**Transit Electrical Technology Occupations**

**Labor Market Information Report**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

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# Recommendation

It is difficult to determine the labor market gap for Transit Electrical Technology occupations since the occupational codes (SOC codes) selected appear to be spread across a variety of industry sectors (see table 5 on page 3). However, even if only 15% of the annual openings for this cluster of occupations are related to the transit/transportation sector, there would still be an annual undersupply of about 60 workers in the Bay region. In the East Bay, there would need to be 25% or higher of the annual openings in those occupations related to transit/transportation for there to be a labor market gap.

Los Medanos College (LMC) has provided information from transit employers that indicates a demand for workers with specialized skills; and the proposed new Certificate of Achievement in Transit Electrical Technology will provide these needed skills (see “Additional Evidence of Employer Demand” on page 3). Therefore, based on the available data, including LMC’s outreach to employers, there appears to be an undersupply of workers with Transit Electrical Technology skills and the addition of this program is recommended.

This report also provides student outcomes data on employment and earnings for Electronics and Electric Technology programs (TOP 0934). It is recommended that this data be reviewed to better understand how student outcomes for Electronics and Electric Technology programs at Los Medanos College and at other top performing colleges in the region and sub-region compare to the state programs in this area as well as outcomes across all programs in the region.

# Introduction

This report profiles Transit Electrical Technology Occupations in the 12 county Bay Region and the East Bay Sub-Region (Alameda and Contra Costa counties) for a new Transit Electrical Technology certificate at Los Medanos College.

* **Electric Motor, Power Tool, and Related Repairers (SOC 49-2092)**: Repair, maintain, or install electric motors, wiring, or switches.

*Entry-Level Educational Requirement:* *Postsecondary Nondegree Award*

*Training Requirement:* *Long-term on-the-job training*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 45%

* **Electrical and Electronics Installers and Repairers, Transportation Equipment (SOC 49-2093)**: Install, adjust, or maintain mobile electronics communication equipment, including sound, sonar, security, navigation, and surveillance systems on trains, watercraft, or other mobile equipment.

*Entry-Level Educational Requirement:* *Postsecondary Nondegree Award*

*Training Requirement:* *Long-term on-the-job training*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 51%

* **Electrical and Electronics Repairers, Commercial and Industrial Equipment (SOC 49-2094)**: Repair, test, adjust, or install electronic equipment, such as industrial controls, transmitters, and antennas.

*Entry-Level Educational Requirement:* *Postsecondary Nondegree Award*

*Training Requirement:* *Long-term on-the-job training*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 51%

* **Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (SOC 49-2095)**: Inspect, test, repair, or maintain electrical equipment in generating stations, substations, and in-service relays.

*Entry-Level Educational Requirement:* *Postsecondary Nondegree Award*

*Training Requirement:* *Long-term on-the-job training*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 51%

* **Electrical and Electronic Equipment Assemblers (SOC 51-2022)**: Assemble or modify electrical or electronic equipment, such as computers, test equipment telemetering systems, electric motors, and batteries.

*Entry-Level Educational Requirement:* *High School Diploma or Equivalent*

*Training Requirement:* *Moderate-term on-the-job training*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 30%

# Occupational Demand

**Table 1. Employment Outlook for Transit Electrical Technology Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2016 Jobs | 2021 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr | Annual | 10% | Median |
| Openings | | Hourly Wage | |
| Electric Motor, Power Tool & Related Repairers | 454 | 477 | 23 | 5% | 242 | 48 | $14.41 | $22.82 |
| Electrical & Electronics Installers & Repairers, Transportation Equipment | 659 | 672 | 13 | 2% | 302 | 60 | $25.53 | $38.54 |
| Electrical and Electronics Repairers, Commercial & Industrial Equipment | 1,858 | 1,939 | 81 | 4% | 896 | 179 | $16.79 | $32.09 |
| Electrical & Electronics Repairers, Powerhouse, Substation & Relay | 244 | 271 | 27 | 11% | 140 | 28 | $33.33 | $43.88 |
| Electrical & Electronic Equipment Assemblers | 13,051 | 13,068 | 17 | 0% | 7,926 | 1,585 | $11.30 | $16.78 |
| **Total** | **16,267** | **16,428** | **161** | **1%** | **9,505** | **1,901** | **$12.92** | **$19.99** |

