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**Geographic Information Systems Program Report
For Greater South Bay and Peninsula Region
(Santa Clara and San Mateo Counties)**

Geographic Information Science and Cartography

CIP 2010: A program that focuses on the systematic study of map-making and the application of mathematical, computer, and other techniques to the analysis of large amounts of geographic data and the science of mapping geographic information. Includes instruction in cartographic theory and map projections, computer-assisted cartography, geographic information systems, map design and layout, photogrammetry, air photo interpretation, remote sensing, spatial analysis, geodesy, cartographic editing, and applications to specific industrial, commercial, research, and governmental mapping problems.

Target Occupations‡

Cartographers and Photogrammetrists (17-1021)

Surveying and Mapping Technicians (17-3031)

‡Based on EMSI crosswalk of the Classification of Instructional Programs (CIP) codes with Standard Occupational Classification (SOC) codes as published by the U.S. Department of Education.

In 2012, the number of geographic information system (geographic information science and cartography) jobs in the target occupations in Santa Clara and San Mateo Counties totaled 292. The Bureau of Labor Statistics (BLS) expects the total number of positions to increase by 7.4% over the next three years. Regional openings in 2012, which included created jobs and turnover, totaled 24. There were no completions in regional geographic information system programs, but there were 51 completions from other related programs. These other programs are linked to multiple occupations and not all those who complete will enter the target occupations indicated in this report.

Target Occupation Performance

292* Jobs (2012) National Location Quotient: 0.53 [†]	7.4%* Growth (2013-2016) National: 2.2%	\$28.40/hr Median Earnings National: \$20.76/hr
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*Based on total number of jobs for target occupations Santa Clara and San Mateo Counties.

[†]Represents occupation density as compared to national average (national average=1).

Regional Openings (2012)	24
Regional Program Completions (2012)	0
All Regional Completions for Target Occupations (2012)	51

**Openings include created jobs and turnover.

^{††}Includes all regional programs applicable to target occupations.

Geographic Information Systems Occupations Performance

Target Occupations	Regional Openings (2012)	Average Hourly Earnings	Growth (2013-2016)
Cartographers and Photogrammetrists (17-1021)	9	\$30.71	11.6%
Surveying and Mapping Technicians (17-3031)	16	\$31.38	6.1%

Regional Breakdown for Geographic Information Systems Occupations

County Name	2013 Jobs	2016 Jobs	2013 Annual Openings	Median Hourly Earnings	2013 National Location Quotient
Santa Clara	270	289	11	\$26.67	0.66
San Mateo	41	45	2	\$39.68	0.26
Total	310	333	13	\$28.40	

Other regional programs may train individuals eligible for the targeted geographic information system occupations, which are based on an occupation-program crosswalk developed by the Department of Education. These additional programs are offered at Evergreen Valley College, College of San Mateo, and International Technological University. As noted earlier, many postsecondary programs are linked to multiple occupations and not all those who complete the program will enter the target occupation.

Regional Geographic Information Systems Training Programs

2 Programs (2012)	51 Completions (2012)
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Program	2008	2009	2010	2011	2012
Engineering Technology, General (15.0000)	4	3	1	0	49
Surveying Technology/Surveying (15.1102)	0	0	2	4	2

Target Occupations Demographics

The demographics among those employed in geographic information system technology occupations in Santa Clara and San Mateo Counties for 2013 show the majority men (81.7%) and over two-thirds are over the age of 35 (68.5%).

Gender Demographics (Regional)

Gender	Jobs (2013)	% of Total	
Male	254	81.7%	
Female	57	18.3%	

Age Demographics (Regional)

Age	Jobs (2013)	% of Total	
14-18 Years	<10	0.7%	
19-21 Years	<10	1.8%	
22-24 Years	15	4.9%	
25-34 Years	75	24.1%	
35-44 Years	81	26.1%	
45-54 Years	78	25.2%	
55-64 Years	45	14.5%	
65+ Years	<10	2.7%	

Industries Employing Geographic Information Systems Occupations

A number of industries in Santa Clara and San Mateo Counties employ those trained in geographic information systems and its related occupations. The following table represents a regional industry breakdown of the number of geographic information system positions employed, the percentage of geographic information system jobs employed by industry and the percentage geographic information system jobs represent within all jobs by each industry. While engineering services employed 24.5% of all regional geographic information system positions in 2013, geographic information systems and its related occupations represent only 0.8% of the total jobs in that industry.

Inverse Staffing Patterns(Regional)

Top Five Industries	Occupation Group Jobs in Industry (2013)	% of Occupation Group in Industry (2013)	% of Total Jobs in Industry (2013)
Engineering Services (541330)	76	24.5%	0.8%
Architectural Services (541310)	56	18.0%	3.8%
Local Government, Excluding Education and Hospitals (903999)	39	12.5%	0.1%
Surveying and Mapping (except Geophysical) Services (541370)	27	8.7%	4.3%
Electronic Computer Manufacturing (334111)	24	7.6%	0.1%

Data Sources and Calculations

State Data Sources

This report uses state data from the following agencies: California Labor Market Information Department

Institution Data

The institution data in this report is taken directly from the national IPEDS database published by the U.S. Department of Education's National Center for Education Statistics.

Completers Data

The completers data in this report is taken directly from the national IPEDS database published by the U.S. Department of Education's National Center for Education Statistics.

Occupation Data

EMSI occupation employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level EMSI earnings by industry.

Staffing Patterns Data

The staffing pattern data in this report are compiled from several sources using a specialized process. For QCEW and Non-QCEW Employees classes of worker, sources include Occupational Employment Statistics, the National Industry-Occupation Employment Matrix, and the American Community Survey. For the Self-Employed and Extended Proprietors classes of worker, the primary source is the American Community Survey, with a small amount of information from Occupational Employment Statistics.

Industry Data

EMSI industry data have various sources depending on the class of worker. (1) For QCEW Employees, EMSI primarily uses the QCEW (Quarterly Census of Employment and Wages), with supplemental estimates from County Business Patterns and Current Employment Statistics. (2) Non-QCEW employees data are based on a number of sources including QCEW, Current Employment Statistics, County Business Patterns, BEA State and Local Personal Income reports, the National Industry-Occupation Employment Matrix (NIOEM), the American Community Survey, and Railroad Retirement Board statistics. (3) Self-Employed and Extended Proprietor classes of worker data are primarily based on the American Community Survey, Nonemployer Statistics, and BEA State and Local Personal Income Reports. Projections for QCEW and Non-QCEW Employees are informed by NIOEM and long-term industry projections published by individual states.