

California Statewide Travel Demand Model, Version 2.0

Population, Employment, and School Enrollment

final report

prepared for

California Department of Transportation

prepared by

Cambridge Systematics, Inc.

and

HBA Specto, Inc.

final report

California Statewide Travel Demand Model, Version 2.0

*Population, Employment, and School
Enrollment*

prepared for

California Department of Transportation

prepared by

Cambridge Systematics, Inc.
555 12th Street, Suite 1600
Oakland, CA 94607

date

May 2014

Table of Contents

1.0 Introduction.....	1-1
1.1 Development of Base Year Socioeconomic Data	1-1
1.2 Development of Future Year Forecasts	1-1
2.0 Population	2-1
2.1 Year 2010 Population.....	2-1
Developing 2010 Target Files.....	2-2
Developing Samples	2-5
Performing the Synthesis	2-6
Results.....	2-6
2.2 Year 2000 Population.....	2-12
2.3 Future Year Forecasts - Population.....	2-12
Review of Population Forecasts by MPOs and RTPAs.....	2-12
AMBAG.....	2-2
Butte County.....	2-2
Del Norte County	2-2
Humboldt County	2-2
MTC.....	2-2
SANDAG.....	2-2
SBCAG.....	2-2
SLOCOG.....	2-2
Tahoe RPA	2-2
Development of Future Year Target Files	2-3
Running the Population Synthesizer.....	2-3
2.4 Total Population Forecasts by Year	2-3
3.0 Employment	3-1
3.1 Year 2010 Employment.....	3-2
Data Sources.....	3-3
California Employment Development Department (EDD).....	3-3
ACS Journey to Work.....	3-3
ACS Equal Employment Opportunity (EEO).....	3-3
Longitudinal Employment and Household Dynamics (LEHD) OnTheMap	3-4

Military Employment.....	3-4
Data Processing Method.....	3-6
Employment by Industry.....	3-6
Employment by Occupation.....	3-6
3.2 Year 2000 Employment.....	3-8
3.3 Future Year Forecasts – Employment.....	3-8
Review of Population Forecasts by MPOs and RTPAs.....	3-11
AMBAG.....	3-11
Butte County.....	3-11
Del Norte County.....	3-11
Humboldt County.....	3-12
MTC.....	3-12
SACOG.....	3-12
SANDAG.....	3-13
SBCAG.....	3-13
SCAG.....	3-13
SLOCOG.....	3-13
Tahoe RPA.....	3-14
3.4 Total Employment Forecasts by Year.....	3-14
4.0 School Enrollment.....	4-1
4.1 Year 2010 School Enrollment.....	4-1
4.2 Year 2000 School Enrollment.....	4-3
4.3 Future Year Forecasts – School Enrollment.....	4-3
MTC.....	4-3
SCAG.....	4-3
Other Regions.....	4-4
4.4 Total School Enrollment Forecasts by Year.....	4-4
5.0 Socioeconomic Data Results.....	5-1
A. Future Year Forecasts Documentation.....	A-1
A.1 Resources.....	A-1
A.2 Reference List of Forecast Data Files and Reports (MPO/RTPA).....	A-2
A.3 Summary of Zonal Data from MPOs and RTPAs.....	A-2
B. County-level Total Population Forecasts.....	B-1
C. County-level Total Employment Forecasts.....	C-1

D. County-level School Enrollment Forecasts.....D-1

List of Tables

Table 1.1	Review and Update of Future Year Forecasts by Region.....	1-2
Table 2.1	Year 2010 Synthetic Population Target Data and Data Sources.....	2-4
Table 2.2	Year 2010 Total Population and Households – Synthetic versus Observed	2-10
Table 2.3	Year 2010 Household Characteristics – Synthetic and Observed ...	2-11
Table 3.1	CSTDM Employment Industry Categories	3-1
Table 3.2	CSTDM Employment Occupation Categories.....	3-2
Table 3.3	Shares of Self-employment by Industry	3-8
Table 3.4	Year 2010 Total Employment by Data Source, Select Counties	3-10

List of Figures

Figure 2.1	Example Aggregations of Census Tracts (Census “Zones” for Population/Household ACS Data).....	2-3
Figure 2.2	PUMS Samples.....	2-5
Figure 2.3	Zones and PUMAs in San Joaquin Valley	2-6
Figure 2.4	Year 2010 Total Population per Square Mile (Statewide, MTC, and SCAG regions).....	2-8
Figure 2.5	Population Synthesizer Regions.....	2-9
Figure 2.6	Total Statewide Population, by Year.....	2-4
Figure 3.1	Year 2010 Total Military Employment.....	3-5
Figure 3.2	Year 2010 Total Employment per Square Mile (Statewide, MTC, and SCAG regions).....	3-7
Figure 3.3	Total Statewide Employment, by Year	3-15
Figure 4.1	Year 2010 County-level School Enrollment (K-12).....	4-2
Figure 4.2	Total Statewide School Enrollment, by Year	4-5
Figure 5.1	Total Population, Employment, and School Enrollment, by Year.....	5-1

1.0 Introduction

This document provides background information and a description of the socioeconomic data for the CSTDM Version 2 (CSTDMv2). The CSTDM has Year 2010 as the base year for model estimation, calibration, and validation. A Year 2000 scenario was also created for a backcast sensitivity run. Multiple future year forecasts were also developed for 2015, 2020, 2035, 2040, and 2050.

The CSTDM socioeconomic data (SED) inputs included the synthesized population and a zonal properties file, which included employment, school enrollment, and several other zonal properties (as described in the *Zonal Properties* documentation).

The person and household totals by TAZ are required as inputs to the CSTDM for any scenario. As with CSTDM09, a population synthesizer was used to derive a synthetic but realistic population using known target totals for several key characteristics, such as income class, dwelling type, and age.

1.1 DEVELOPMENT OF BASE YEAR SOCIOECONOMIC DATA

The synthesized population was based on 2010 U.S. Census and ACS population and household statistics. Employment by industry and occupation was based on several data sources including the following: American Community Survey (ACS) Journey-to-Work data for county-level total employment control totals, ACS Equal Employment Opportunity (EEO) data for county-level employment shares by industry and occupation categories, Census Longitudinal and Household Dynamics (LEHD) OnTheMap data products for spatial distribution of employment by industry, and the 2000 CSTDM synthetic occupation by industry employment rates.

School enrollment and location data for Kindergarten through 12th grade were obtained from the California Department of Education. Post-secondary education data was obtained from the Integrated Postsecondary Education Data System (IPEDS) Data Center within the National Center for Education Statistics.

1.2 DEVELOPMENT OF FUTURE YEAR FORECASTS

Updated future year forecasts were developed to reflect adopted MPO and RTPA forecasts as of early summer 2013. The starting point of these forecasts were developed by the Institute of Transportation Studies at the University of California at Davis (ULTRANS) in 2011 for years 2020, 2035, and 2050. Additional scenarios for years 2015 and 2040 were subsequently developed by

Cambridge Systematics, Inc. in 2012. These forecasts were subsequently updated in 2013 for regions with newly adopted SED forecasts as part of their Regional Transportation Plans (RTPs) or Sustainable Community Strategies (SCSs).

SED forecasts for the MTC, SACOG, SANDAG, and SCAG regions were generally developed and adopted by the MPOs between early 2010 and late 2012. These MPOs and more were contacted for their most up-to-date SED forecasts and compared to the CSTDM, with the CSTDM forecasts updated where needed. Table 1-1 summarizes the regions contacted, and whether population and/or employment required updating after comparing to the baseline forecasts developed by ULTRANS.

Table 1.1 Review and Update of Future Year Forecasts by Region

Region	Update to Population Required?	Update to Employment Required?
MTC	Yes	Yes
SCAG	Yes*	Yes
SACOG	Yes	Yes
SANDAG	No	No
AMBAG	No	No
SLOCOG	Yes	Yes
Tahoe RPA	Yes	Yes
SBCAG	Yes	Yes
Butte County	No	Yes
Del Norte County	No	No
Humboldt County	No	No

*For SCAG, only the distribution of number of workers per household required an update.

Additionally, California Department of Finance (DOF) and Moody's Analytics (Economy.com) data was reviewed for rural counties in California. Employment forecasts for Amador, Calaveras, Inyo, Lake, Mariposa, Mendocino, Plumas, Sierra, and Tuolumne Counties were updated to show reasonable growth in the future years.

2.0 Population

The population synthesizer developed by HBA Specto works by combining a trial population of households and altering it by switching new possible households in. If the match with the targets improves, the new household is kept. A detailed description of the algorithms used in this process is part of the CSTDM09 documentation¹. The population synthesizer is capable of handling multiple nested geographies, of matching categorical totals or averages, and of weighting possible targets. The weighting capability is useful if some targets are considered to be more important than others, or if the scales differ (such as with an average income category).

In general, synthesizing the population consists of four steps:

- 1) Creating sample tables or individual household records;
- 2) Creating target tables or control totals for available geographies;
- 3) Testing the goodness of fit; and
- 4) 4) Aggregating the synthesized population by traffic analysis zones (TAZ).

To enhance the accuracy of the population synthesis, population is synthesized by Census Public Use Microdata Areas (PUMA). Each PUMA has a sample table and a target table.

2.1 YEAR 2010 POPULATION

For the year 2010, some data was used directly from the U.S. Census without much modification, because these data are available in small geographies. For example, Year 2010 population totals can be found by Census block. The block totals can then be aggregated to the TAZ-level, and the population synthesizer can be run to cross-tabulate the population totals with all the other household characteristics associated with each household and person.

The ACS PUMS person and household data for the years 2009-2011² are available from the website of the Census Bureau ([http:// http://factfinder2.census.gov](http://factfinder2.census.gov)). PUMS data includes all persons in a household with both person and household attributes. However, PUMS data for California are only spatially located within

¹ Source: Caltrans,
http://www.dot.ca.gov/hq/tsip/otfa/cstdm/documents/tdm/CSTDM09_Population_Final.pdf. Accessed May 5, 2014.

² 2006-2010 5-year dataset was used

233 Public Use Microdata Areas (PUMAs). As a result, they cannot be used as the inputs for the CSTDM directly.

Developing 2010 Target Files

For the 2010 population synthesis, some population targets were available at the block level, and thus, could easily be aggregated to the TAZ level. Targets were treated categorically (for example, rather using an average household size, the number of households in seven size categories were represented). Where categorical totals were used, all weights were set at 1.0. These targets were all derived from 2010 Census Summary File 1 (SF1) totals, provided at the block level and aggregated to the zonal level.

For the remainder of the desired population and household data, ACS data was used to generate the target tables. While the data was available at the Census Tract level, the tracts were aggregated into larger Census "Zones" to reduce the margins of error. As an example, Figure 2.1 shows the geographic distribution of those Census "Zones" in the San Francisco Bay Area compared to the CSTDM TAZs. Census "Zones" respected TAZ boundaries so that targets within the Census Zones were meaningful at the TAZ level.

These targets were used to match proportions, such as 2.12% zero car households in a given Census Zone, with larger weights used to compensate for the proportional nature of the targets. The number of categories and the description of all targets are presented in Table 2.1.

The population synthesizer used a large number of targets. These included forecast data at the (1) CSTDM TAZ level for all available population attributes (i.e. total population and household size) and (2) Census "Zone" level household category distributions (i.e. workers, income, and autos). Weight multiplier files and samples files were also required by the Population Synthesizer. A weight multiplier file was used to identify the PUMAs (geographic unit of analysis for PUMS records) in and around TAZ from which to draw PUMS household records. Samples files contained the regional PUMS households. Due to regional differences in target categories, unique population syntheses using region-specific population attributes were conducted. The results of the population syntheses for all the regions were combined into one statewide synthetic population for each horizon year.

Samples files described each household in the PUMS in terms of the control total categories in the target files; for instance, a target file may have a target for the number or proportion of low income households in an area, and the samples files indicate whether a given PUMS record is a low income household or not, for comparison against the targets. Thus, the same samples files can be used for all model runs.

Figure 2.1 Example Aggregations of Census Tracts (Census “Zones” for Population/Household ACS Data)

-  Census "Zones" for CSTDM
-  CSTDM TAZs

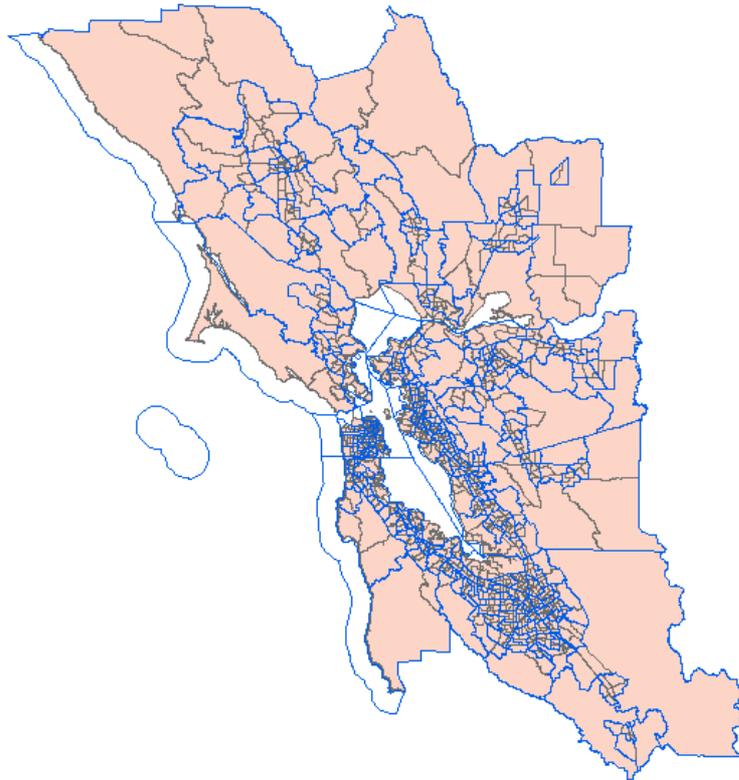


Table 2.1 Year 2010 Synthetic Population Target Data and Data Sources

Type	Data Source	Source Table	Geographic Level in Raw Data	Aggregate Geographic Level in Target Files	Number of Categories	Detail
Total Population	2010 Census	P12	Census Blocks	CSTDM TAZ	n/a	Numerical
Age Distribution	2010 Census	P12	Census Blocks	CSTDM TAZ	10	Ages 0-4, 5-15, 16-18, 19-21, 22-24, 25-39, 40-54, 55-64, 65+
Household Size	2010 Census	H13	Census Blocks	CSTDM TAZ	7	1 person, 2 persons, 3 persons, 4 persons, 5 persons, 6 persons, 7+ persons
Group Quarters	2010 Census	P42	Census Blocks	CSTDM TAZ	2	Institutionalized and Non-institutionalized
Dwelling Type	2010 ACS 5-Year Data	B25032	Census Tracts	Census "Zones"	5	Single-family detached, single-family attached, multi-family, mobile home, group quarters
Students by School Type	2010 ACS 5-Year Data	B14001	Census Tracts	Census "Zones"	3	Kindergarten to Grade 8, Grade 9-12, College/University
Workers by Occupation	2010 ACS 5-Year Data	C24060	Census Tracts	Census "Zones"	8	Managerial/Business, Professional/Technical, Education, Healthcare, Service, Sales/Food/Entertainment, Clerical, Blue Collar
		B23001	Census Tracts	Census "Zones"	9	Military
Households by Number of Workers	2010 ACS 5-Year Data	B08202	Census Tracts	Census "Zones"	4	0 workers, 1 worker, 2 workers, 3+ workers
Auto Ownership	2010 ACS 5-Year Data	B08201	Census Tracts	Census "Zones"	6	0 cars, 1 car, 2 cars, 3 cars, 4 cars, 5+ cars
Household Income	2010 ACS 5-Year Data	B19001	Census Tracts	Census "Zones"	7	0-10k, 10-25k, 25-50k, 50-75k, 75k-100k, 100-150k, 150k+

Developing Samples

For the Year 2010 population synthesis, PUMS data were used as the basis for individual samples. Figure 2.2 shows a snapshot of a sample table. These samples consist of housing units and persons. A composite sample record was created for each PUMS housing unit and the associated person record(s), including the totals for each of the targets. For instance, a housing unit of 2 people living in a 5 to 9 unit apartment building; a 38 year old factory worker and a 42 year old welder with a combined annual income of \$82,302 would become a record of 1 household of 2 persons, in the \$75,000 to \$100,000 income category, living in a multifamily dwelling with 2 cars, 1 person aged 25-39, and 1 person aged 40-54, and 2 blue collar workers. (There would be 0 listed for other value in the table; in this case, there are 0 students, 0 households living in a single family dwelling unit, 0 1-person households, and so on.)

Figure 2.2 PUMS Samples

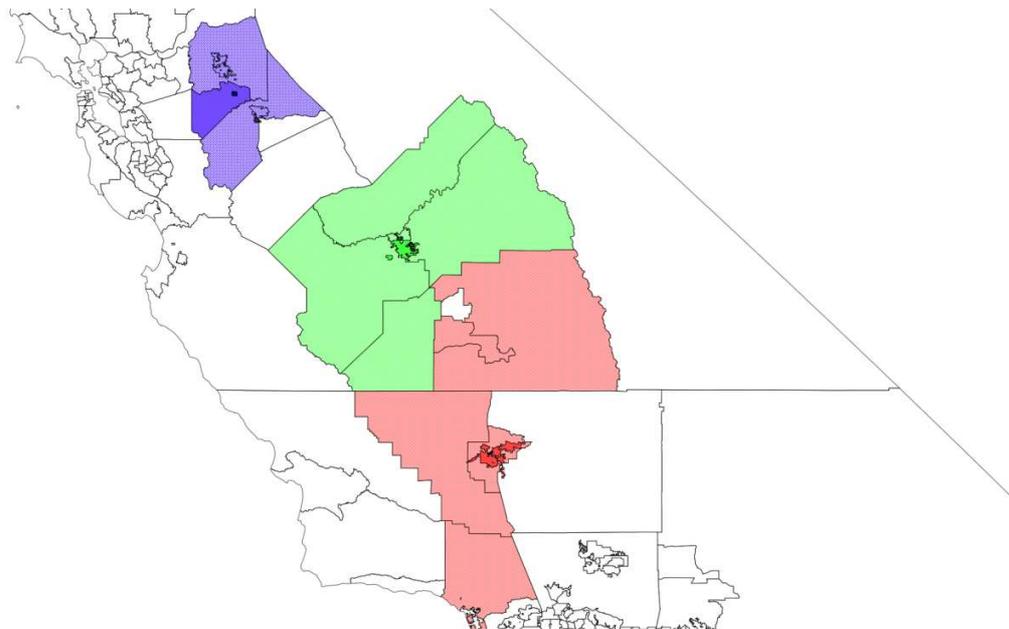
	A	B	C	D	I	J	K	L	M	N	O	P
1	UniqueID	1_pers	2_pers	3_pers	type_sfd	type_att	type_mult	type_mh	inc_0_10	inc_10_25	inc_25_50	inc_50_75
2	3513665	1	0	0	0	0	1	0	0	1	0	0
3	3513665	1	0	0	0	0	1	0	0	1	0	0
4	3513665	1	0	0	0	0	1	0	0	1	0	0
5	3513665	1	0	0	0	0	1	0	0	1	0	0
6	3513665	1	0	0	0	0	1	0	0	1	0	0
7	3513665	1	0	0	0	0	1	0	0	1	0	0
8	3513665	1	0	0	0	0	1	0	0	1	0	0
9	3513665	1	0	0	0	0	1	0	0	1	0	0
10	3513665	1	0	0	0	0	1	0	0	1	0	0
11	3513665	1	0	0	0	0	1	0	0	1	0	0
12	3513665	1	0	0	0	0	1	0	0	1	0	0
13	3513665	1	0	0	0	0	1	0	0	1	0	0
14	3513665	1	0	0	0	0	1	0	0	1	0	0
15	3513665	1	0	0	0	0	1	0	0	1	0	0
16	3513665	1	0	0	0	0	1	0	0	1	0	0
17	3513665	1	0	0	0	0	1	0	0	1	0	0
18	3513665	1	0	0	0	0	1	0	0	1	0	0
19	3513665	1	0	0	0	0	1	0	0	1	0	0

Because California is a such a large state, the population characteristics vary significantly from place to place; people from suburban Orange County may have very different characteristics than people from rural Humboldt County or downtown San Francisco. Weight multiplier files specify which samples are available to be used for a given target. The idea was to use a population of similar makeup in a given geographic area so that the correlations between various targets are implicitly retained in the synthesis.

Weight multiplier files were prepared for the 2010 synthesis, specifying which PUMAs that each zone was to use for the pool of samples. The own-zone PUMA samples were given a weight of 1.0, and the next five closest PUMAs geographically were given a weight of 0.2, effectively producing a sample pool half of the residents of the area, and half of nearby neighbors. Figure 2.3 below

illustrates this for three zones in the San Joaquin Valley; zones have a thick outline, the own-PUMAs have a dark fill and the five next PUMAs have a pale fill.

Figure 2.3 Zones and PUMAs in San Joaquin Valley



Performing the Synthesis

The synthesis was executed in two runs, one containing the SCAG MPO area and one containing the remainder of the state. It should be noted that the samples used are locally relevant (same PUMA and closest 5 others) and the targets were all defined at the county level or finer level of detail, so multiple counties could be synthesized in one run simultaneously and independently. The reason for dividing the state and performing two runs was memory limitations on the processing machines.

The results of each synthesis run were reviewed manually to verify that the synthetic population matched the individual targets to the best degree possible, and using a goodness of fit measure. The synthesizer fits were considered acceptable.

Results

The resultant synthetic population was summarized by population and household characteristics for each TAZ. Population data were plotted for reasonableness, as shown in Figure 2.4. The marginals (i.e., row and column sums) were also summed at the county level county and were compared to observed data from the Census and ACS to ensure that the synthesizer performed well against the targets. The total synthetic population and

households closely matched the observed 2010 Census data. See Table 2.3 and Figure 2.5 for corresponding regions.

Table 2.4 also provides a comparison between the synthetic population and observed data for some example characteristics. The synthesizer performed well, even for small subsets of the population, like zero-vehicle households. Appendix B summarizes total population for each county.

Figure 2.4 Year 2010 Total Population per Square Mile (Statewide, MTC, and SCAG regions)

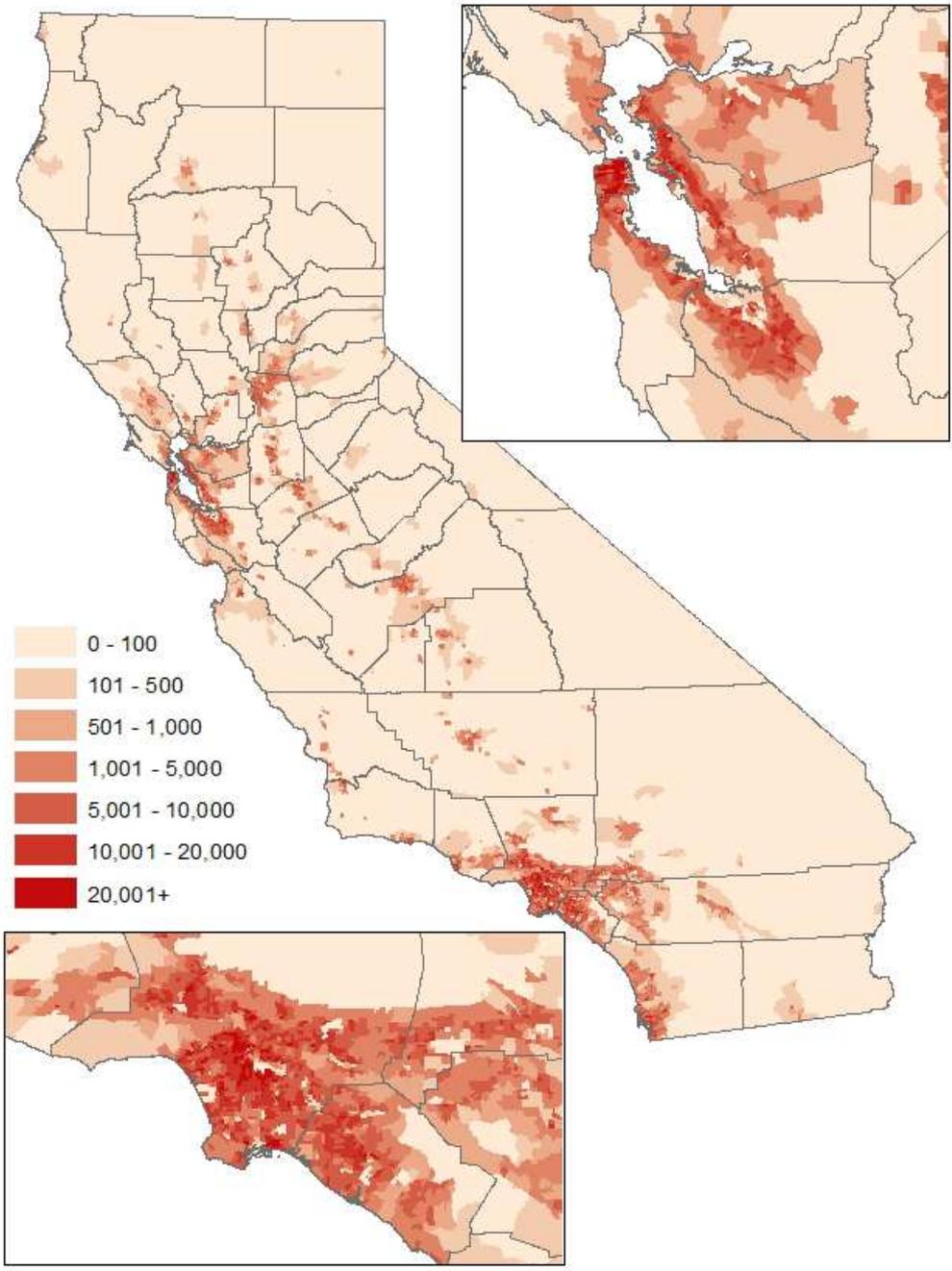


Figure 2.5 Population Synthesizer Regions

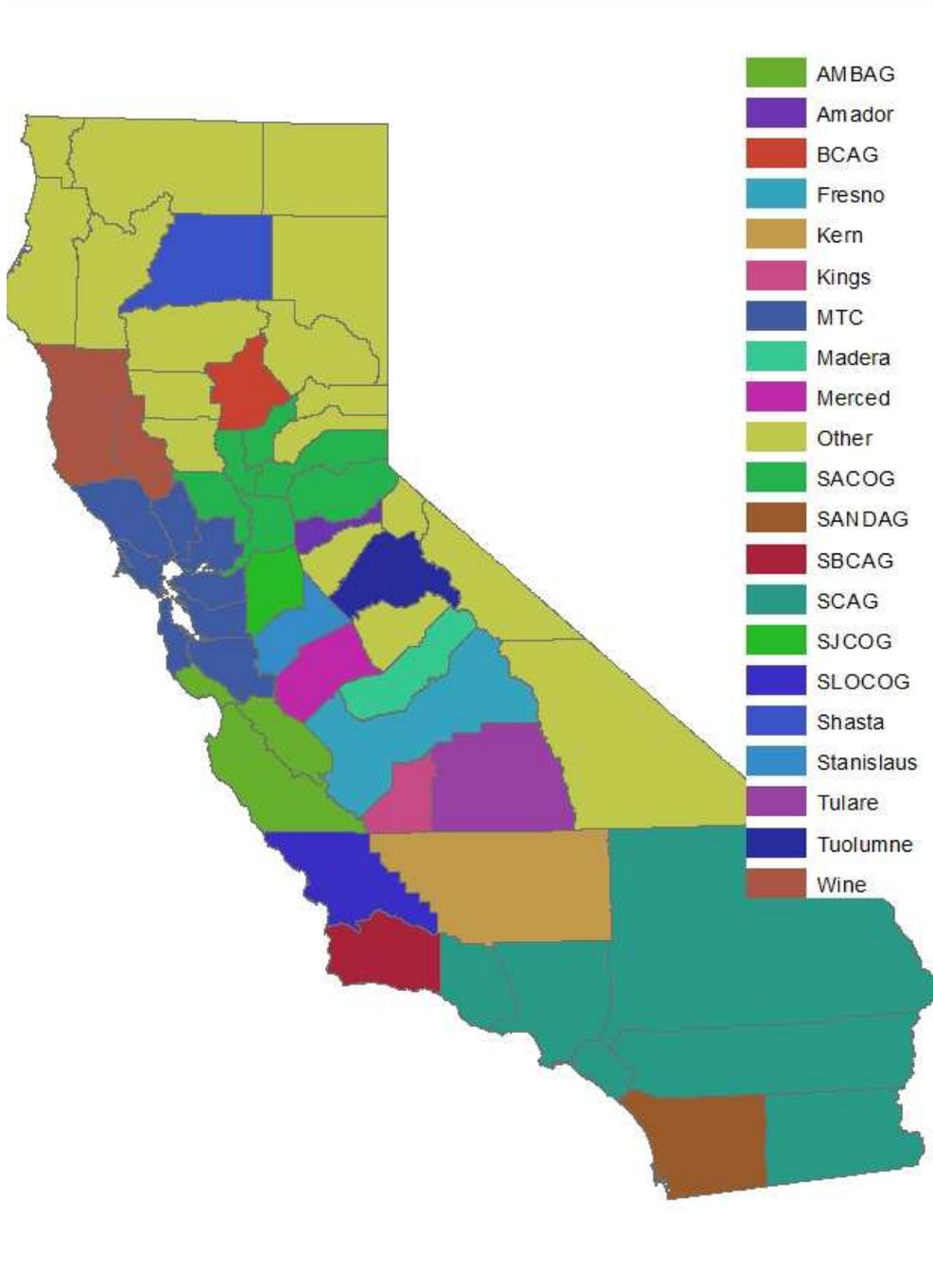


Table 2.2 Year 2010 Total Population and Households – Synthetic versus Observed

MPOs/ Regions	Total Population			Total Number of Households		
	Census	CSTDM	Percent Difference	Census	CSTDM	Percent Difference
Amador	38,091	38,094	0.00%	14,569	14,572	0.00%
AMBAG	732,708	732,686	0.00%	237,106	237,459	0.10%
BCAG	220,000	220,005	0.00%	87,618	87,634	0.00%
Fresno	930,450	930,419	0.00%	289,391	289,753	0.10%
Kern	839,631	839,632	0.00%	254,610	254,896	0.10%
Kings	152,982	153,006	0.00%	41,233	41,302	0.20%
Madera	150,865	150,877	0.00%	43,317	43,432	0.30%
Merced	255,793	255,768	0.00%	75,642	75,801	0.20%
MTC	7,150,739	7,150,667	0.00%	2,608,023	2,609,822	0.10%
Other	599,267	599,270	0.00%	239,150	239,240	0.00%
SACOG	2,316,019	2,316,006	0.00%	843,411	843,798	0.00%
SANDAG	3,095,313	3,095,201	0.00%	1,086,865	1,087,895	0.10%
SBCAG	423,884	423,873	0.00%	142,104	142,234	0.10%
SCAG	18,047,438	18,047,015	0.00%	5,847,909	5,852,125	0.10%
Shasta	177,223	177,226	0.00%	70,346	70,370	0.00%
SSJCOG	685,306	685,287	0.00%	215,007	215,205	0.10%
SLOCOG	269,637	269,642	0.00%	102,016	102,054	0.00%
Stanislaus	514,453	514,445	0.00%	165,180	165,314	0.10%
Tulare	442,179	442,168	0.00%	130,352	130,527	0.10%
Tuolumne	55,365	55,366	0.00%	22,156	22,164	0.00%
Wine	152,506	152,503	0.00%	61,493	61,538	0.10%
Total	37,249,849	37,249,156	0.00%	12,577,498	12,587,135	0.10%

Table 2.3 Year 2010 Household Characteristics – Synthetic and Observed

MPOs/ Regions	Total One-person Households			Total Number of Zero-vehicle Households		
	Census	CSTDM	Percent Difference	ACS	CSTDM	Percent Difference
Amador	3,903	3,908	0.10%	593	589	-0.70%
AMBAG	54,832	54,782	-0.10%	13,966	14,013	0.30%
BCAG	24,420	24,429	0.00%	6,027	6,169	2.40%
Fresno	57,312	57,275	-0.10%	25,681	26,015	1.30%
Kern	49,209	49,243	0.10%	18,445	18,669	1.20%
Kings	7,197	7,266	1.00%	2,627	2,563	-2.40%
Madera	7,251	7,270	0.30%	2,340	2,390	2.10%
Merced	13,157	13,119	-0.30%	5,814	6,006	3.30%
MTC	680,925	680,750	0.00%	244,695	251,865	2.90%
Other	67,165	67,181	0.00%	13,170	13,219	0.40%
SACOG	207,439	207,420	0.00%	52,050	52,312	0.50%
SANDAG	261,217	260,978	-0.10%	65,128	66,732	2.50%
SBCAG	35,258	35,218	-0.10%	9,367	9,364	0.00%
SCAG	1,294,771	1,293,071	-0.10%	428,225	430,913	0.60%
Shasta	18,185	18,187	0.00%	4,833	4,906	1.50%
SJCOG	42,389	42,357	-0.10%	13,443	13,525	0.60%
SLOCOG	26,773	26,795	0.10%	4,523	4,487	-0.80%
Stanislaus	31,923	31,898	-0.10%	11,055	11,091	0.30%
Tulare	21,588	21,580	0.00%	9,109	9,379	3.00%
Tuolumne	6,263	6,265	0.00%	1,110	1,105	-0.50%
Wine	18,265	18,262	0.00%	3,768	3,887	3.20%
Total	2,929,442	2,927,254	-0.10%	935,969	949,199	1.40%

2.2 YEAR 2000 POPULATION

The synthetic population for Year 2000 was kept largely the same as was used in the previous model version, which was based on Year 2000 Census Summary File 3 (SF3) data. Changes to the Year 2010 synthetic population included:

- Reallocating some population and households to reflect the updated TAZ system.
- Updating views for compatibility with the new Short Distance Personal Travel Model (SDPTM).

2.3 FUTURE YEAR FORECASTS – POPULATION

The initial CSTDM forecasts available were developed by the Institute of Transportation Studies at the University of California at Davis (ULTRANS) for years 2020, 2035, and 2050. Additional scenarios for years 2015 and 2040 were developed by Cambridge Systematics, Inc. by interpolating years 2010 and 2020 for year 2015 and by interpolating 2035 and 2050 (or extrapolating, where appropriate) for year 2040 population and employment forecasts. These forecasts were the starting point for developing updated future year forecasts. For the purposes of this documentation, the ULTRANS population forecasts were considered part of the CSTDM09 model system.

Review of Population Forecasts by MPOs and RTPAs

The 2020 and 2035 forecasts developed by ULTRANS reflected the adopted forecasts in RTPs across the state as of 2011. 2050 data from ULTRANS were generally extrapolated from earlier horizon years as most MPOs did not have official 2050 SED forecasts.

More recently adopted RTPs were reviewed with Caltrans staff. Several MPOs had subsequently adopted new SED forecasts. These MPOs included: MTC, Tahoe RPA, and SBCAG. In addition, several other MPOs were contacted for their latest SED forecasts (as listed in Table 1.1). After reviewing MPO data and comparing to the CSTDM09 projections, the following regions required updates to the population forecasts:

- MTC
- SCAG
- SACOG
- SBCAG
- SLOCOG
- Tahoe RPA

AMBAG

The project team received future year forecasts for AMBAG consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

Butte County

The project team received future year forecasts for BCAG consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

Del Norte County

The project team received future year forecasts for Del Norte County consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

Humboldt County

The project team received future year forecasts for Humboldt County consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

MTC

Updated population projections received from MTC were incorporated into the CSTDMv2.

SANDAG

The project team received future year forecasts for SANDAG consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

SBCAG

Updated population projections received from SBCAG were incorporated into the CSTDMv2.

SLOCOG

Updated population projections received from SLOCOG were incorporated into the CSTDMv2.

Tahoe RPA

Updated population projections received from TRPA were incorporated into the CSTDMv2.

Development of Future Year Target Files

Because of the various sources of data that the targets are comprised of, there was potential for internally inconsistent data. For example, total population and number of households were zonal targets and proportions of household size were given at the LUZ level. Applying those household size distributions to the total number of households would yield one estimate of total population, which may be different from the population target. Instances such as these may have required some manual adjustments (as noted above) and also made QA/QC an essential process. Some of the quality control checks that were performed included:

- Calculating the average household size for all households and the average household size of households with 4 or more members for each TAZ as well as for each LUZ.
- Making sure total county level population is the same as total zonal population within that county.
- Calculating the county level average household size, population growth rate and household growth rate.

Running the Population Synthesizer

The synthesis was run for each MPO area separately, with a number of iterations roughly proportional to the MPO population. It should be noted that the samples used are locally relevant (same PUMA and closest 5 others) and the targets were all defined at the county level or finer, so multiple counties could be run in one run simultaneously, but effectively independently. A goodness of fit score is produced by the synthesizer; because the calculation is a multidimensional weighted measure, it is not simply comparable, other than that smaller values are better for any given area. Areas with more complex targets, such as SANDAG and SACOG, will tend to have higher scores as there are more dimensions being evaluated. The results of each synthesis run were reviewed manually to verify that the synthetic population matched the individual targets to the best degree possible. The synthesizer fits were considered acceptable.

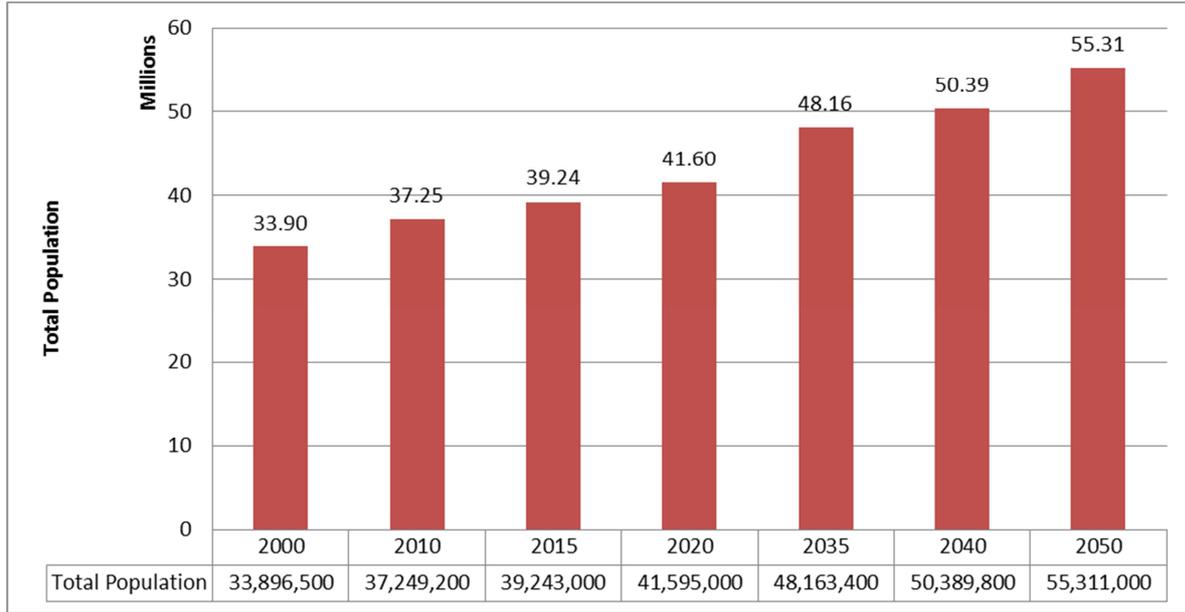
2.4 TOTAL POPULATION FORECASTS BY YEAR

Population and household information for each county was combined to create CSTDM statewide forecasts, as shown in Figure 2.5. Results were checked for reasonableness in a number of areas:

- Growth rates over time, by county and by region
- Plotting population by year for reasonable spatial distribution

Appendix B provides total population for all years at the county level.

Figure 2.6 Total Statewide Population, by Year



3.0 Employment

For CSTDMv2, employment for workers by both industry and occupation was required. The industry categories describe the type of activity at a person’s place of work, and the occupation categories describe the kind of work a person does to earn a living.

For information on industry, the 21 North American Industrial Classification System (NAICS) categories were aggregated to 9 industry categories used in the model, as shown in Table 3.1. The 24 Standard Occupational Classification (SOC) categories for information on occupation were aggregated to 9 occupation categories for the CSTDM, as shown in Table 3.2.

Table 3.1 CSTDM Employment Industry Categories

NAICS	NAICS Category	CSTDM Category
11	Agriculture	Primary/Secondary (PrimSec)
21	Mining	
23	Construction	
31-33	Manufacturing	
42	Wholesale	Wholesale (Whole)
44-45	Retail	Retail
22	Utilities	Transportation/Utilities (Tran_U)
48-49	Transport	
51	Information	Office
52	Finance & Insurance	
53	Real Estate	
54	Professional, School and Technical Service	
55	Management	
56	Administration & Support	
92	Public Administration	
61	Education	Education/Medical (EduMed)
62	Health Care	
71	Arts, Entertainment & Recreation	Leisure/Hospitality (LeisHosp)
72	Accommodation & Food Service	
81	Other Service	Other Service (OthServ)
11	Armed Forces	Military

Table 3.2 CSTDM Employment Occupation Categories

CSTDM Groupings	Occupation	Census Occupation Codes	SOC
ManBus	Management	1-16 & 22-43	11
	Farm Managers	20-21	
	Business and Financial	50-95	13
ProfTech	Computer and Mathematical	100-124	15
	Architecture and Engineering	130-156	17
	Life, Physical and Social Science	160-196	19
	Community and Social Service	200-206	21
	Legal	210-215	23
Education	Education, Training and Library	220 255	25
Health	Healthcare Practitioners and Technical	300-354	29
	Healthcare Support	360-365	31
ServNS	Protective Service	370-395	33
	Building and Grounds Maintenance	420-425	37
	Personal Care and Service	430-465	39
SalesFE	Arts, Design, Entertainment, Sports and Media	260-296	27
	Food Preparation and Serving	400-416	35
	Sales and Related	470-496	41
Clerical	Office and Administration	500-593	43
BluCol	Farming, Fishing and Forestry	600-613	45
	Construction and Extraction	620-694	47
	Installation, Maintenance and Repair	700-762	49
	Production	770-896	51
	Transportation and Material Moving	900-975	53
Military	Armed Forces	980-983	55

3.1 YEAR 2010 EMPLOYMENT

The Census Transportation Planning Package (CTPP) was not available at the time of this project for the year 2010, as it was for the CSTDM09 base year employment for 2000 that was used to develop a synthetic dataset with all employees for 2000. Therefore, a number of data sources were compared and evaluated to determine the best data for this application. Some considerations while evaluating various data sources include the source's definition of a worker or employee and the geographic detail of the location of the place of work.

Data Sources

California Employment Development Department (EDD)

The Division Labor Market Information (LMI) provides data to the public for the Employment Development Department (EDD) on California labor markets. The QCEW, or Quarterly Census of Employment and Wages, release data by industry, including the number of employees in each industry for each county. The QCEW is a program involving the Bureau of Labor Statistics (BLS) of the US Department of Labor and the State Employment Security Agencies (SESAs). Employment and wage information for workers is tabulated for all employees covered by state unemployment insurance (UI) laws and federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program. At the State and area level, the QCEW program publishes employment and wage data down to the 6-digit NAICS industry level, if disclosure restrictions are met. In accordance with BLS policy, data provided to the bureau in confidence are not published and are used only for specified statistical purposes. BLS withholds publication of UI-covered employment and wage data for any industry level when necessary to protect the identity of cooperating employers.

The advantages of the EDD data are that they are based on real employment figures (not synthetically derived). And, while they are published for the 13 industries required for our model, the employment by industry data does not include some portions of the labor force, such as self-employment.

ACS Journey to Work

The ACS produces county-to-county work flows from place of residence to place of work. An advantage of this data is that it is derivative of a household survey and includes all types of employment, an advantage over QCEW employment by industry data. These work flows were used during the SDPTM calibration and were summed at the place of work counties to obtain total employment by county. This data also provides a more internally consistent definition of worker within the CSTDM because ACS data is used for workers on the population/household side. Therefore, ACS Journey to Work data was selected for county-level control totals.

ACS Equal Employment Opportunity (EEO)

The ACS had recently published employment by industry and occupation. The data included this information by place of work as well, whereas it was previously related to household location and not the location of employment.

A disadvantage of the ACS EEO data, in their commitment to protecting the confidentiality of the workforce, is for counties with low numbers of employees for certain industries or occupations where data is not tabulated. Refer above to Table 3-1 for a crosswalk table of NAICS codes and Industries.

Longitudinal Employment and Household Dynamics (LEHD) OnTheMap

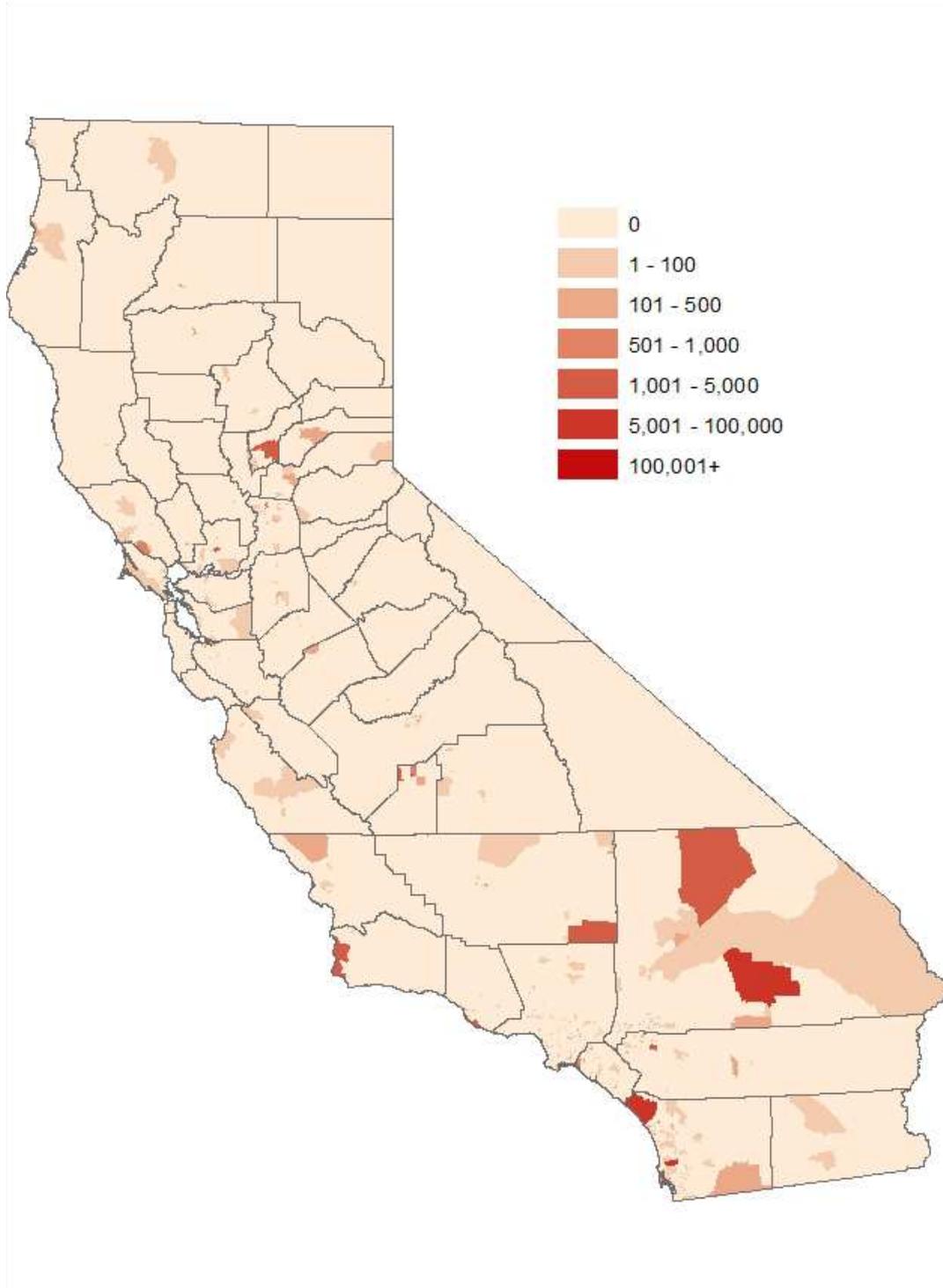
OnTheMap data are a product of the Longitudinal Employment and Household Dynamics (LEHD) project of the US Census Bureau. The LEHD combines federal and state administrative data on employers and employees with census data on where people live, to provide information on home-to-work flows. OnTheMap data are synthesized using Unemployment Insurance Wage Records reported by employers and maintained by each state for the purpose of administering its unemployment insurance system. Each state assigns employer locations, but actual business locations are not used in the dataset to retain the confidentiality of the workforce. Instead, the underlying data are modeled to produce a synthetic dataset which incorporates noise into the data to produce an accurate, but not exact, representation of employment.

The main advantage of OnTheMap data are the geographic units it uses (i.e., census blocks). The disadvantages of using this dataset include the fact that it is a synthetic dataset and that several problems have been identified with the data, especially in the early years of publications (e.g., employees being linked to headquarters of companies rather than branch offices, which overestimates state workers in the state capital) but the industry has recognized the importance of the data and the improvements that have been made over the years, including the data from year 2010.

Military Employment

The project team evaluated each dataset using most of the same industry categories (based from NAICS designations). The single exception is for Military jobs. While CTPP 2000 provides total employment for the military, other datasets (EDD, ACS, and OTM) do not. For this reason, the growth in military employed persons by county between 2000 and 2010 was applied to the year 2000 military employment. Figure 3.1 shows the total military employment for each zone for year 2010.

Figure 3.1 Year 2010 Total Military Employment



Data Processing Method

Employment by Industry

To produce a reasonable estimation of 2010 employee counts by industry, the project team used the following method of combining the data sources described above. Total employment for each county, as reported by the ACS Journey to Work data, provided county-level targets, and the distribution of employment by industry from the ACS EEO data was applied to those ACS Journey to Work totals. However, there were a few counties for which there was no ACS EEO employment by industry. For those counties (less than 1% of the statewide employment), state-level industry distributions were assumed. The final step was to use OTM data to spatially distribute those county-level employment totals by industry to each TAZ.

Employment by Occupation

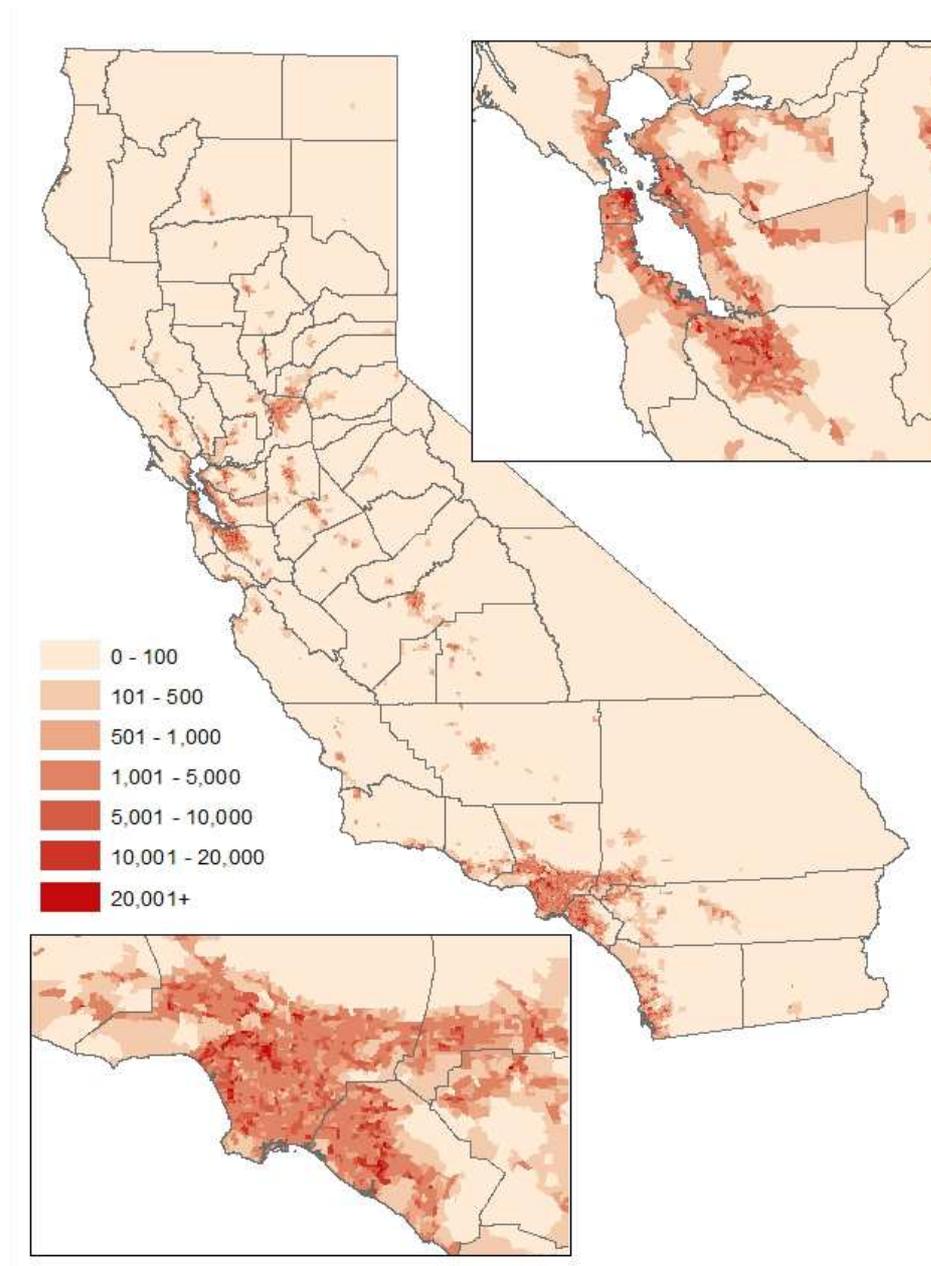
Because many industries have employees involved in many different job-related activities, it is important for the model to consider both industry and occupation. For example, Siemens Manufacturing Facility in Sacramento, CA makes light rail cars and equipment for rail services. This company can include employ Field Service Technicians, who work on-site performing technical maintenance to rail cars and earns a yearly salary of \$40,000, as well as Senior Civil Engineers, who likely work at the office headquarters, manage staff, have a graduate degrees and earn \$120,000 a year. Both employees work in the same industry, but have different daily tasks, different job locations, and different socioeconomic characteristics that affect the model. Thus, understanding industry versus occupation provides important distinctions between employee classifications that would otherwise be generalized.

However, data on occupation is difficult to find, especially at a fine geographic level. The synthetic employment data developed for the Year 2000 CSTDM scenario was utilized to represent occupations at the TAZ level. The occupation by industry rates from the synthetic labor force were applied to the 2010 TAZ employment by industry to obtain an interim estimate of employment by occupation at the TAZ level. Using these rates allows for variability between area type and other occupation predispositions at various geographic locations, which was likely to not change between 2000 and 2010. Trends in occupation have changed, however, between 2000 and 2010. To account for those overall shifts in occupation employment, the interim zonal employment was uniformly adjusted, by county, to match ACS EEO county-level employment totals by occupation.

The control totals by county for each industry and occupation were checked against the resultant base year employment totals for each category, resulting in maximum of 1% for any of the county-level or the statewide control totals. Employment data were plotted for reasonableness, as shown in Figure 3.2. Employment by industry and by occupation were also plotted to visually check

the spatial distribution for reasonableness and in comparison to the Year 2000 data previously produced for the CSTDM09. Appendix C summarizes total employment for each county.

Figure 3.2 Year 2010 Total Employment per Square Mile (Statewide, MTC, and SCAG regions)



3.2 YEAR 2000 EMPLOYMENT

CSTDM09 employment data for Year 2000 was based on EDD QCEW-based data, which did not include self-employment, farm/agriculture, and other types of employment. An interim estimate of total employment was calculated by adding farm employment (from EDD data) and self-employment (a statewide total self-employment estimate was distributed proportional to total county employment). For updated estimates of employment by industry, farm employment was added to the Primary/Secondary Industry and self-employment was distributed to industries based on the following shares:

Table 3.3 Shares of Self-employment by Industry

Self-Employment	
Primary and Secondary Industrial	21%
Wholesale	0%
Transportation-Utilities	4%
Office	34%
Retail	11%
Education-Medical	11%
Leisure Hospitality	8%
Other Service	11%

Source: Based on California's Self-Employed Workforce.³

These totals were then scaled to match ACS Journey to Work assumptions applied to base Year 2010 for Year 2000 conditions. Occupation by industry rates by TAZ from the Year 2000 synthetic labor force developed for CSTDM09 was applied to the updated Year 2000 employment by industry for employment by occupation for all TAZs. The final county total employment for Years 2000 and 2010 were compared to Moody's Analytics employment totals for Years 2000 and 2010 to ensure that they reflected the same trends in employment.

3.3 FUTURE YEAR FORECASTS – EMPLOYMENT

Regional models across the state were estimated and calibrated based on a array of baseline employment assumptions from various data sources. Different methods for tabulating employment included:

- Household Basis – Wage and Salary. This method counts nonfarm full-time or part-time employees that are on the payroll of a private company or

³ <http://www.calmis.ca.gov/file/LFHIST/CA-Self-Employed.pdf>. Accessed August 9, 2013.

government organization. Multiple jobs held by one person are counted as one job with this method. CEF exclusively follows this method. Moody's Analytics follows this method (and the following one).

- Household Basis – Sole Proprietorship and Wage and Salary. This method is the same as the prior one, but also includes the self-employed, unpaid family workers, and private household employees. CSTDM exclusively follows this method. Moody's Analytics also follows this method (and the prior one).
- Establishment Basis. This method counts the number of wage and salary jobs based on the place of work. Individuals holding more than one job (e.g., two or more part-time jobs) are counted for each job. Woods & Poole exclusively follows this method.

Table 3.3 provides a glimpse at how employment totals can vary by data source. In addition to which data source is selected for MPO employment information, some models only include certain industries. These inconsistencies are reasons why the CSTDM cannot assume the exact same employment forecasts as MPOs in all cases.

Table 3.4 Year 2010 Total Employment by Data Source, Select Counties

County	MPO	ACS Journey to Work	Moody's Analytics	EDD (Total Civilian Employment)	EDD (Total for all Industries, with Farm)	ACS EEO	On The Map	MPO Model Data
Statewide		16,189,642	16,063,560	16,051,860	13,996,380	16,130,740	14,460,751	N/A
Alameda	MTC	700,436	676,050	675,500	636,900	701,559	650,526	686,981
Contra Costa	MTC	368,700	465,490	465,100	312,600	369,594	324,527	352,870
Marin	MTC	123,824	122,560	122,500	101,000	124,117	101,476	114,864
Napa	MTC	68,820	68,470	68,400	64,700	68,983	63,119	61,748
San Francisco	MTC	591,192	413,290	413,000	518,800	595,739	560,854	550,363
San Mateo	MTC	350,716	342,370	342,100	315,000	353,918	316,444	331,931
Santa Clara	MTC	915,657	784,680	784,100	846,200	919,778	852,855	811,902
Solano	MTC	141,036	188,960	188,800	118,900	136,669	122,176	132,350
Sonoma	MTC	206,186	229,470	229,300	172,300	206,390	167,697	177,617
Imperial	SCAG	53,269	54,190	54,200	53,500	54,316	58,620	61504*
Los Angeles	SCAG	4,514,908	4,294,200	4,291,400	3,778,700	4,530,900	4,131,408	4,335,967*
Orange	SCAG	1,488,502	1,441,500	1,440,400	1,357,400	1,493,274	1,433,673	1,624,061*
Riverside	SCAG	691,816	802,250	801,600	536,000	693,082	565,555	663,950*
San Bernardino	SCAG	734,040	739,430	738,900	602,000	725,846	618,118	700,603*
Ventura	SCAG	336,950	388,150	387,800	297,200	333,894	286,381	347,720*
San Diego	SANDAG	1,437,572	1,408,170	1,407,100	1,233,000	1,363,679	1,230,279	1,501,080*

* SCAG and SANDAG MPO Model Data is from 2008.

Review of Population Forecasts by MPOs and RTPAs

As with population forecasts, the CSTDM09 employment forecasts were the starting point for developing updated future year forecasts in CSTDMv2. The project team reviewed underlying assumptions from MPO model data and made adjustments to reflect MPO assumed growth projected onto CSTDMv2 base employment. Other considerations in updating future year forecasts based on MPO data were the spatial distribution and the distribution of employment by industry of the employment growth.

AMBAG

Received future year forecasts for AMBAG appeared consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

Butte County

CS received total jobs (non-farm) for Butte County from BCAG for years 2005, 2006, 2010, 2020, and 2035. Adjustments were made to factor up 2020 and 2035 employment to account for farm and self-employment. Year 2020 and 2035 forecasts were then extrapolated out to years 2040 and 2050 for total employment control totals. Year 2010 and 2020 employment was used to interpolate 2015 total employment.

With no better information on where new employment growth will occur in the future, the updated employment control totals were spatial distributed based on the existing distribution.

The total employment for the county was then divided into agriculture/farm, and self-employment, and the remaining employment. Total agriculture/farm employment was estimated from EDD data and assumed to hold constant for all future year forecasts. The non-farm/non-self-employment portion of the employment was assumed to be the forecasted employment from BCAG. The remaining difference was assumed to self-employment and distributed among the employment industries, as described earlier. The non-farm employment was distributed among the different employment industries with the existing year 2010 distribution.

Del Norte County

Received future year forecasts for Del Norte County appeared consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

Humboldt County

Received future year forecasts for Humboldt County appeared consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

MTC

MTC provided the future year employment forecasts for years 2015-2040. The data include employment by industry by zone. Comparison of ACS Journey to Work data and MTC zonal employment for 2010 showed very similar distribution throughout the region. Therefore, the net difference between the two employment sources for 2010 was applied to the MTC forecasts to obtain county control totals.

A crosswalk was created to translate zonal data from MTC TAZs to CSTDM TAZs, based on area allocation. The MTC zonal data in CSTDM TAZs was used to spatially distribute total employment by county to CSTDM TAZs within each county. While MTC does provide employment by industry, only the retail category was compatible with the CSTDM structure. The retail distribution was retained and the remaining employment by industry was distributed based on the previous round of CSTDM forecasts (which had a very similar employment distribution by industry when compared to the updated 2010 existing employment).

SACOG

SACOG provided the future year employment forecasts for years 2008, 2020, and 2035. The data include employment by industry by zone. Comparison of ACS Journey to Work data and MTC zonal employment for 2010 showed very similar distribution throughout the region. Therefore, the net difference between the two employment sources for 2010 was applied to the SACOG forecasts to obtain county control totals.

A crosswalk was created to translate zonal data from SACOG TAZs to CSTDM TAZs, based on area allocation. The SACOG zonal data in CSTDM TAZs was used to spatially distribute total employment by county to CSTDM TAZs within each county. While SACOG does provide employment by industry, the categories were not compatible with the CSTDM structure and could not be used directly. Some SACOG industries were subset or combinations of CSTDM categories and checks were implemented to ensure reasonableness; for example, the SACOG "office" category assumes more employment types based on NAICS sectors and consequently CSTDM office employment should be less than SACOG office employment since it assumes fewer sectors.

SANDAG

Received future year forecasts for SANDAG appeared consistent with the previous round of CSTDM forecasts; therefore, no changes were made and the previous assumptions were retained.

SBCAG

CS received updated zonal travel model employment forecasts for years 2010-2040. The zonal employment data only included wages and salary. SBCAG Growth Forecasts, adopted December 2012 and shown in the RTP, provide land use projections for years 2010-2040 which does include a reporting of the self-employed. For these reasons, the regional growth forecasts and not the model zonal data was assumed for total employment control totals for Santa Barbara County.

A crosswalk was created to translate employment data in SBCAG TAZs to CSTDM TAZs. That zonal employment data from SBCAG in CSTDM TAZs was used to spatially allocated the total county-wide employment and to obtain zonal control totals for employment. This was the best information available as to where new employment was expected to grow.

Zonal model employment data did include employment by industry; however, the industry categories were not compatible with the CSTDM structure. Year 2010 employment by industry distributions were assumed for future year data.

SCAG

SCAG provided the employment data for years 2008, 2012, 2020, and 2035. The data include employment by industry by zone. The zonal employment data only included wages and salary. ACS Journey to Work data was also compiled for years 2008 and 2012, in order to compare to SCAG base year employment. The net difference between the two employment sources for 2012 was applied to the SCAG forecasts to obtain county control totals.

A crosswalk was created to translate zonal data from SCAG TAZs to CSTDM TAZs, based on area allocation. The SCAG zonal data in CSTDM TAZs was used to spatially distribute total employment by employment by county to CSTDM TAZs within each county. SCAG did provide employment by industry, which was compatible with the CSTDM structure, and those distributions were retained for the CSTDM forecasts.

SLOCOG

Although official, updated zonal forecasts were not available with adequate time to be incorporated into the updated version of the CSTDM, documentation on county-level land use projections for years 2010-2040 was available and provided more reasonable assumptions than the previously adopted forecasts. Caltrans agreed to use the updated control totals.

The county-wide employment projections only included non-farm employment and base year totals matched the non-farm employment totals published by EDD. Adjustments were made to the SLOCOG employment to factor up employment for years 2015-2040 to account for farm and self-employment. Year 2035 and 2040 forecasts were then extrapolated out to year 2050 for total employment control totals.

The previous forecasted assumptions from the first version of CSTDM was used to spatially allocate the total county-wide employment, to obtain zonal control totals for employment.

The total employment for the county was then divided into agriculture/farm, and self-employment, and the remaining employment. Total agriculture/farm employment was estimated from EDD data and assumed to hold constant for all future year forecasts. The non-farm/non-self-employment portion of the employment was assumed to be the forecasted employment from SLOCOG. The remaining difference was assumed to self-employment and distributed among the employment industries, as described earlier. The non-farm employment was distributed among the different employment industries with the existing year 2010 distribution.

Tahoe RPA

CS received total jobs (assumed to be non-farm) from Tahoe RPA for years 2010, 2020, and 2035. Adjustments were made to factor up 2020 and 2035 employment to account for farm and self-employment. Year 2020 and 2035 forecasts were then extrapolated out to years 2040 and 2050 for total employment control totals. Year 2010 and 2020 employment was used to interpolate 2015 total employment.

With no better information on where new employment growth will occur in the future, the updated employment control totals were spatial distributed based on the existing distribution. Employment by industry was also based on existing distributions.

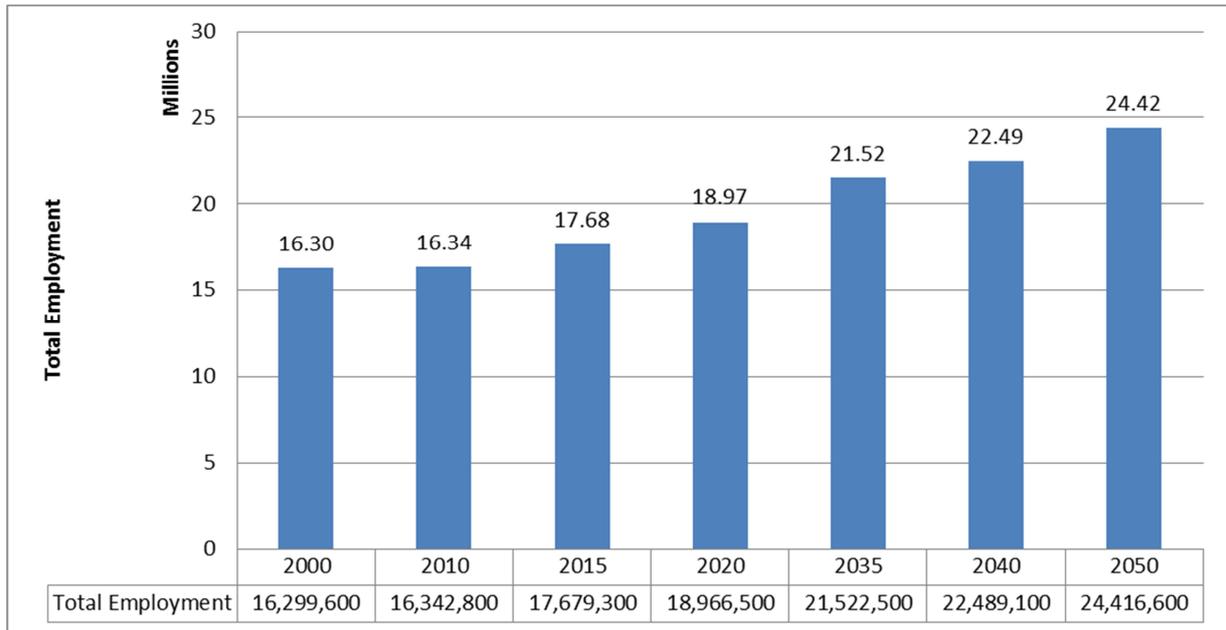
3.4 TOTAL EMPLOYMENT FORECASTS BY YEAR

Employment by industry and occupation for each county was combined to create CSTDM statewide forecasts, as shown in Figure 3.2. Results were checked for reasonableness in a number of areas:

- Future year distribution of employment by industry compared to base year for each county
- Growth rates over time, by county and by region
- Plotting employment by year for reasonable spatial distribution

Appendix C provides total employment for all years at the county level.

Figure 3.3 Total Statewide Employment, by Year



4.0 School Enrollment

For 2010, school enrollment and location data for Kindergarten through 12th grade (K-12) were obtained from the California Department of Education (DOE). Post-secondary education data was obtained from the Integrated Postsecondary Education Data System (IPEDS) Data Center within the National Center for Education Statistics.

4.1 YEAR 2010 SCHOOL ENROLLMENT

After obtaining enrollment information, the GIS coordinates of each institution were used to determine the TAZ. Since the Kindergarten-8th grade (K-8) and 9th grade-12th grade (high school) enrollment information and location information came from two different data sources, the enrollment list was used as the basis for the final data. There were 17,081 schools with location data, while 10,220 schools were found in the enrollment data. This is because the location data set also had schools that were shut down or merged.

There were a total of 327 records referred to as 'Non-public non-sectarian schools' which did not have names in the 'school' field (highlighted in yellow below). Some of these records did have identifying name information in the 'district' field, as shown by some sample records highlighted in green from the screenshot.

For those records which were named 'non-public non-sectarian schools' but had some identifying information in the district field, address/location information was researched and obtained (if available) when enrollment numbers were greater than 50. Enrollment numbers for these cases were generally low.

Compiling the enrollment information for post-secondary enrollment was easier since both enrollment numbers and location numbers came from the same data source. Fall 2010 full-time equivalent (FTE) numbers were used to report enrollment. According to IPEDS, an FTE is described as:

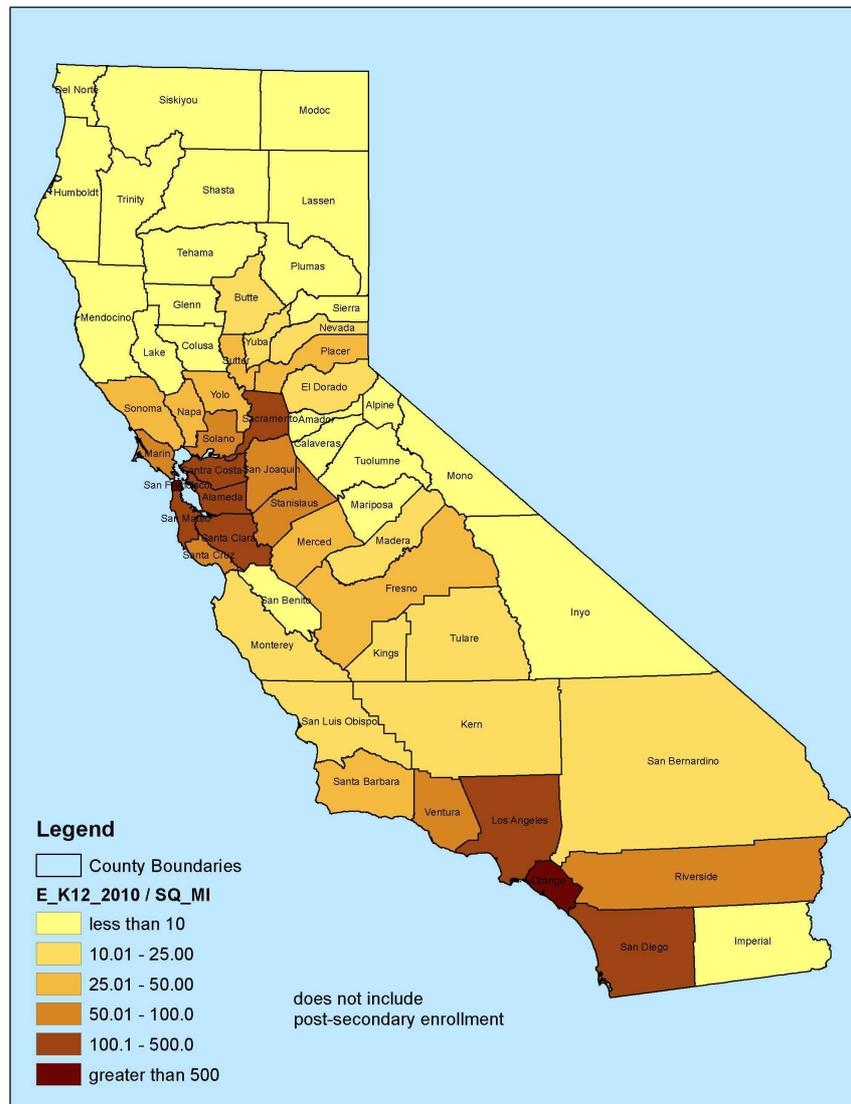
"[D]erived from the enrollment by race/ethnicity section of the fall enrollment survey. The full-time equivalent of the institution's part-time enrollment is estimated and then added to the full-time enrollment of the institution. This formula has been used to produce the full-time equivalent enrollment that is published annually in the Digest of Education Statistics. The full-time equivalent of part-time enrollment is estimated by multiplying the part-time enrollment by factors that vary by control and level of institution and level of student."

After obtaining enrollment numbers, the location information of each post-secondary institution was used to determine in which TAZ the enrollment was

located. Large institutions, such as UC Davis, that spanned across multiple TAZs had their enrollments divided into the containing TAZs proportionally based on area. A total of 747 post-secondary institutions consisting of Public Universities, Private Universities, and Community Colleges were used to compile the data set .

Figure 4.1 shows county-level school enrollment (K-12) per square mile on a map of California.

Figure 4.1 Year 2010 County-level School Enrollment (K-12)



4.2 YEAR 2000 SCHOOL ENROLLMENT

Year 2000 K-12 enrollment data were retained from CSTDM09. CSTDM09 Year 2000 post-secondary enrollment was updated to correct for errors. The post-secondary enrollment was calculated using full-time equivalent enrollment numbers from IPEDS for Year 2000 and applying the exact same methodology as Year 2010, described above. Since Year 2000 IPEDS data did not have coordinates of the institutions, the coordinates were determined from year 2010 dataset as well as looking them up manually from the physical address of the schools.

4.3 FUTURE YEAR FORECASTS – SCHOOL ENROLLMENT

As with population and employment, the CSTDM09 employment forecasts were the starting point for developing updated future year forecasts. Data received from the MTC and SCAG models included projections with school enrollment information and were used to update school enrollment for CSTDMv2.

MTC

MTC model data included the following school enrollment information for years 2010, 2015, 2020, 2035, and 2040 by TAZ:

- Persons age 5-19 (AGE0519)
- Enrolled high school students (HSENROLL)
- Full-time college students (COLLFTE)
- Part-time college students (COLLPTE)

For compatibility with CSTDM inputs (student grades K-8, students grades 9-12, post-secondary students), the following was assumed:

$$E_{K8} \approx AGE0519 - HSENROLL$$

$$E_{912} = HSENROLL$$

$$E_{PSE} = COLLFTE + COLLPTE * 0.5$$

Total growth in number of students by category, compared to MTC's 2010 baseline, was added to the 2010 CSTDMv2 student enrollment to obtain updated forecasted student populations for the MTC region.

SCAG

SCAG model data included the following school enrollment information for years 2012, 2020, and 2035 by TAZ:

- Enrolled students in grades K-12 (K12)

- College students (COLLEGE)

For compatibility with CSTDM inputs (student grades K-8, students grades 9-12, post-secondary students), the following was assumed:

$$E_{K8} + E_{912} = K12$$

$$E_{PSE} = COLLEGE$$

SCAG growth rates were applied to the 2010 CSTDMv2 student enrollment to obtain updated forecasted student populations for the SCAG region. 2010 CSTDMv2 shares of K-8 and 9-12 enrollment was applied to SCAG's K-12 projections.

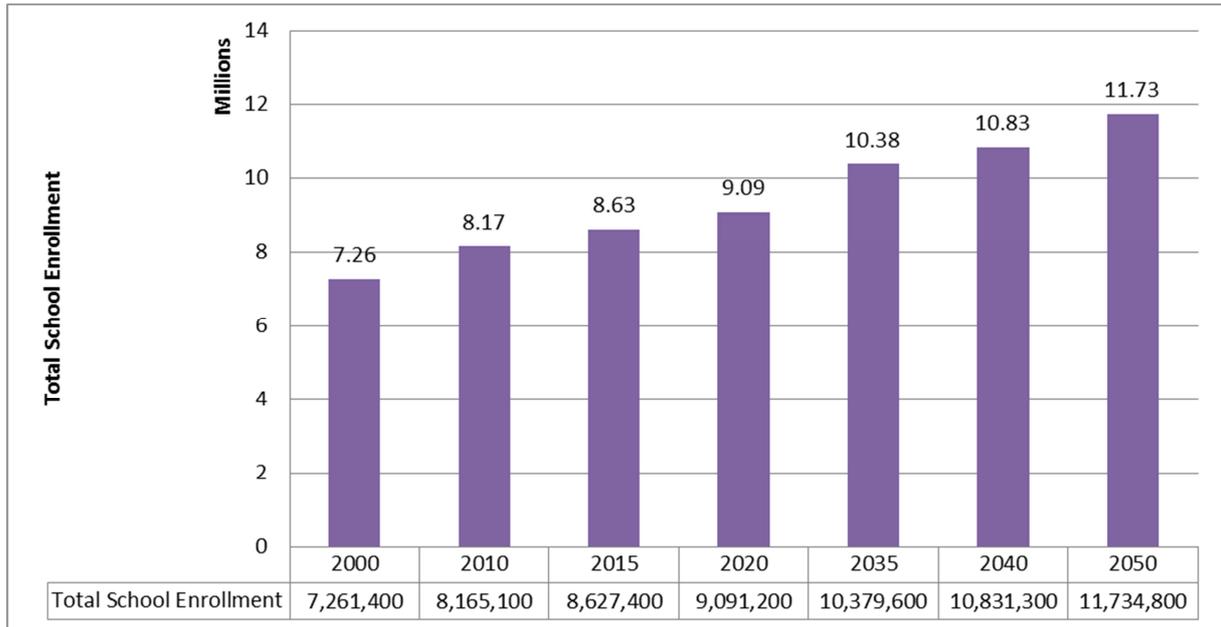
Other Regions

Review of school enrollment data by county for the remaining regions showed reasonable projections, given forecasted population, for all years except 2050. Without better information on Year 2050 school enrollment, control totals were extrapolated based on Year 2035 to Year 2040 growth rates for each county and allocated to TAZs based on Year 2040 spatial distribution.

4.4 TOTAL SCHOOL ENROLLMENT FORECASTS BY YEAR

School enrollment for grades K-8, 9-12, and post-secondary students were combined to create CSTDM statewide forecasts, as shown in Figure 4.2. Appendix D provides total school enrollment for all years at the county level for K-8, 9-12, and post-secondary students.

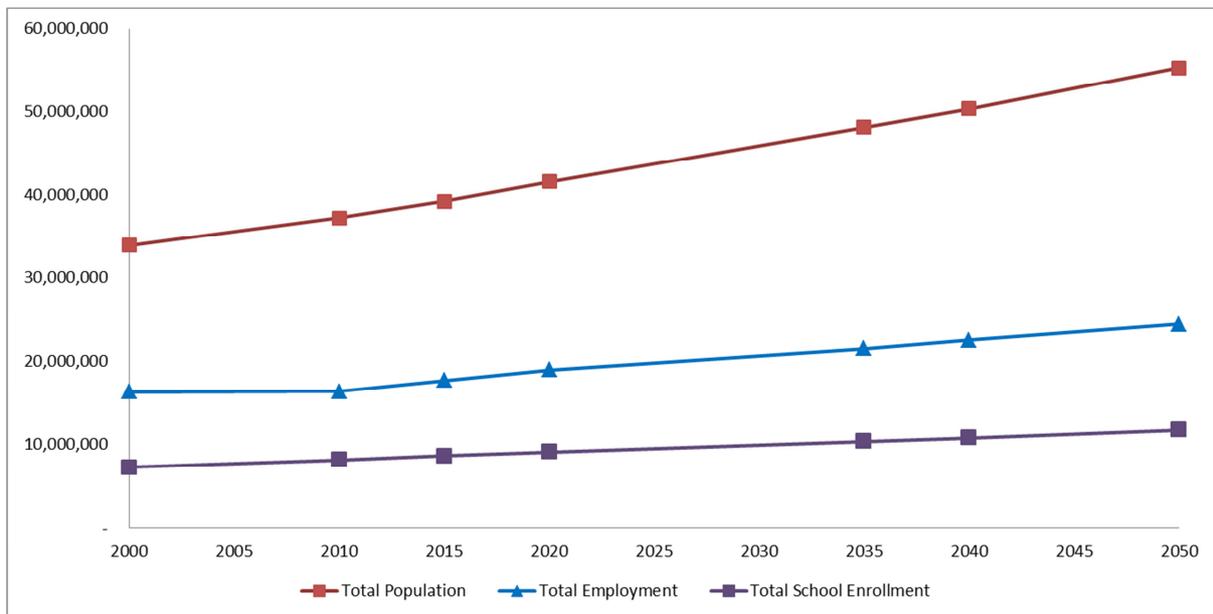
Figure 4.2 Total Statewide School Enrollment, by Year



5.0 Socioeconomic Data Results

Population, employment by industry and occupation, and school enrollment estimates for years 2000, 2010, 2015, 2020, 2035, 2040, and 2050 were updated for CSTDMv2, as shown in Figure 5.1. The projections reflect the most recent MPO forecasts available as of summer 2013.

Figure 5.1 Total Population, Employment, and School Enrollment, by Year



A. Future Year Forecasts Documentation

A.1 RESOURCES

Butte County Association of Governments; *Butte County Long-Term Regional Growth Forecasts 2010-2035*; Chico, CA, January 2011

California Department of Finance; *County Population Estimates and Components of Change by County, 2010-2013, Report E-6*; Sacramento, California, December 2013.

California Employment Development Department; *Industry Employment & Labor Force - by Annual Average, March 2009 Benchmark*; Labor Market Information Division; Sacramento, California; June 18, 2010.

Metropolitan Transportation Commission and Association of Bay Area Governments; *Plan Bay Area, Draft*; Oakland, California; March, 2013.

Moody's Analytics; *U.S. County Forecast Database, California*; July 2013.

Sacramento Area Council of Governments; *Metropolitan Transportation Plan/Sustainable Community Strategy 2035*; Sacramento, California; April 2012.

-; *Projections 1992-2015, Housing Population Employment*; Sacramento, California; February 1994.

-; *SACOG 1995 Regional Housing, Population, & Employment Projections, Documentation & Analysis*; Sacramento, California; February 1996.

Schniepp, Mark; *County-Level Economic & Demographic Forecasts State of California, