

CRB

The Careers Project

A Summary with Policy Options

*By Patricia L. de Cos,
Julie Chan,
and Katharine Salling*

*At the Request of Senator Roy Ashburn,
Senator Loni Hancock,
Assemblymember Lori Saldaña,
Assemblymember Tom Torlakson,
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California Research Bureau
900 N Street, Suite 300
P.O. Box 942837
Sacramento, CA 94237-0001
(916) 653-7843 phone
(916) 654-5829 fax

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Internet Access

This report is part of a series of Careers Project reports that are available through the Internet on the California State Library's home page under CRB Reports (www.library.ca.gov/crb). Other Careers Project reports include:

- *The Careers Project: School Survey of Middle and High School Principals and Counselors in California*
- *The Careers Project: An Economic Analysis of Ten Industry Clusters in California*
- *The Careers Project: Survey of Representatives of Business and Industry in California*
- *The Careers Project: Focus Group Perspectives on Provisions for Career Exploration and Development Opportunities at Selected Middle and High Schools*

Executive Summary

The Careers Project is a study of the preparation all students in public middle and high schools receive to explore career options and the relationship between that preparation and California's state and regional economies. The California Research Bureau (CRB) undertook this research at the request of a bipartisan group of members of the California Legislature, with funding support from the James Irvine Foundation. The following provides the rationale for this study as expressed by a letter of a bipartisan group of legislators and the CRB commitment to the James Irvine Foundation for the grant support of the Careers Project.

As one of the largest economies of the world, California's economy is comprised of many industry sectors and occupations. Many of these industries are in the midst of transformation, adapting to changing technologies, while others are expanding more than others – or growing more rapidly than others. Maintaining California's competitive edge will depend in part on ensuring that all students who are currently in middle and high schools explore various career alternatives and understand the nature of California's overall economy as well as the regional economies. While California law requires local governing boards of schools serving students in grades seven to 12 to offer a course of study that provides an opportunity to attain entry-level employment skills in business or industry, it is not known how well schools are serving these students. Their obligation is to *all* students, including students who excel academically and are considered “college-bound,” students who are considered at high risk for dropping out of school, and students who complete a high school course of study. Learning about California's industries and the diverse occupations contained therein is important to the lives of all types of students. This study will test the hypothesis that for the majority of students, little is done to prepare them for life after school or to understand the connection between their schooling and the world of careers. This study proposes to provide baseline information to policymakers about the range of activities that middle and high schools in California offer all students, and to highlight a sampling of best practice models.

A number of studies point to the importance of providing a connection between what is learned in the classroom and its applicability to future career pursuits as a means of keeping students engaged in school and not dropping out prior to completing grade 12. However, there is no comprehensive data collected that informs California policymakers about how schools do (or do not) provide this connection. This study proposes to determine the extent to which all middle and high school students understand their potential role in contributing to and benefiting from California's economy, and how that affects their current and future course of study.

California's economy and society has changed in the past fifty years. No longer is it a question of whether young people will enter the workforce, but *when* and in *what* capacity. Recent studies have shown that many students are leaving the K-12 public schools before they graduate. Currently, no data are collected that document whether all students, including those dropping out, have been exposed to career exploration and development activities. This study proposes to examine the degree to which schools serving middle and high school students provide all students with the necessary tools for career exploration and development so that students can take charge of their future and proactively set a course of study or training to achieve their career options.

Finally, workers in the new economy may have up to fifty years to realize one or more careers, which is a significantly longer work life than in the past. It is unclear whether middle and high school students are aware of and understand the possible changes in the nature of employment and the need to be flexible. This study intends to identify ways that some schools have provided middle and high school students with the skills to manage their future career aspirations before leaving the K-12 school system.

The study consisted of three distinct phases, including:

1. A statewide survey of middle and high school counselors and principals.
2. An economic analysis and survey of representatives of business and industry in California.
3. School focus groups.

In each of the three study phases, the CRB research team utilized the nine economic regions defined by the California Economic Strategy Panel of the California Labor and Workforce Development Agency as a framework for capturing the diversity of the state.*

* Please refer to Appendix 1 for a map describing the nine economic regions.

Policy Options for Consideration

The Careers Project has been an ambitious undertaking to gather information from a variety of sources and provide some cohesion for that information. The findings of school surveys of middle and high school principals and counselors alone have provided much new information to the policy conversation about the level of resources that are available to middle and high school students across the state for career exploration and development. The focus group study phase helped the CRB research team to develop a deeper understanding of the broader trends found in the school survey data and the differences that exist among schools even though “on paper” they may appear to offer the same career development services to students. By listening to students, parents and school staff, the CRB research team found that career development services were often not available to all students, but only to those who had either sought out the services by self-selection or initiative or who had the good fortune of having a teacher that provided those connections to students through curriculum or career-related activities. By surveying the world of business and industry, we have gained insight to their views regarding the adequacy of existing educational programs to prepare high school students for employment, the occupations and related job skills that businesses and industries need, and emerging trends facing selected industry sectors in California.

Since we embarked on this project, the economy in California, as in the rest of the nation and world, has taken a severe downturn, making the findings of this study more critical to the state’s economic recovery, both in terms of how students make connections between their current course of study and their career options and how employers find workers with the necessary skills to remain competitive in the global economy. Given our difficult economic times, it is equally important today to assist students to pursue their dreams and find gainful employment as it is when the economy is doing well. For these reasons, it is incumbent on government to identify policy alternatives that do not necessarily require additional resources, but rather find ways to partner together with other governmental or private entities to achieve shared goals as well as possibly shifting funding priorities using existing resources.

Numerous important issues have been identified in the three phases of the study. Some are local in nature; and the state does not have jurisdiction whether school districts, individual schools, associations, or individual firms adopt the suggestions contained herein. However, there are a number of issues that could be addressed by the Legislature and Governor, including:

- Lack of Counseling Staff. We found that about 20 percent of schools in the school survey sample did not have a school counselor. While the state has recently invested funds to supplement middle and high school counseling programs under Assembly Bill 1802, the resources have not reached all schools. Even in schools where there are school counselors, only 70 percent of counselors and 60 percent of principals indicated that school counselors provide career guidance to students *in addition to*

academic and personal/social issues. Reports from school counselors participating in our focus groups suggested that career development counseling is not a priority at their schools. If school counselors are one resource at schools with a background in career development (other than staff with credentials in career technical education), shouldn't more of their time be devoted to this important function, especially since such career guidance could provide the necessary "hook" to engage at-risk students and give direction to academically achieving students who may lack this direction?

- Lack of Staff and Resources to Support Career Exploration and Development. We found that slightly more than half of the principals and counselors provide career development to all students and three-quarters of employers are partnering with schools. A lack of staff does not appear to be problematic for those schools or employers that are engaged in school-business partnerships. However, we found that schools and employers cited "lack of staff" as the primary reason for not providing career development services to students (in schools) and for not establishing a school-business partnership (in schools and businesses).

How is it that some schools or employers find the resources to engage in providing career development to students while others cannot? We believe that established priorities at individual schools and school districts may provide us some understanding of the underlying issues. For example, Education Code § 51228 (b) requires local school boards serving students in grades seven through 12 to offer a course of study that provides students an opportunity to attain entry-level employment skills in business or industry upon graduation from high school. Schools whose principals and counselors interpreted their local school boards' views of the law as only including the provision of basic academic skills proficiency (i.e., reading, writing, and mathematics) were the least likely to provide career development to all students or to have established a partnership with local businesses or community organizations. In contrast, principals and counselors who interpreted their local school boards' views as either requiring the provision of: 1) career technical education programs (CTE) or career awareness, exploration, or orientation, or 2) a combination of the three interpretations presented to them (CTE programs, career awareness, and basic skills) were the most likely to provide career development to all students at their schools and to establish partnerships with local businesses or industries. During the focus group study phase, participants told us that the intent of Education Code § 51228 (b) is vague and open to multiple interpretations. Without more specific clarification regarding the intent of this state law and accompanying resources to carry it out, many schools view it as an unfunded mandate and do not implement it.

While it would be important to provide resources at schools for career exploration or development opportunities to all students, it should not be confined to a staff person or set apart from the rest of the school's functions as another add-on function. Rather it should be designed as an integrated mechanism that is incorporated into the curriculum for all faculty, counselors, and administration to embrace as part of their overall school culture.

In better economic times or by shifting funding priorities within existing resources, the Legislature may consider funding schools to:

- Infuse developmentally appropriate career exploration and development in all standards and frameworks as part of the skills and knowledge required for adult life (such as “life skills” or “personal finance” preparation) in mathematics, English-language arts, history-social studies, and science as a way to facilitate teachers’ ability to embed these concepts in their curriculum throughout the year. This would require the California Department of Education (CDE) to conduct an analysis of the appropriateness of introducing career-oriented concepts at different grade levels and for the different subject matters. Such analysis would need to be incorporated into the six-year cycle of frameworks revisions.

The rapid and continual changes in technology might be used to shape how career-oriented information is presented in the frameworks. This information would be helpful to inform school faculty and administrators about new ways to teach and for students to learn, modeling these methods after innovative business practices. Business partnerships could assist in these efforts, by demonstrating to students the relevancy of their coursework to different occupations and industries.

- Provide for a career exploratory class for all students in two grade levels, at both middle and high schools. Such a class could be a semester- or year-long in duration, and expose students to information regarding the state and their regional economies, including job outlooks, educational requirements, salaries, and working conditions for various occupations. Career exploratory classes would address employers concerns that students understand the connection between their current course of study and their future aspirations as well as to be exposed to the variety of industries that exist in the state.
- Provide students and their parents a better foundation to determine students’ interest in pursuing educational program offerings, at students’ assigned (home) high school or at another school of their choice, by requiring school districts to provide students and their parents with information detailing the various educational programs offered at high schools and other alternative schools in their districts. Information about high schools should include the prescribed separate courses of study that prepare prospective students for admission to state colleges and universities and courses for career technical education, as required by state law (Education Code § 51224). This law, coupled with the admission requirements established by the University of California and the California State University, requires students to choose between the separate courses of study offered at high schools. This raises a couple of policy questions:
 - Are students and parents aware and do they understand the choices available to them?
 - Is it the intent of the Legislature and the Governor to maintain a separate course of study for high school students?

This dichotomy reflects the opinions expressed by half of the responding employers as to why they do not believe that existing educational programs adequately prepare high school students for employment in their industries. For those employers who stated that their recruitment efforts are focused on students graduating from postsecondary education institutions, the question is how do middle and high school students become aware of and begin preparing for the diversity of jobs that may require postsecondary education or training?

For other employers who indicated that existing education programs inadequately prepare high school students for employment in their industries because of a lack of CTE programs in high schools, it may be a result of limited CTE offerings or the fact that students and their parents may not be aware of the CTE programs available to them in schools throughout their districts.

- What Works? We found that half of the responding principals and counselors in the school surveys reported that their schools had provided career development services to all students at their schools, including English learners and students with disabilities. However, only ten percent of respondents indicated that they had evaluated the effectiveness of these services. To gather consistent information regarding the effectiveness of career exploratory and development programs, the Legislature may wish to:
 - Commission a study using the California Longitudinal Pupil Achievement Data System (CALPADS) to learn how student enrollment in various courses of study affects student performance. For example, schools and school districts are currently preparing to submit information to CDE regarding students' first and second semester grades by course enrollments in the 2009-10 school year. Data from the Standardized Test and Achievement Tests (STAR) will also be integrated into CALPADS, beginning in 2009-10. Information currently being gathered by CALPADS could be used to examine student performance based on their course enrollment, both in terms of their grades and test scores as well as their persistence in school and graduation from high school.

However, the STAR testing only includes assessments of core courses (English-language arts, mathematics, science, and history-social science), and does not include other elective courses (such as career technical education, physical education, health, and others). Therefore, the state would be limited in learning about students' performance relative to students' elective course enrollments. Furthermore, since elective courses are not assessed on a statewide basis, they are also not included in the state (Academic Performance Index (API)) and the federal (Annual Yearly Progress (AYP) under the *No Child Left Behind Act of 2001*) accountability systems.

- Develop technical skills assessments for students enrolled in career technical education courses. As a requirement of the recently-adopted *2008-2012 California State Plan for Career Technical Education*, California is currently using teacher assessments to fulfill the federal requirement to demonstrate technical skill proficiency for students enrolled in career technical education

- courses. It may be in the state’s interest to develop technical skills assessments that are aligned with industry-recognized standards, where possible. This would require a commission to examine the feasibility of developing such assessments for particular program areas.
- Develop a longitudinal database, using information from CALPADS and data of enrollments in postsecondary education institutions, technical schools, apprenticeship programs, or other employment and training (using base-wage files from the Employment Development Department) to learn about students’ progress after leaving high school, based on the courses they had completed while enrolled in public schools in California. There would be some issues to resolve in terms of accessibility to the data, management of the data, maintaining confidentiality, and financing such an endeavor, but this may be worth exploring further with a commission of interested stakeholders.
 - Lack of Awareness of National, State Standards, Guidelines, and Laws. The school survey uncovered varying degrees of awareness of national and state standards, guidelines, and laws among responding principals and counselors. It appears that respondents’ awareness reflects their school districts’ and schools’ priorities. For example, large majorities of respondents were aware of AB 1802, which has provided funding for schools to assist students having difficulty passing the California High School Exit Examination. With the state’s emphasis on testing and accountability (the federal *No Child Left Behind Act of 2001* requires states to report on the number of students graduating each year as one measure of schools meeting AYP targets), it is not surprising that respondents were more aware of this funding program than other state or federal initiatives that are not germane to the state’s assessment and accountability conversation. With this logic, it follows that less than half of the respondents were aware of the state’s CTE model standards, SCANS, or SB 70.
 - Another policy question becomes, how can the state improve efforts to increase awareness among educators, business and industry, and other interested stakeholders? An existing resource available is the California Career Resource Network, which was established in state law to provide schools with free and low-cost career exploration resources (i.e., the free online California CareerZone, the free online California Reality Check, and the low-cost California Career Planning Guide).^{*} The state could establish a central clearinghouse for information using the state portal through the CDE’s website with links from the California State Senate and Assembly websites, the Governor’s Office website, and other state agencies and departments. Non-governmental entities have a responsibility to members of their associations to “get the word out” including school-related, workforce preparation, economic development, and business associations. In addition, this information could be made available through regional collaborative efforts.

^{*} For more information, visit the California Career Resource Network’s website at: www.CaliforniaCareers.info.

- Business Involvement. To encourage businesses that do not have the capacity to establish school-business partnerships, the Legislature may consider creating a tax incentive for employers to subsidize dedicated staff time for outreach activities and partnerships with public middle and high schools in the state. This would be particularly useful for the large majority of employers in the state that are small business (i.e., less than five employees). Given our current state budget challenges, such an option would further impact state revenues, so it would doubtlessly need to be part of a broader discussion about the priorities and goals of public education.
- Partnership Opportunities with Other Stakeholders. Schools and businesses should be part of a broader network of organizations pursuing ways for students to understand the connections between their current courses of study and their future careers and helping businesses and industries to guide schools on their needs (e.g., local chambers of commerce, industry or trade associations, workforce investment boards, economic development corporations, community colleges, state colleges and universities, county offices of education, adult schools, technical schools, apprenticeship programs, etc.). For example, the State Superintendent of Public Instruction (SSPI) may wish to collaborate with the Economic Strategy Panel (of the Labor and Workforce Development Agency) to have school districts and schools participate in the ongoing training sessions to learn more about state and regional economic information. The SSPI may wish to establish a partnership with the California Workforce Investment Board and the California Chamber of Commerce to:
 - Encourage school districts to provide professional development training for teachers and counselors, in coordination with local workforce investment boards or local chambers of commerce, to give them an overview of the state and their regional economies.
 - Encourage school districts to allow teachers and counselors to participate in a two-week summer or off-session internship with business or industry and grant them “continuing education credits” for maintaining their professional credentials.
- Partnership Opportunity with Labor Market Information. The school surveys revealed that less than half of the responding principals and counselors provide information about the state or regional economies to their students. School counselors credentialed in California have a background in career development (in addition to academic and personal/social). However, we found that this is not their primary function when hired by school districts. During the school focus group study phase, we found that information about the state or regional economies may be provided to students only on a limited basis.

The California Employment Development Department has within its Labor Market Information Division local labor market consultants assigned to each county in the state that could be enlisted to augment schools’ capacity to provide labor market information to all students. The Legislature may consider establishing “partnership” funding to local area consultants, whose expertise and focus on industry and employment data would make them a natural partner to collaborate with middle and high schools. They could make bi-annual visits (once each school semester) to

provide information related to changes in the state and their regional economies, opportunities for career options, job salaries, educational requirements, and working conditions.

School Survey Summary

In the first phase of the Careers Project, the CRB research team surveyed California middle and high school principals and counselors at 800 schools to identify:

- (1) The resources that are available to all middle and high school students to prepare them for career options, improve their employability, and orient them to California’s state and regional economies.
- (2) Ongoing local business and community partnerships that assist students to explore the “world of careers” (or conversely, the barriers that impede the creation or the continuity or such partnerships).

The CRB research team selected schools on a stratified random sample basis, and 64 percent of the principals and counselors responded. The statewide response rates for the school principal and counselor surveys were 60 percent and 69 percent, respectively. The respondents came from 612 schools that closely reflect the entire population of schools serving students in grades seven through 12 in California (4,507 schools), when analyzed by school type, location, and the percentages of non-White students.

We found that almost 20 percent of schools in our sample did not have a school counselor and two schools did not have a school principal.*

The school survey report highlights the most important findings drawn from survey responses provided by principals and counselors and focuses on key trends in different regions of the state and among schools serving middle and high school students. It is important to note that for the purpose of the principal and counselor surveys, career development was defined as including career orientation and exploration, and any other activity, program or tool that the respondents’ schools use to respond to Education Code § 51228 (b).†

The school survey report organizes the findings into five themes including:

- A description of the responding counselors and principals.
- The availability of school resources to orient students to potential career options in the state and regional economies.

* Even at schools with counselors, the CRB research team found during our follow-up telephone calls to schools that counselors and principals often served more than one school. However, we did not consistently document how many counselors or principals this applied to or how many schools they served.

† California law (Education Code § 51228 (b)) requires local governing boards of schools serving students in grades seven to 12 to offer a course of study that provides an opportunity to attain entry-level employment skills in business or industry upon graduation from high school.

- Ongoing local business or other community partnerships.
- Existing barriers for providing career development for all students.
- Best school practices and models.

A Description of Responding Counselors and Principals

About 90 percent of responding counselors received their school counseling credential in California, which requires that they have demonstrated expertise in the domains of academic, personal/social, and career development counseling. In addition, 60 percent of counselors possessed another type of credential, which included an array of teaching, administrative, or specialized credential or certificate to work with particular groups of students or subject areas (e.g., reading specialist, special education, bilingual education, vocational education, emergency credential, and others). Counselors generally had more years of professional work experience than principals.

The Availability of Middle and High School Resources for Career Development

Principals and counselors identified a variety of school resources available to students for career development. Summaries of their responses are described below.

- Awareness of National and State Standards, Guidelines and Laws. Principals and counselors reported varying degrees of awareness of national and state standards, guidelines, and laws that might affect the availability of career development services for students. An overwhelming majority of both groups were familiar with the national standards for school counseling programs and the state’s new funding program for middle and high school counseling (Assembly Bill (AB) 1802). Of the respondents who had heard of and received AB 1802 funding, most respondents’ schools had changed the number of school counselors employed at their schools, extended school counseling services, and supplemented their career guidance programs.