*Source: EMSI 2017.4***Bay Region** includes Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties

**Table 2. Employment Outlook for Transit Electrical Technology Occupations in East Bay Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2016 Jobs | 2021 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr | Annual | 10% | Median |
| Openings | | Hourly Wage | |
| Electric Motor, Power Tool & Related Repairers | 257 | 274 | 17 | 7% | 140 | 28 | $13.18 | $24.02 |
| Electrical & Electronics Installers & Repairers, Transportation Equipment | 375 | 379 | 4 | 1% | 167 | 33 | $25.76 | $38.42 |
| Electrical and Electronics Repairers, Commercial & Industrial Equipment | 591 | 618 | 27 | 5% | 287 | 57 | $22.41 | $37.59 |
| Electrical & Electronics Repairers, Powerhouse, Substation & Relay | 113 | 120 | 7 | 6% | 58 | 12 | $35.27 | $43.64 |
| Electrical & Electronic Equipment Assemblers | 2,543 | 2,622 | 79 | 3% | 1,580 | 316 | $11.01 | $15.91 |
| **Total** | **3,878** | **4,014** | **136** | **4%** | **2,231** | **446** | **$15.02** | **$22.73** |

*Source: EMSI 2017.4***East Bay Sub-Region** includes Alameda and Contra Costa counties

### Job Postings in Bay Region and East Bay Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (Dec. 2016 – Nov. 2017)**

|  |  |  |
| --- | --- | --- |
| Occupation | Bay Region | East Bay |
| Electrical and Electronic Equipment Assemblers (51-2022.00) | 333 | 109 |
| Electric Motor, Power Tool, and Related Repairers (49-2092.00) | 108 | 42 |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment (49-2094.00) | 69 | 22 |
| Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095.00) | 9 | 9 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment (49-2093.00) | 4 | 1 |
| **Total** | **523** | **183** |

*Source: Burning Glass*

**Additional Evidence of Employer Demand**

LMC’s flagship Career Technical Education (CTE) program, Electrical and Instrumentation Technology (ETEC), was designed primarily to serve the workforce needs of local advanced manufacturing and in particular the petrochemical industry as well as steel manufacturing and water/wastewater treatment and supply. Embedded in the program are electrical and electronics courses that suit the needs of mass transit agencies such as Bay Area Rapid Transit (BART), Golden Gate Transit, AC Transit, SAM Trans, SFMTA, and VTA. After a detailed review by transit electrical maintenance officials from BART, 25 of the 42 units that make up the ETEC Certificate of Achievement were selected that would meet the needs of the transit industry.

**Table 4. Top Job Titles for Transit Electrical Technology Occupations for latest 12 months (Dec. 2016 – Nov. 2017)**

|  |  |  |
| --- | --- | --- |
| Common Title | Bay Region | East Bay |
| Mechanical Assembler | 156 | 41 |
| Electrical Technician | 87 | 34 |
| Electronic Assembler | 48 | 23 |
| Electro-Mechanical Assembler | 34 | 21 |
| Electrical Assembler | 23 | 7 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Transit Electrical Technology Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 3 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry | | % Change (2016-21) | % in Industry (2016) |
| (2016) | (2021) |
| Computer and Electronic Product Manufacturing (334) | 11,013 | 10,762 | (2%) | 67.6% |
| Electrical Equipment, Appliance & Component Manufacturing (335) | 1,004 | 1,136 | 13% | 6.2% |
| Merchant Wholesalers, Durable Goods (423) | 705 | 753 | 7% | 4.3% |
| Administrative and Support Services (561) | 481 | 544 | 13% | 3.0% |
| Local Government (903) | 464 | 486 | 5% | 2.8% |
| Machinery Manufacturing (333) | 428 | 446 | 4% | 2.7% |
| Professional, Scientific, and Technical Services (541) | 398 | 460 | 16% | 2.4% |
| Repair and Maintenance (811) | 348 | 343 | (1%) | 2.1% |
| Specialty Trade Contractors (238) | 207 | 234 | 13% | 1.3% |
| Miscellaneous Manufacturing (339) | 183 | 179 | (2%) | 1.1% |
| Federal Government (901) | 161 | 158 | (2%) | 1.0% |
| Transportation Equipment Manufacturing (336) | 131 | 125 | (5%) | 0.8% |
| Rail Transportation (482) | 26 | 27 | 4% | 0.2% |

*Source: EMSI 2017.4*

**Table 6. Top Employers Posting Jobs in Bay Region and East Bay for latest 12 months (Dec. 2016 – Nov. 2017)**

Note: 61% of records have been excluded because they do not include an employer. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Employer** | **Bay Region** | **East Bay** |  | **Employer** | **Bay Region** | **East Bay** | |
| National Guard | 10 | 5 |  | US Army Reserve | 6 | 0 | |
| Sanmina Corporation | 9 | 5 |  | Complete Coach Works | 4 | 4 | |
| Eaton | 8 | 8 |  | Ul Llc | 4 | 4 | |
| Northrop Grumman | 6 | 0 |  |  |  | |  |

*Source: Burning Glass*

# Educational Supply

On the supply side, there are 9 Community Colleges issuing 189 awards annually on TOP 0934 - Electronics and Electric Technology. It is important to note that here are a variety of programs on this TOP code that are supplying students for the occupations profiled in this report, and many students may be entering industries outside the transit/transportation sector. See Table 5 on page 3 for other industries that employ graduates from Electronics and Electric Technology programs.

**Table 7. Award on 0934.00 Electronics and Electric Technology in Bay Region and on CIP 47.0101 Electrical/Electronics Equipment Installation and Repair, General**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | CC Headcount | Associate Degrees | Certificates or Other Credit Awards | Total Awards |
| Chabot | East Bay | 181 | 4 | 10 | 14 |
| Contra Costa | East Bay | 44 | 0 | 4 | 4 |
| Diablo Valley | East Bay | 281 | 9 | 17 | 26 |
| Laney | East Bay | n<10 or on another TOP | 9 | 24 | 33 |
| Los Medanos | East Bay | 216 | 14 | 20 | 34 |
| Marin | North Bay | 18 | 0 | 0 | 0 |
| San Francisco | Mid-Peninsula | 98 | 2 | 11 | 13 |
| San Mateo | Mid-Peninsula | 171 | 0 | 43 | 43 |
| Santa Rosa | North Bay | 191 | 5 | 11 | 16 |
| Skyline | Mid-Peninsula | 79 | 0 | 6 | 6 |
| CET Sobrato | Silicon Valley | n/a | 0 | 35 | 35 |
| **Total Bay Region** | | **1,278** | **43** | **181** | **224** |
| **Total East Bay Sub-Region** | | **723** | **36** | **75** | **111** |

# *Source: IPEDS, Data Mart and Launchboard*

NOTE: Headcount of students who took one or more courses is for 2015-16. For Community Colleges, the annual average for Associate Degrees and Certificates is 2014-17. The annual average is 2013-16 for CET Sobrato (who had no awards listed in IPEDS for the most current year 2016).

# Gap Analysis

It is difficult to determine the labor market gap for Transit Electrical Technology occupations since the SOC codes selected appear to be spread across a variety of industry sectors (see table 5 on page 3). However, even if only 15% of the annual openings for these occupations are related to the transit/transportation sector, there would still be an undersupply in the Bay region. 15% of the 1,900 annual openings would be about 285 annual openings compared to 224 annual awards for an undersupply of about 60. However, in the East Bay, there would need to be 25% or higher of the annual openings in those occupations in the transit/transportation sector for there to be a labor market gap, since 25% of the 446 annual openings would be about 112 annual openings compared to 111 annual awards.

# Student Outcomes

Overall, students who took courses on TOP code 0934.00 at Los Medanos College and in the Bay region are getting employed at a higher rate than those students at the state level taking courses on the same TOP code. For students in the East Bay and at Los Medanos, percentage employed, wages, and percentage earning a living wage are higher than for students in other colleges in the region. The following is a summary of the employment and earnings data presented in Table 8:

* The percentage of students who took courses on TOP code 0934.00 who are employed four quarters after exit in 2014-15 is 85% for College of San Mateo and Los Medanos, which is higher than the regional median at 79% and the state median at 69%.
* The top college in the region for quarterly earnings is San Francisco at $26,255 which is much higher than the regional median by 111%.
* The percentage of students who took courses on this TOP code in the East Bay who are earning a living wage is higher than the region by 7% and higher than the state by 18%.

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0934.00 - Electronics and Electric Technology at Bay Region Colleges**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2014-15** | **Bay Region (All Programs)** | **State (0934.00)** | **Bay Region (0934.00)** | **East Bay Sub-Region (0934.00)** | **Los Medanos (0934.00)** | **Top College in Bay Region (0934.00)** | |
| % Employed Four Quarters After Exit | 68% | 69% | 79% | 80% | 85% | Los Medanos San Mateo | 85% |
| Median Earnings Two Quarters After Exit | $12,640 | $8,930 | $12,460 | $13,375 | $14,065 | San Francisco | $26,255 |
| Median % Change in Earnings | 37% | 38% | 36% | 50% | 131% | Los Medanos | 131% |
| % of Students Earning a Living Wage | 51% | 56% | 67% | 74% | 73% | Diablo Valley | 79% |

*Source: Launchboard*

# Skill & Certifications

**Table 9. Top Skills and Certifications for Transit Electrical Technology Occupations in the Bay Region**

Note: 94% of records have been excluded because they do not include a certification. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skill** | **Latest 12 Mos. Postings** | **Skill** | **Latest 12 Mos. Postings** | **Certifications** | **Latest 12 Mos. Postings** |
| Mechanical Assembly | 162 | Microscope | 42 | Electrician Certification | 7 |
| Repair | 153 | Power Tools | 39 |
| Soldering | 121 | Labeling | 35 | Security Clearance | 7 |
| Hand Tools | 120 | Power Supplies | 29 |
| Schematic Diagrams | 96 | Cleaning | 27 | Professional Engineer | 4 |
| Wiring | 96 | Electrical Work | 27 |
| Inspection | 79 | Calipers | 25 | Soldering Certification (e.g. IPC Certification) | 4 |
| Electromechanical Assemblies | 70 | Electrical Systems | 25 |
| Test Equipment | 60 | Equipment Repair | 25 |

*Source: Burning Glass*

**Table 10. Education Requirements in Bay Region**

Note: 61% of records have been excluded because they do not include a degree level. As a result, the chart below may not be representative of the full sample.

|  |  |
| --- | --- |
| **Education (minimum advertised)** | **Latest 12 Mos. Postings** |
| High school or vocational training | 176 |
| Associate Degree | 15 |
| Bachelor’s Degree | 12 |

*Source: Burning Glass*

# Methodology

Occupations for this report were identified by use of skills listed in O\*Net descriptions and job descriptions in Burning Glass. Labor demand data is sourced from Economic Modeling Specialists International (EMSI) occupation data and Burning Glass job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CTE Launchboard and CCCCO Data Mart.

# Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard [www.calpassplus.org/Launchboard/](http://www.calpassplus.org/Launchboard/)

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset

Living Insight Center for Community Economic Development

Chancellor’s Office MIS system

# Contacts

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