centers of Excellence, COE Host College or California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon this study including components or recommendations.

Additional Information

The Business and Workforce Performance Improvement Initiative is funded in part by the Chancellor's Office, California Community Colleges, Economic and Workforce Development Program. The total grant amount represents compensation for multiple documents or written reports through the Centers of Excellence. Our mission is to strengthen California's workforce and advance economic growth through education, training and job development.