However, less than half of the respondents were aware of the state’s career technical education standards (51 percent of principals and 36 percent of counselors) or the (national) Secretary’s Commission on Achieving Necessary Skills (SCANS) (44 percent of principals and 32 percent of counselors) foundation skills and competencies.*

* According to the State Board of Education’s CTE model standards report, “The California career technical education (CTE) model curriculum standards are organized in 15 industry sectors, or groupings, of interrelated occupations and broad industries. Each sector has two or more career pathways... A career pathway is a coherent sequence of rigorous academic and technical courses that allows students to apply academics and develop technical skills in a curricular area. Career pathways prepare students for successful completion of state academic and technical standards and more advanced postsecondary course work related to the career in which they are interested.” For more information, visit: <http://www.cde.ca.gov/be/st/ss/documents/ctestandards.doc>.

Only about 20 percent of the survey respondents were aware of Senate Bill (SB) 70 funding program (23 percent of principals and 16 percent of counselors), which enables community colleges to establish partnerships with middle and high schools.

- Curriculum Development for Career Development. Career development curriculum is an important avenue to present students with information about the economy, at both the regional and statewide levels, and about possible careers and their educational requirements. Only about half of all responding principals and counselors reported offering a curriculum for career development to the students at their schools. When examined by school type, about 70 percent of high school principals and counselors reported that their schools offered a career development curriculum.

When asked if they or other staff at their schools had developed a curriculum for career development, less than half of the respondents affirmed this. Of the respondents whose school staff had not developed such a curriculum, less than 20 percent cited another source for developing career development curriculum (i.e., a district superintendent or district curriculum specialist).

- Provision of Career Development Services. A large majority of the respondents (with a higher proportion of counselors (71 percent) than principals (61 percent)) reported that their school counseling staff had provided career guidance *in addition to* academic or personal/social counseling.

Only about half of the respondents agreed that career development services were provided to *all* students at their schools, including English learners and students with disabilities in a regular school year. About ten percent of the respondents reported using assessment instruments to evaluate the effectiveness of their career development activities, programs, or tools.

- Master School Schedule. The survey also probed the respondents about the type of master school schedule used at their schools (i.e., traditional or block periods) to determine whether this had an impact on their ability to provide *all* students with career development services. We found that the type of master schedule used was not an important factor affecting the provision of career development services.
- Local School Board Views. The survey queried respondents about their local school boards' views on the state requirements regarding career education, as specified in Education Code § 51228 (b). The survey offered three likely interpretations from which the respondents could choose (i.e., providing basic skills, providing career technical education programs, or providing career awareness, exploration, or orientation). Respondents who believed that providing basic skills reflected their

The SCANS competencies are the skills necessary for success in the work place and are organized into the following five areas: resources, information, interpersonal, systems, and technology. The SCANS foundations are skills and qualities that underlie the competencies in the areas of basic skills, thinking skills, and personal qualities.

local school boards' view of the California law were the least likely to provide career development to *all* students or to develop partnerships with local business or industry. In contrast, the principals and counselors who thought that their local school boards interpreted the law as requiring CTE programs, career awareness, or all three views presented were the most likely to provide career development to *all* students at their schools and to establish partnerships with local business or industry.

- Parental Involvement. About half of the responding principals and counselors reported involving parents in their children's career development at their schools.
- Information about California's Overall or Regional Economies. Less than half of the responding principals and counselors reported providing information about the state or their regional economies to students at their schools.

Local Business or Other Community Partnerships

Less than half of the respondents were involved in partnerships with community colleges or local business or industry groups, and even fewer reported other types of local partnerships that might assist students with career development. High school principals and counselors were the most likely to have established a community partnership of some kind among all school types. Of the respondents who had established a community partnership, about 20 percent had evaluated the effectiveness of their partnerships.

Existing Barriers for Providing Career Development to All Students

Respondents were given an opportunity on the surveys to identify barriers that prevented their schools from providing career development to *all* students or establishing community partnerships for career development. "Lack of staff" was the chief reason given for an inability to provide for career development for all students. Notably, respondents also reported that the school day as defined by local collective bargaining agreements prevented staff from working with business or community groups after school hours. Student lack of interest was the least-cited reason for not establishing business and local community partnerships.

Best School Practices and Models

The final section of the school survey report catalogues the variety of career development services offered at schools of the responding principals and counselors, and identifies several "model" programs at middle and high schools.* The CRB research team selected the model school programs based on the breadth and extent of their school-based career development activities, programs, or tools and on the community partnerships they had established with their local community colleges, business or industry groups, or other local community organizations.

* Please refer to Appendix 2 for a listing of activities, programs, and tools used by the schools responding to the school surveys and a sampling of best practice models.

A Recap of the School Survey Findings

We can draw several important conclusions from the responses of principals and counselors who participated in the school survey and represented schools of students enrolled in grades seven through 12. In particular,

- There are limited resources available to all students in grades seven through 12 for career development. Responding principals and counselors reported varying degrees of awareness of specific national and state standards, guidelines, and laws. It appears that respondents' awareness may reflect the priorities of their school districts and schools. For example, large majorities of respondents were aware of AB 1802, which has provided funding for schools to assist students having difficulty passing the California High School Exit Examination. With the state's emphasis on testing and accountability (the federal *No Child Left Behind Act of 2001* requires states to report on the number of students graduating each year as one measure of meeting their Annual Yearly Progress), it is not surprising that respondents were more aware of this funding program than other state or federal initiatives that are not germane to the state's assessment and accountability conversation. With this logic, it follows that less than half of the respondents were aware of the state's CTE model standards, SCANS, or SB 70.

The fact that about half of the respondents reported that their schools offered a curriculum for career development, less than half had developed such a curriculum, and about half had provided career development to all students indicates that providing career development information for all students regarding the various careers and industries in the state is not a high priority for school districts and schools. This theme was reinforced by our findings of respondents' interpretations of their school boards' views regarding the requirements of Education Code § 51228 (b).

- Of the schools providing career development services, only ten percent had evaluated the effectiveness of their career development activities, programs or tools. Moreover, of the schools that had engaged with local businesses, about a fifth had evaluated the effectiveness of these partnerships.
- Schools that are not providing career development to all students or not engaging with entities in their local community (such as community colleges, local businesses or other community organizations) might if they had more staff.
- A final point is that both principals and counselors concurred that students are interested in receiving more career development information, since this was the least cited reason for not providing career development to all students.

Employer Survey Summary

In the employer report, we discuss the second phase of the study, which involved two parts: an economic analysis of ten industry clusters and a survey of representatives of business and industry. The CRB economic analysis was based on information provided in the base reports for each of the nine economic regions of the state as defined by the Economic Strategy Panel of the California Labor and Workforce Development Agency. Using labor market information projections through 2014 of the California Employment Development Department's Labor Market Information Division, our analysis identified: the fastest growing and largest occupations, their corresponding required job skills, and their average annual salaries for ten industry clusters.

The information gathered from the economic analysis was used as the basis for launching a survey of representatives of business and industry in four industry clusters including:

- Basic Information Services (including Telecommunications and Publishing)
- The Manufacturing Value Chain (including Logistics, Production, and Design)
- Health Science and Services
- Retail Trade

The survey's three main objectives were to:

1. Determine what involvement businesses have with their local public K-12 schools.
2. Verify government-collected information regarding the fastest growing and largest occupations in California through 2014 and their corresponding job skills.
3. Identify any emerging trends that may not be captured by the economic data currently available.

The CRB research team identified the two largest employing subsectors within each of the four industry clusters across the nine economic regions of the state, for a total of 25 industry subsectors, and then selected representatives of those industries to survey, by searching for California-based associations and receiving recommendations from various individuals.* We contacted 111 employer associations and sent them an electronic survey, which resulted in 75 responses. The employer survey responses are considered descriptive since the CRB research team used a targeted selection process.

Employers participating in the employer survey were either affiliated with an association, trade group, or represented their own firm. Of the respondents representing an

* For a list of the industry sectors included in the employer survey, please refer to Appendix 3.

association or trade group, 20 percent represented more than 500 companies and another 20 percent represented 101-500 companies. For those respondents representing their own firm, about 20 percent employed more than 500 employees.

Business Partnerships with Schools

Employers were first asked to provide their opinions regarding a state law requiring local school boards to offer a course of study to prepare middle and high school students for the opportunity to attain entry-level employment (Education Code § 51228 (b)). About half of the responding employers reported that existing educational programs are either inadequate or do not prepare high school students at all for employment in their industries. Forty percent of respondents thought that existing programs somewhat prepare, while only three percent thought that students were well prepared to work in their industries.

Business/Industry Views on How Well Educational Programs Prepare High School Students for Employment	
Response	Percent
Not preparing students at all	16%
Inadequately preparing students	31%
Somewhat preparing students	40%
Preparing students very well	3%
No Answer	8%
Don't Know	3%
Total	100%
Source: <i>Survey of Representatives of Business and Industry</i> , CRB, 2008; N=75.	

Several themes emerged from the comments that respondents offered to explain their opinions. These included:

- Students do not have the necessary skills to perform the work.
- The quality of education varies considerably among schools.
- While the nature of jobs has changed, the educational system has not.
- Some industries do not expect high school students to be prepared for entry-level positions because critical jobs require post-secondary education; other industries offer extensive entry-level training.
- Experiential learning (i.e., career technical education) is lacking in public schools because of a focus on theory.
- Students are not taught “why” they need to have basic skills nor are they exposed to important industries existing in California (i.e., health, agriculture, engineering, and architecture).

About three-fourths of the responding employers have some form of partnership with middle or high schools. Only three percent had worked with an intermediary organization to assist in partnering with public schools (such as a one-stop career center, local workforce investment board, chamber of commerce, local economic development agency, trade association, or county office of education). The most frequently cited type of school partnership involved participation in “career days” or as “class speakers.” Of the respondents who could recall how their business-school partnerships had initially formed, the majority evolved from philanthropic gestures.

The majority of respondents who had experience with a school partnership viewed their partnership as beneficial or very beneficial to their firms or the firms they represented. The two most cited benefits were:

- The opportunity to build good will and visibility in the community (80 percent).
- The opportunity to train potential future employees in the skills needed (64 percent).

The majority of respondents also believed that their partnerships with public schools were beneficial or very beneficial to students primarily because “students gain an understanding of the industry they may be interested in working in” and “they provide opportunities for students to explore their career interests.”

Respondents who felt that school partnerships were not beneficial at all or somewhat beneficial to their firms or to students stated the main reason was a lack of staff resources that restricts their ability “to work with students” and a lack of school staff to “provide sufficient assistance to support the program.”

For respondents who had not established a partnership with public middle or high schools, the three most prevailing barriers were:

- 1) The work is not suitable for middle and high school students, so employers must recruit from four-year universities (89 percent).
- 2) A lack of staff at firms to initiate the effort of working with schools to recruit students (78 percent).
- 3) A lack of information or interest (61 percent).

Some employers elaborated in more detail about existing barriers for partnering with schools:

- “I mention again the controversy that surrounds the meat industry. Animal rights activists raise tension levels and make schools fearful.”
- “Work is complicated [and] often requires licensing with special educational background. Mostly we just don’t think about reaching out to this age group.”

- “Asking members ... to volunteer more time to outside interests does not bring many volunteers. Some ... member employers have their own outreach to high schools.”
- “Frequently, the businesses associated with [our association] are one-person operations, perhaps contracting out specialties such as typesetting or graphics or editing. Those roles require professionals.”

California Government Data on Fastest Growing and Largest Occupations and Job Skills

The survey posed a series of questions about the CRB’s economic analysis of the fastest growing and largest occupations in California through 2014 and their related job skills. While the questions were tailored depending on the jobs and skills required for each industry, the *content* of the questions was identical.

Fastest Growing and Largest Occupations

A majority of the respondents agreed with the CRB’s list of the fastest growing and largest occupations in their industries. The survey then asked these respondents to identify the job classifications that would provide the most jobs, were the most critical for growth in their industry, and would experience the greatest labor shortages. The CRB research team found some commonality in their responses. For example,

- Employers in the Health Science and Services industry identified registered nurses, physicians, technical lab workers, pharmacy, and radiology jobs.
- In the area of Logistics, freight and truck drivers were identified in each category.
- In Manufacturing Production, maintenance and repair workers were identified.
- In Design, various types of engineers, architects, and technicians were identified.

A number of respondents identified job shortages in their industries. About two-thirds of those respondents agreed that job shortages were due to workers leaving the workforce and the inability of their industries to keep pace with replacements. About 60 percent indicated that workers do not have the necessary skills to perform the jobs. Their comments suggest that in some industries, individual efforts are actively addressing the issues related to job shortages.

Of the respondents who disagreed or did not know about “fastest growing or largest occupations” in the industries they represented, the survey prompted them to specify jobs that they would omit or add to the list. Their comments suggest that lists of jobs did not pertain to their industries, were not considered to be areas of growth, or were “title-based” rather than skills-based.

*Job Skills**

When presented with the CRB’s analysis of the top third most commonly identified job skills that corresponded to the fastest growing and largest occupations in their industries, the majority of respondents agreed with the analysis. In addition, they suggested other important job skills including basic reading, writing, math, and science as well as critical reasoning, computer skills, and interpersonal and team work skills. When asked whether entry-level workers possess the necessary skills to perform their jobs, about two-thirds of the respondents agreed that they do “sometimes” or “most of the time.” About 40 percent of employers agreed that there was one or more occupations in their firm or the firms they represented that would be suitable to hire or at least provide an internship opportunity for high school students.

More than 60 percent of employers agreed there are one or more ways for high school students or entry-level workers to enter and advance in their industries. Some employers suggested that “entry-level” employment in their industries meant a postsecondary education, while others pointed to specific ways that recent high school graduates could begin working in their industries such as job shadowing, internships, summer or part-time employment, apprenticeship, and on-the-job training. Some other specific examples include:

- “They can enter as clerks to the pharmacy. But anything further such as a technician or pharmacist, schooling is involved.” (Health Science and Services)
- “Students potentially could provide back office functions in physician offices; some do part-time medical assisting.” (Health Science and Services)
- “As a helper/packer.” (Manufacturing Value Chain – *Logistics*)
- “There are always openings for entry-level workers in the meat packing and processing business. In fact, due to the difficulty of the work, turnover is quite high.” (Manufacturing Value Chain – *Production*)
- “Starting at the bottom and working their way up!” (Manufacturing Value Chain – *Production*)
- “Field operations, packing operations, sales assistance operations.” (Manufacturing Value Chain – *Production*)
- “On-site training, but then go to an accredited college to learn the necessary tools to advance within the profession.” (Manufacturing Value Chain – *Design*)

* For each selected occupation, the CRB research team identified the corresponding job skills using information from O*Net of the U.S. Department of Labor’s Bureau of Labor Statistics. The CRB research team aggregated the job skills for each industry sector and identified the top third most commonly identified job skills. These were then used in the employer survey.

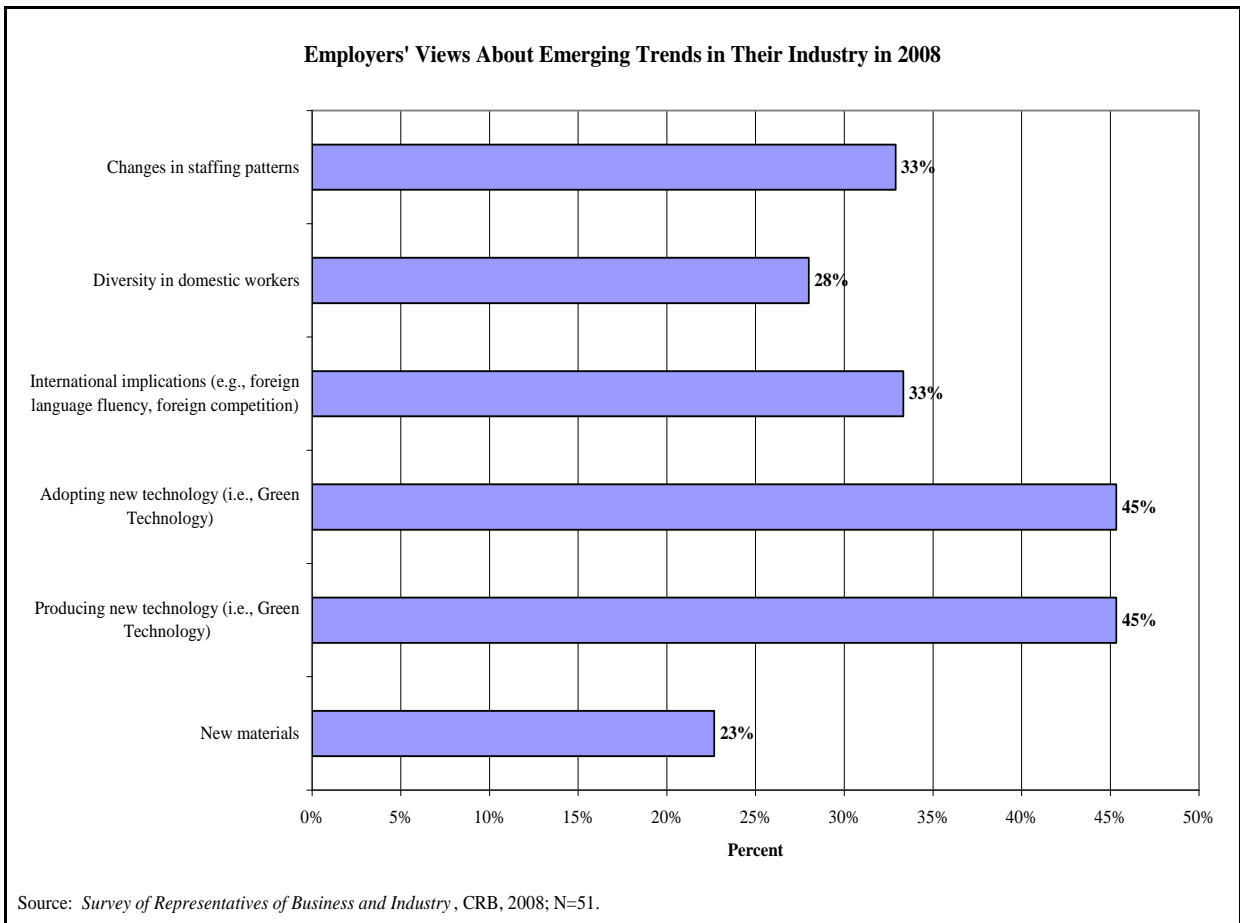
- “Intern in a firm, participate in a ‘Built Environmental Education Program’ (BEEP).” (Manufacturing Value Chain – *Design*)
- “School of Hard Knocks, sign up and start working in small firms.” (Manufacturing Value Chain – *Design*)
- “Entry-level workers may have opportunities in the insurance industry due to an initial lower salary and learning curve.” (Manufacturing Value Chain – *Design*)
- “Through volunteerism. Building skills in specific abilities like fundraising. Gaining a college degree. We are an industry where it is difficult to get very far up the ladder without a degree.” (Manufacturing Value Chain – *Design*)
- “Any student can start working at a dealership and advance either to a service position or sales. It is not uncommon for someone to stay in the industry to the point of ownership from an entry-level position.” (Retail Trade)
- “Several top-level executives in companies throughout the state began with their company as a box boy/bagger and worked their way through management.” (Retail Trade)

Emerging Trends

The final section of the employer survey asked respondents about: 1) emerging trends that might affect the occupations or job skills in their industries; 2) how responsive CEOs in their industries were to these trends; and 3) what, if any, changes had been made as a result of identifying these emerging trends. Survey questions also inquired about the presence of any pressures to leave California, and the impacts the pressures might have on their ability to employ students leaving high school, given their current skill levels.

About 70 percent of the respondents recognized the existence of emerging trends facing their industries. Of those who agreed, almost half of the respondents reported that producing or adopting new technology were important trends; and a third each indicated that changes in staffing patterns and international implications were trends they foresaw as affecting jobs or necessary job skills in their industries.

Several additional written comments addressed other issues: an older workforce that will be retiring within the next 5-10 years, the need for infrastructure investments, and the existence of excessive regulations and fees. When asked to rate the extent to which industry CEOs were responsive to emerging trends, more than 70 percent of respondents indicated that CEOs were “responsive” or “very responsive.” They explained how CEOs were conducting business differently as a result of emerging trends by: keeping up with new technologies, providing education and training opportunities for employees, screening job applicants better, undertaking succession planning for retirees, restructuring operations to create efficiencies, providing a greater diversity of services to keep competitive, and offering telecommuting to workers.



When asked to rate whether their firm or the firms in their industry faced any pressures to leave California, about 40 percent of the responding employers indicated that they face no pressure. Approximately 30 percent reported facing “some pressures,” and 13 percent stated that their firm or the firms in their industries face “enormous pressures.”

Among those respondents whose firms face some or enormous pressures to leave the state, the majority asserted that the pressures resulted from higher taxes; about 30 percent reported that pressures were due to the unpreparedness of the labor force, and about 20 percent thought the pressures were due to a lack of infrastructure. Other themes that emerged include: the high cost of living in the state (i.e., housing and transportation), unfriendly legislation, unreasonable regulations or fees, the lack of educated workers, the high cost of infrastructure building, the need for tax incentives (i.e., single sales factor), and outsourcing of workers.

The final set of questions in the employer survey asked whether “emerging trends” or the “pressures to change” affected their company’s ability or the ability of the companies in their industries to employ students leaving high school with their current level of skills. Responses were equally split between agreeing and disagreeing. When asked to elaborate on their responses, many respondents reiterated their opinions that a high school education was not sufficient for them to hire a graduate and that additional education and training were necessary.

A Recap of the Employer Survey Findings

There are some important themes to draw from the perspectives of representatives of business and industry who participated in the employer survey.

- About half of the responding employers believe that existing educational programs do not adequately prepare high school students for employment in the industries they represented. Several themes emerged from their comments that they offered to explain their responses, including: students do not have the necessary skills to perform the work; their recognition that the quality of education varies considerably among schools; the nature of jobs has changed, but the educational system has not; critical jobs require post-secondary education in some industries while other industries offer extensive opportunities for entry-level training; the lack of experiential learning such as career technical education because of the emphasis on theory; and students are not provided a connection as to why they need basic skills or provided exposure to what industries exist in the state.
- Three-quarters of the responding employers had established a partnership with public schools and the majority believed that their partnerships were beneficial to both the firms and students.
- Responding employers who did not cite a benefit resulting from a partnership reported a lack of staff resources, which limited their ability to work with students as well as a lack of school staff to support the effort. A lack of staff at firms was noted by nearly 80 percent of employers to explain why they had not established a partnership with schools.
- About 90 percent of responding employers also explained that the work is not suitable for high school students, necessitating their recruitment from four-year universities.
- The majority of responding employers agreed with the CRB's economic analysis of the fastest growing and largest occupations in California through 2014 and the top third job skills in the industries they represented, and provided input for other jobs and skills they considered important to their industries.
- About 70 percent of responding employers recognized the existence of emerging trends and described how CEOs were conducting business differently as a result.

Summary of Focus Groups

The school focus group phase of the study involved groups of middle and high school students, parents, or school representatives in rural, suburban, and urban communities around the state. The goal was to assess their understanding of California's economy and the students' futures as workers in that economy, and to identify any existing obstacles to providing all students with access to the tools, services, or programs they need to gain that understanding.

The school focus group report provides state policymakers and other interested stakeholders an insight into the many voices of students, teachers, counselors, principals, and parents that the CRB research team had the opportunity to listen to at a dozen school sites located in seven of the state's nine regional economies. Each focus group and school site provided a different perspective on the availability and value of career and economic information and experience for all students. We were especially interested in their understanding of their local economy, the preparation that students might need to succeed in it, and obstacles inhibiting student access to the activities, programs, or tools that would enable them to explore the "world of careers." Each focus group offered suggestions regarding the kinds of activities, programs, or tools that might enhance career exploration or development at their schools.

We found that the extent to which students, school staff, or parents understood the role of students in contributing to the state or their regional economy largely reflected on the missions and purposes, as defined by the schools. For example, we found at the middle school level, this connection was minimal, as reflected by the scarce career exploration opportunities offered to their students. The emphasis at three middle schools we visited was largely confined to providing students with basic skills in preparation for high school. This stemmed from the fact that many of the students in these middle schools were not performing at grade level, as measured by the state's standardized tests and their school's placement in Program Improvement under to the federal *No Child Left Behind Act of 2001*. This may be a missed opportunity, as the middle school students we met with were interested in learning more about the world of work and could benefit from information about educational requirements and the availability of a variety of jobs in the state and regional economies.

At the high school level, the focus group responses of students, school staff, and parents varied with regard to the role of students in contributing to the state or regional economies and were dependent largely upon the nature of their schools' priorities. For example, the communities of students, school staff, and parents at six comprehensive high schools visited by the CRB research team focused on preparing all students for high school graduation with an emphasis on pursuing general post-secondary education options, and therefore, those students expressed less specific awareness of career opportunities in their region or the state. However, the CRB research team discovered that among the comprehensive high schools, a couple had developed progressive grade-level career

exploratory programs and activities for *all* students that improved their understanding of career options after high school.

Three other high schools we visited that emphasized career technical education (CTE) had developed a shared culture and vision among students, school staff, and parents.

Three key elements included:

- Preparing students for high school graduation while introducing hands-on work experience opportunities.
- Providing students with opportunities to get involved with local business and industries.
- Assisting students with post-secondary education or training options to achieve their future career goals.

The students at these schools exhibited greater awareness of local and state economies and more interest in their future careers. As one principal succinctly put it, “Students leave our school with a plan of where they are going, not [just] a place.”

The CRB research team recognized the significance of career development curriculum as an important avenue to provide students with information about different jobs, including likely salaries, prerequisites, and opportunities in the regional or state economies. We found that although each of the nine high school teacher focus groups reported the availability of some career development curricula at their schools, there were significantly different levels of emphasis on formal, school-wide career exploration and development course offerings, and participation was not always available to all or even most students. For example, teachers at the magnet, charter, and alternative high schools which emphasized CTE reported that all students received intensive career exploration and development programs that involved hands-on, project-based learning activities. These learning activities were combined with opportunities to interact with local businesses and industries and provided instructional information about jobs and careers as a matter of priority, according to the stated objectives and missions at these schools. In addition, teachers collaborated with one another to integrate and share course objectives between academic departments.

In contrast, at four of the six high schools with comprehensive academic programs (each of which had at least a California Partnership Academy, Career Pathway, Regional Occupation Program elective, or small learning community), focus group teachers were aware that some faculty members offered some career exploration activities for students enrolled in elective courses, but the offerings were limited to those classes. However, at two comprehensive high schools, focus group teachers described a school-wide career exploration program wherein *all* students were required to present an independent career exploration research project, attend specific, grade-level career development activities, and complete job shadowing and internship hours required for graduation credit.

The CRB research team found that some high schools used career exploratory tools as a mechanism to provide students with general economic information (with varying degrees of reference to their regional or state economy).^{*} Often, student access to career exploration tools was limited because it was based on grade-level or class enrollment. At these schools some, but not all, students received guidance through school career centers. In some cases, individual teachers assigned research projects that focused on different occupations and their education requirements, salaries, job skills, working conditions, and local availability.

Several of the high school sites we visited have a school-wide approach to networking and connecting with local industry through business and education alliance memberships or community collaborative groups. This generally requires some outreach responsibilities to an administrator, career center staff, school-to-career coordinator, a ROP teacher, an outreach specialist, or a business alliance liaison. Partnerships with local business or other community groups foster an environment of mutual support and benefit students through expanded opportunities and material resources. There was consensus among all focus group participants (students, teachers, counselors, principals, and parents) that individual teachers deserve credit for their efforts to organize career activities for their students, or for all students at their schools. Some activities are also sponsored by school districts, local community colleges, or other private educational institutes.

In assessing the obstacles that prevented all students from accessing activities, programs, or tools that could help students to understand the importance of their current studies to their future careers, the CRB research team identified a number of contributing factors.

- Age and Maturity of Students: The age and maturity of many middle school and grade nine and ten high school students determined whether or not they had an awareness of possible career options and the education required to “get them where they wanted to go.” Conversely, most grade 11 and 12 students were fairly articulate regarding their plans for the future and demonstrated some awareness of future options relative to educational or career pursuits.
- Conflicting Enrollments: Some students who were enrolled in special academic programs such as Gifted and Talented Education (GATE), and parents whose children were enrolled in GATE felt that their enrollment precluded them from being able to access CTE or other courses deemed to be valuable to their overall preparation (such as a career-oriented course or the Advancement Via Individual Determination (AVID) program).[†]

^{*} Career exploration tools were defined as diagnostic, aptitude, or interest inventories to allow students to explore their interests or what they might like to do for a job or career.

[†] According to the California Department of Education, “the primary purpose of the Advancement Via Individual Determination (AVID) program is to provide a college preparatory program for students in the middle who are often economically disadvantaged and underachieving. The program enables disadvantaged secondary students to succeed in rigorous curricula, enter mainstream activities in school, and increase their opportunities to enroll in four-year colleges.” See: <http://www.cde.ca.gov/ci/gs/ps/avidsummary.asp>.

- **Minimal Career Guidance:** Most of the students participating in the middle school focus groups had not ever consulted with their school counselor and none had had any discussion with a counselor regarding career exploration or development. Only a few of the high school students at the nine focus group sites had consulted with their counselors regarding career exploration or development. A magnet high school with an emphasis on CTE was an exception – all of the grade 11 and 12 students had consulted with their school counselor regarding career development planning.

Recognizing that school counselors have high student caseloads, which vary in each school site and within each school, several parents commented that there were not enough counselors available to provide career guidance to their children, particularly given other priorities related to student academic progress.* However, parents commented that it was especially important to have school counselors assist students with career planning because “as teenagers, they think that their parents don’t know anything.”

Counselors described the need to focus on student progress toward meeting promotion and graduation requirements as a barrier precluding them from providing career guidance to all students. In addition to academic needs, middle school counselors also noted that students’ social, emotional, and health needs often required their attention, decreasing time for guidance in other areas. Several high school counselors agreed that inadequate staffing, combined with a priority on improving academic test scores and graduation rates, were significant obstacles to providing career guidance to all students. One parent commented that counselors spend more time with students who have “problems” than with those without them.

- **Parental Involvement:** At one middle school where we met with parents, we found that these parents had not been invited to career development activities or events held at the school for their children. In contrast, most high school parents had been invited to participate in a wide variety of school functions such as career days, college fairs, and other events. While notified of school-sponsored activities, many high school parents said they opted out of participating due to their busy work schedules, other family or conflicting commitments, or because of their belief that their children would benefit more if they were not directly involved. Some parents commented that students (especially in high school) need to begin choosing their own path of interest and to look for guidance independently of parents. For example, a mother was cautious about how she communicated suggestions to her son because he might lose interest if he thought she was pushing an agenda for his future. Counselors and principals encouraged parents to take an active role in helping their children meet

The AVID program was raised by focus group participants at various school sites. Singling out this program is not intended to place judgment upon other programs offered throughout the state that were not mentioned by focus group participants (i.e., the Mesa Program, Diploma Program, Middle College or Early College Program, etc.).

* The CRB research team found that counselors’ student caseloads vary among school sites and within each school, rendering any school or state comparison of counselors’ student caseloads to be meaningless.

expectations for attendance, grades, behavior, but they also emphasized the importance of students assuming responsibility for planning their own career goals.

- Inadequate Resources: Several principals pointed to serious challenges and barriers that inhibit career exploration or development activities, programs, or tools at their sites. These include inadequate resources, no existing structure or mechanism for inclusion in the curriculum, and an emphasis on basic skills instruction for struggling students. These same themes were echoed by some teachers who commented on the lack of student qualifications, academically or behaviorally (language, reading and math proficiency, communication skills, or even criminal records) or student responsibilities at home that prevent them from participating fully in career services offered at their schools. Some teachers also perceived a lack of interest from local business or industry to get involved in their schools, and they observed that the distressed socio-economic condition of the neighborhoods in which their schools were located did not provide opportunities for their students.

In connection with Education Code § 51228 (b), teachers and principals shared varying opinions about the expectations for providing career exploration and development services to all students. Some teachers and principals believed that in addition to a lack of funding, the law also needed clarification of its requirements. For instance, one teacher focus group at a comprehensive high school felt their school's career exploration program exceeded the state's expectations by requiring all students to complete career exploration research, job shadowing, and internship assignments, while other focus groups believed that due to a lack of provisions in their school site plans, there was no mechanism for providing formal career exploration or development curriculum for students other than providing basic skills instruction.

- Limited Career Exploration Opportunities: In schools where career activities or programs were available, students found them to be valuable and useful for learning about career possibilities and demonstrating to them the importance of post-secondary education or training. However, in focus group discussions at both middle and high school, students felt that career activities and programs would be improved if there were more variety of representatives from business and industry. They complained that career fair participants often consisted mainly of law enforcement officers, firefighters, paramedics, or members of the military. Students wanted greater interaction with business and industry, and would appreciate more follow-up after career fairs and job shadowing experiences.

Parents held differing views regarding the usefulness of their children's school career development services. Parents whose children were enrolled at comprehensive high schools concurred with students that the career activities and programs offered were valuable. However, some parents and students felt that students did not benefit from one-time experiences because there was no follow-up to reinforce the concepts presented to them. On the other hand, parents whose children were enrolled at schools with a CTE emphasis felt that their children's education was enriched by activities and programs that taught them to be accountable and responsible by learning professional work skills and habits.

Principals considered their schools' career exploration activities, programs, or tools to be useful, in varying degrees, for raising student awareness and providing information about jobs and the regional and state economies. For example, several principals agreed that career exploration activities, programs, or tools help students to develop a vision for their future and the relevance of academic progress. However, principals at several comprehensive high schools said that the career development services did not reach all students or that the information provided was insufficient. One principal commented that, "Some students get more involved in the programs and, therefore, enrich their learning experience more than others, because it's up to them to get out of it what they will." The majority of high school principals gave relatively high ratings to their programs for providing students with first hand experience, or motivating students to study at their grade level, or taking demanding courses and achieving at high levels.

- Student Demand for Programs: Some types of career exploration programs generate more interest, and are more popular than others. Principals at two high schools with a CTE focus reported that when student program enrollment declined, the school's administration discontinued offering those programs or developed another program to meet students' interest, even though the programs had been designed jointly with representatives of business and industry.
- Career Exploratory Tools: Student and parent focus groups had mixed reviews regarding the usefulness of career exploratory tools.* Most students at schools in which these tools were offered agreed that they were useful in providing a list of possible career options; however, in some cases, students and parents found their results to be too generic, easily manipulated and predictable, or whose outcome did not conform to a student's self-described personality or interest. Students and parents also expressed concern about the results being released to the military after taking the Armed Services Vocational Aptitude Battery (ASVAB) Career Exploration Program.†
- Business Partnerships: While teachers generally agreed that providing students with economic information and opportunities to interact with local businesses and industries improved their students' understanding of the relevance of their education, many noted that creating and maintaining these partnerships was very time consuming for faculty and administration. This sentiment was also evident in schools whose objectives and missions included career education for all students.

* Career exploratory tools were defined as diagnostic, aptitude, or interest inventories that assist students to explore their interests or what they might like to do for a job or career.

Appendix 2 lists the career exploratory tools (in addition to activities and programs) used at schools by responding principals and counselors of the principal and counselor surveys.

† While this was an expressed concern by students and parents, there are instructions for recruitment that include not granting permission to contact or recruit students who have taken the ASVAB Career Exploration Program.

At least one high school parent in each focus group reported that their child(ren) had some experience working with a local business or community organization or had participated in an internship, and they believed that the experience had been very beneficial. However, some parents at comprehensive high schools indicated that the rigors of their children's academic schedules and extracurricular activities, which were deemed necessary for college admissions applications, precluded them from gaining work experience. Counselors, at high schools with business or community involvement, agreed that their students had benefitted from the expanded opportunities and material resources that resulted from the partnerships with business.

The focus group report lists a number of suggestions that were made during the focus groups by participating students, teachers, counselors, principals, and parents. Some of the themes that emerged from all of the focus group participants include:

- Many students expressed the desire to receive more information from guidance counselors about the appropriate high school courses to take to improve future education and career opportunities.
- Many students, counselors, and principals would like access to more hands-on learning experiences that correlate with job opportunities in their local communities. For example, one high school principal recommended providing more resources for students to enable them to experience two weeks of workplace learning (i.e., funding, instructors, and outreach specialists).
- Students, teachers, and parents requested access to electives or expanded programs that correlate to job opportunities in their local communities or other programs such as AVID. Principals and parents also recommended that all students be required to take a career exploration course, either by expanding the grade ten programs or by providing some exposure for grade nine students. Some parents suggested the potential benefits of bringing career education and exploration opportunities to students in middle school.
- Students, counselors, and principals requested access to improved career aptitude or assessment tools and more accurate economic information such as the local job outlook, including educational requirements, job skill sets, working conditions, and salaries, as part of a comprehensive curriculum for career exploration. For example, principals and parents suggested restoring campus library services and implementing a means for students to access web-based career interest inventory software and other reference materials.
- Teachers and principals suggested incorporating concrete career exploratory assignments into their curriculum. That might include, for example, a career development course for students to begin exploring career options that would be incorporated into the schools' master schedules and budgets to provide funding for a dedicated teacher position and instructional materials.
- Teachers recommended allowing students to take courses at neighboring high schools or community colleges to augment their school's career development offerings.

Similarly, one principal suggested offering students a choice of high schools with different career exploratory or development programs to attend.

- Counselors suggested that schools raise public awareness and interest regarding career education in order to obtain commitment and financial support from the business community and to recruit support from school administrators as well as qualified personnel to serve as educators. A similar suggestion was offered by a principal as a way to raise parent and student awareness, by providing data that show how students benefit from career exploration and development education. Another principal suggested establishing a committee to discuss these issues at the beginning of the next school year. Finally, parents also discussed the need to secure funding to develop and support additional career pathways based on research about emerging local employment opportunities.
- Principals suggested organizing a career day for middle school students with presentations from a variety of local representatives. They also suggested enlisting assistance from their districts to: 1) have district school-to-work coordinators organize career exploratory activities, and 2) fund additional professional development for teachers to include training for presenting career development information to students.
- Principals and parents suggested conducting a senior exit survey to evaluate whether students had benefitted from completing required or voluntary career exploration activities and programs during their enrollment at their schools.
- Parents suggested improving their school's mentoring program for all students, by having the school compile a list of potential business or professional mentors for students to contact rather than leaving this responsibility to students.

A Recap of the School Focus Group Findings

The CRB research team has drawn a number of important conclusions based on our visits to 12 middle and high schools in California.

- Students expressed their interest in receiving more information regarding jobs and their availability, working conditions, education requirements, and salaries. At some schools where career days were offered, students recommended that a diverse workforce be represented as a way to gain exposure to the breadth of careers and industries available in the state.
- Some students (and parents) felt that their access to career development services was limited by their enrollment in a particular program such as GATE. This is not surprising, given that state law requires local school boards to prescribe two separate courses of study for students enrolled in high school: one designed to

prepare prospective students for admission to state colleges and universities; and a second designed for career technical training.*

- Students' demand for programs is an essential element for program planning. At two school sites the CRB research team visited, the local governing boards, school administrators, and local businesses and industries had jointly planned a course of study that later had to be discontinued due to declining student enrollment. These events indicated the importance in assessing student opinion despite those of well-intentioned adults.
- Teachers are at the heart of what students receive at school in all aspects of their education and preparation for life after high school; and many times the career exploration and development activities or programs that were provided to students resulted from teachers' efforts. If teachers do not have the support and encouragement from the state, their school districts, and their schools, it may not become a priority or a possibility for them to provide career development opportunities for students.
- While school counselors reported having high student caseloads, the CRB research team found that their caseloads vary by school and by individual counselor, thereby reducing the meaningfulness of state-reported ratios. Nevertheless, school counselors are one important source of career development information that, based on our limited observations, is rarely tapped into by students. This is because counselors are assigned to address other priorities or they may not have current information to share with students.
- The individual schools' defined missions and stated purposes are significant factors determining whether schools and their administration and faculty understand their role or place a priority on preparing students for their contributions to the state and regional economies after they leave high school. We found that the schools' missions and purposes were closely aligned to school staffs' interpretation of their local governing boards' views of the requirements of Education Code § 51228 (b).

* Education Code § 51224.

Appendix 1: California Map of Nine Economic Regions*

California Economic Strategy Panel Regions



* California Labor and Workforce Development Agency, Economic Strategy Panel, *California Economic Regions*. See: http://www.labor.ca.gov/panel/pdf/CESP_Regions_100606.pdf.

Appendix 2: Career Activities, Programs, and Tools

CAREER DEVELOPMENT ACTIVITIES, PROGRAMS, AND TOOLS

The school survey asked respondents to describe any career exploratory or development: 1) Activities (i.e., career days, guest speakers, or college fairs), 2) Programs (i.e., mentor programs, programs through a career enter, or computer-assisted programs), or 3) Tools (i.e., assessments including diagnostic aptitude or interest inventories) that their schools had offered to students, how often these services were offered, and to specify to whom. Table A.1 summarizes all of the schools' activities, programs, and tools reported by responding principals and counselors.

Table A.1(a)

<i>Activities</i>
Guest Speakers (i.e., community members, business leaders, representatives from community college and occupational schools, armed forces recruiters)
Career/College Fairs
Career Days/Nights
Parents' Night
Classes (i.e., particular subjects including food preparation, Geographic Information Systems, business environment, woodshop, computer repair & CAD, stock market, leadership development; independent living, or career exploration)
Career/College counseling
Workshops or seminars (how to write a resume, conduct interviews, [Free Application for Federal Student Aid] FAFSA, on science and health careers, etc.)
Competitions: Skills USA, Ford/AAA Troubleshooting; Poster contest
Special Events: Dr. Seuss' Birthday (members from the community read to students and tell them about their jobs); Demonstration Day, Alumni Day, Full Youth Empowerment Day
Work Ready Certificate (indicates the student's readiness for the school-to-work transition)
College Week
Job/College Visits
Brown bag luncheon programs
Senior Projects (Term paper including a future job search; "Senior Exit Interviews")
Individualized culmination planning with students and parents
Community service
Business Booster Club
Videos: "Exploring Your Options," "Gear Up to College"
Job Club
Military Recruitment

Table A.1(b)

<i>Programs</i>
Internships / Apprenticeships / Work Experience Education / Job Shadowing
Regional Occupational Programs or Centers (ROP/C) – provides career education, career development, and workforce preparation for students
Partnership Academies
Mentor programs
SUCCESS Consortium – support college preparatory efforts with low-income, first-generation college attendees and/or from schools in geographic areas with low college eligibility and attendance rates
Lab Volt Technology Education
Step-to-College – A CSU program that fosters collaboration between universities and high schools to increase high school matriculation to college
Advancement Via Individual Determination (AVID) program – designed to help underachieving middle and high school students prepare for and succeed in colleges and universities
MESA program (Math Engineering Science Achievement) – work with disadvantaged youth to excel in math and science and graduate with math-based degrees
Workability program – a transition program for special education students
Career Pathways
Federal Talent Search Program
Recruitment Programs
California Friday Night Live Program – provides leadership and support to young people to live healthy lifestyles and achieve in school
2 + 2 agreements with local community colleges
The Hippocrates Circle Program – provides career exploration in the field of medicine
Junior Achievement Program – educating students about workforce readiness, entrepreneurship, and financial literacy
Real Game of California – career-development curriculum
College: Make It Happen – program to inform families of early academic and financial planning in order for middle school students to have choices after high school graduation
Uniquely Me – a Girl Scouts Program that provides mentors and curriculum
UC Recruitment programs and Academic Talent Search
Peer-mentor program for freshmen (seniors are the mentors)
YWAR (Young Women at Risk) – provides information, resources, and skill-building opportunities that are most relevant to situations and issues young women face
Accelerated College Entrance (ACE) Mentor Program – open to 10-12th graders interested in architecture, construction and engineering
Career Pathways

Table A.1(c)

<i>Tools</i>		
<p>Aptitude and Interest Inventories:</p> <ul style="list-style-type: none"> • California Career Zone • Career Cruising • Real Games • COIN • Bridges.com • Choices • Naviance.com • Job O • Eureka.com • ASVAB (Armed Services Vocational Aptitude Battery) 	<ul style="list-style-type: none"> • COPS (Career Occupational Preference System) • COPEs (Career Orientation Placement and Evaluation Survey) • CAPS (Career Ability Placement Survey) • LifeWorks • CASAS (Comprehensive Adult Student Assessment Systems) 	<ul style="list-style-type: none"> • Career Locker • PLANS • myroad.collegeboard.com • Vocbiosonline.com • OpportunityKnocks.org • ACT/ Discover Program and other career-based software programs • “Get Insight” Career Exploration Program

BEST PRACTICES AND MODELS

This final section of the school survey report provides examples of schools that offer a variety of career development activities, programs, and tools at their schools and that have established numerous partnerships with their local community colleges, local businesses, and community organizations.

We selected these model schools for career development based on the responses of principals and counselors at intermediate schools and high schools, since these schools represented more than 60 percent of all survey responses. Their responses are described separately since more career development services are offered to students at high school than at intermediate schools. The model schools were chosen based on the number and extent of career development services that were provided to all students and the number of partnerships supporting these activities.

Model Intermediate/Middle Schools for Career Development

1. The first model intermediate school is located in a mid-sized city of the Bay Area region. Serving 658 students in the seventh and eighth grades, the school has over 80 percent non-White students.
 - Career development *activities*: a) Career Day (once a year for all students), b) elective classes that highlight careers (daily for most students), c) guest speakers (many times a year), AVID and other selected groups, and d) field trips to the Central County Occupational Program (currently working on).
 - Career development *programs*: a) Girls for A Change (meet twice a month for any girl who would like to join), and b) advisory program (20 minutes – four days/week for all students).
 - Individual teachers employ various career assessment and aptitude *tools*.
 - Community college representatives visit on Cesar Chavez Day and participate in other events when asked. AVID students also go on field trips to community colleges.
 - Business partnerships: a) IBM has provided workshops for girls, b) Xcel employees provide tutoring, and c) Intel and Cisco have donated money to the school.
2. Located in a large city of the southern California region, the second model intermediate school serves 781 students in grades six to eight. Over 90 percent of the student population is non-White.
 - Career development *activities*: a) Career Day (once per year for all students), b) speakers on related subjects (intermittently), c) a College Fair (once a year for all students), d) career development activities in which teachers direct career discussion for all grades, and d) AB 1802 conferences.

- Career development *programs*: a) AB 1802, b) Game Club – board games (such as LIFE once per week, for all students), c) ACEE After School Program (once per month for all students) and career books purchased for all students in the school library, and d) self-help information in counseling for all students.
- Involvement with local community colleges: a) School and community liaison meetings, b) UC Irvine college students serve as tutors and mentors.
- Involvement with local business: a) Received referrals from parents, teachers, and students, and b) guest speakers that relate to subjects every year (ongoing).
- Involvement with community organizations: a) Referrals from CSP Youth Service Programs, Inc. (youth shelter) and Turning Point (youth counseling for group/individuals, parenting), b) Community Resources including Boys & Girls Club, libraries, employment, hospitals, clinics, and housing, c) the Garden Institute, Inc., d) Child Guidance Center, e) Delhi Community Center, f) Corbin Center, and g) Discovery Science Center visits.

Model High Schools for Career Development

1. Located in a large city in the Bay Area region, the first model high school served 1,305 students from grades nine to 12 and has a majority non-White student population.
 - Career development *activities*: a) Career Day, (once every two years for all students), b) Guest speakers at various times (for 12th grade students), c) Week-long career exploration and research project (once a year for all ninth grade students), d) Community College Fair (once a year for all 11th and 12 grade students), and e) Community College field trips and presentations (once a year for all tenth, 11th and 12th grade students).
 - Career development *programs* include an annual week-long career exploration and research project for all ninth grade students.
 - Career development *tools* include COIN (once a year to ninth – 11th grade students) and CaliforniaColleges.edu (twice a year to all ninth grade students).
 - Community college representatives visit the school site and give presentations to 11th and 12th grade students on their programs.
 - Over 100 career professionals participated in Career Day, and also act as contact points for the ninth grade career exploration and research project.
 - The high school is involved with Central County Occupational Center.

2. This model high school serving 2,015 students in grades nine to 12 is located on the urban fringe of a large city in Los Angeles County. The student body is over 90 percent non-White.
- Career development *activities*: a) College/University Night (once a year for ninth –12th graders), b) Making College Count (annual assembly for 12th grade students), c) Boy Scouts of America, Learning for Life, speakers and explorers program (ongoing for ninth-12th graders), d) Survey tenth graders for careers and to determine speakers (once a year), e) College Information Day at Rio Hondo Community College (once a year for 11-12th graders), f) Pasadena City College Day at Rosemead High School (Campus ongoing, 11-12th graders), and g) Army National Guard – Career Directions Program (once a year, tenth-12th graders).
 - Career development *programs*: a) CSU Los Angeles – Federal Talent Search Program (ongoing for ninth-12th graders), b) Academy of Business Leadership – Summer Business Institute – (ongoing for ninth-12th graders), c) CSULA – Recruitment and Tutoring Program (ongoing for 11th and 12th graders); d) Rio Hondo College Recruitment Program (every other Friday for ninth-12th graders), e) Pasadena City College Recruitment Program (every other Thursday for ninth-12th graders), f) Rio Hondo College Extended Opportunity Service (ongoing for 12th graders), g) Pasadena City College XL Program, The Summer Bridge & First-Year Experience (ongoing for 12th graders), and h) Pasadena City College Fast Track – (ongoing for 12th graders).
 - Career development *tools*: a) Self-Directed Search – (once a year for ninth graders), b) "Choices" – (once a year for tenth graders), c) Career Direction, Army National Guard – (once a year for 11th graders), d) Pictorial Inventory, Special Education, ELs – (once a year for ninth-tenth graders).
 - Involvement with local community colleges: Rio Hondo Community College (i.e., students participate in the Rio Hondo College, Information Day (College Fair)), Rio Hondo Community College EOPS Program, Pasadena City College Day and Excel Program, East Los Angeles College Outreach Program, and Rio Hondo College Tech Prep Program.
 - Business partnerships: Kaiser Permanente has provided a summer internship program for the past ten years, and an academy of Business Leadership has provided students with internships in the business field for the past ten years. Students participated in Longo Toyota Career Day on their school site.
 - Involvement with other community organizations: a) Boy Scouts of America’s Learning for Life Program, in which students are surveyed to determine career interest and speakers are provided to classes, b) Kaiser Permanente’s Work Preparation Certificate Program, in which students participate in summer internships at Kaiser’s Baldwin Park, c) Longo Toyota’s Career Day, in which students participate in a one-day conference to learn about career opportunities in the auto industry, specifically at Longo Toyota, d) Academy of Business Leadership, in which students participate in a summer apprenticeship program

where they participate in learning about the world of business, develop a business plan, learn about the stock market and how to succeed in the business field, e) The Regional Occupational Program offered a variety of vocational training program/apprenticeships. The training and apprenticeship programs are conducted in local business and local technical colleges.

3. The third model high school for career development is located in a mid-sized city of the Southern California region. Serving 2,331 students in grades seven to 12, this high school has a majority White student population.
 - Career development *activities*: a) Career Speakers Day (four times a year for ninth graders), b) Mock interviews (once a year for half of the 11th graders), c) College Fair (once a year for all students), d) Career Fair (once a year for all students), e) Mentor Program (once a year for all academy students), and f) Internship program (once a year for a quarter of the 11th/12th graders).
 - Career development *programs*: a) Mentor Program (once a year for Academy students), b) Internship program (once a year for Academy students), c) Bridges/Explorer (all year for 80 percent of ninth graders), d) JA Company Program (all year for future business leaders), and e) Junior Achievement Teach for a Day (once a year for the Future Teachers Club).
 - Career development *tools*: Bridges.com (80 percent of ninth graders and all tenth grade Academy students).
 - The high school had a partnership with Moorpark College; they had a representative at their schools' career advisory board.
 - Local business partnerships for all students: Moorpark College offers Career Day, College Day (2001-present); Rotary Club offers job shadows (2001-present); over 75 businesses offer job shadowing experiences (2001-present); Thousand Oaks Auto Mall Career Day (2006); General Electric Engineering Day (2006); City of Thousand Oaks Career Day (2001-present).
 - Involvement with community organizations: a) CSUCI's student business conference (2004-present), b) Junior Achievement's Financial Literacy conference, c) Company program – Teach-for-a-Day (2004-present), and d) Careers4Teens' Internship program (2006-present).

Appendix 3: Selected Industry Clusters and Sectors

I. Basic Information Services

A. Telecommunications

- Wireless (Southern Border Region)
- Resellers (Greater Sacramento Region and Bay Area Region)

B. Publishing

- Newspaper, Book & Directory Publishers (Greater Sacramento Region and Southern Border Region)
- Software Publishers (Bay Area Region)

II. Manufacturing Value Chain

A. Logistics

1. General Freight Trucking (Northern Sacramento Valley Region, Southern California Region, and San Joaquin Valley Region)
2. Warehousing & Storage (Northern Sacramento Valley Region, Greater Sacramento Region, Southern California Region, Southern Border Region, and San Joaquin Valley Region)
3. Scheduled Air Transportation (Bay Area Region)
4. Couriers (Greater Sacramento Region, Bay Area Region, and Southern Border)

B. Production

1. Sawmills & Wood Preservation (Northern Sacramento Valley Region)
2. Fruit & Vegetable Preserving & Specialty Food Manufacturing (Northern Sacramento Valley Region and San Joaquin Valley Region)
3. Animal Slaughtering & Processing (San Joaquin Valley Region)
4. Computer & Peripheral Equipment Manufacturing (Bay Area Region and Greater Sacramento Region)
5. Semiconductor & Other Electronic Components (Bay Area Region, Greater Sacramento Region, and Southern Border Region)
6. Electronic Instrument Manufacturing (Southern California Region and Southern Border Region)
7. Cut & Sew Apparel Manufacturing (Southern California Region)
8. Motor Vehicle Manufacturing (Bay Area Region)

C. Design

1. Architectural, Engineering & Related Services (Northern Sacramento Valley Region, Bay Area Region, Greater Sacramento Region, Southern California Region, Southern Border Region, and San Joaquin Valley Region)
2. Management, Scientific & Technical Consulting Services (Northern Sacramento Valley Region, Bay Area Region, Greater Sacramento Region, Southern California Region, Southern Border Region, and San Joaquin Valley Region)

III. Health Science and Services

- A. General Medical & Surgical Hospitals (All Regions)
- B. Offices of Physicians (All Regions)
- C. Science Research & Development (Bay Area Region and Southern Border Region)

IV. Retail Trade

- A. Grocery Stores (Northern California Region, Northern Sacramento Valley Region, Central Coast Region, San Joaquin Valley Region, and Central Sierra Region)
- B. Building Material & Supplies Dealers (Northern California Region)
- C. Department Stores (Northern Sacramento Valley Region, Central Coast Region, San Joaquin Valley Region, and Central Sierra Region)
- D. Automobile Dealers (San Joaquin Valley Region)

Appendix 4: O*Net Job Skills*

In order to successfully attain and hold a job, an individual must demonstrate a variety of characteristics, knowledge, and skills. These requirements are summarized by occupation on O*Net. In this analysis, knowledge represents the acquisition of facts and principles, and experience lays the foundation for establishing procedures to work with that knowledge. These procedures are more commonly known as skills. Skills may be further divided into basic skills and cross-functional skills. Basic skills, such as reading, facilitate the acquisition of new knowledge while cross-functional skills, such as problem solving, extend across a number of activities.

Basic Skills are defined as “Developed capacities that facilitate learning or the more rapid acquisition of knowledge.” They are broken down into content and process skills.

Content Skills – Background structures needed to work with and acquire more specific skills in a variety of different domains.”

- **Reading Comprehension** – Understanding written sentences and paragraphs in work related documents.
- **Active Listening** – Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
- **Writing** – Communicating effectively in writing as appropriate for the needs of the audience.
- **Speaking** – Talking to others to convey information effectively.
- **Mathematics** – Using mathematics to solve problems.
- **Science** – Using scientific rules and methods to solve problems.

Process Skills – Procedures that contribute to the more rapid acquisition of knowledge and skill across a variety of domains.”

- **Critical Thinking** – Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
- **Active Learning** – Understanding the implications of new information for both current and future problem solving and decision making.
- **Learning Strategies** – Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.
- **Monitoring** – Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

* This information is taken from O*Net of the U.S. Department of Labor and can be viewed at: http://www.onetcenter.org/dl_files/ContentModel_DetailedDesc.pdf.

Cross-Functional Skills are defined as “Developed capacities that facilitate performance of activities that occur across jobs.” They are broken down into categories including social, complex problem solving, technical, systems, and resource management skills.

Social Skills – Developed capacities used to work with people to achieve goals.

- ***Social Perceptiveness*** – Being aware of others' reactions and understanding why they react as they do.
- ***Coordination*** – Adjusting actions in relation to others' actions.
- ***Persuasion*** – Persuading others to change their minds or behavior.
- ***Negotiation*** – Bringing others together and trying to reconcile differences.
- ***Instructing*** – Teaching others how to do something.
- ***Service Orientation*** – Actively looking for ways to help people.

Complex Problem Solving Skills – Developed capacities used to solve novel, ill-defined problems in complex, real-world settings.

- ***Complex Problem Solving*** – Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

Technical Skills – Developed capacities used to design, set-up, operate, and correct malfunctions involving application of machines or technological systems.

- ***Operations Analysis*** – Analyzing needs and product requirements to create a design.
- ***Technology Design*** – Generating or adapting equipment and technology to serve user needs.
- ***Equipment Selection*** – Determining the kind of tools and equipment needed to do a job.
- ***Installation*** – Installing equipment, machines, wiring, or programs to meet specifications.
- ***Programming*** – Writing computer programs for various purposes.
- ***Operation Monitoring*** – Watching gauges, dials, or other indicators to make sure a machine is working properly.
- ***Operation and Control*** – Controlling operations of equipment or systems.
- ***Equipment Maintenance*** – Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
- ***Troubleshooting*** – Determining causes of operating errors and deciding what to do about it.
- ***Repairing*** – Repairing machines or systems using the needed tools.
- ***Quality Control Analysis*** – Conducting tests and inspections of products, services, or processes to evaluate quality or performance.

Systems Skills – Developed capacities used to understand, monitor, and improve sociotechnical systems.

- ***Judgment and Decision Making*** – Considering the relative costs and benefits of potential actions to choose the most appropriate one.
- ***Systems Analysis*** – Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.
- ***Systems Evaluation*** – Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.

Resource Management Skills – Developed capacities used to allocate resources efficiently.

- ***Time Management*** – Managing one's own time and the time of others.
- ***Management of Financial Resources*** – Determining how money will be spent to get the work done, and accounting for these expenditures.
- ***Management of Material Resources*** – Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.
- ***Management of Personnel Resources*** – Motivating, developing, and directing people as they work, identifying the best people for the job.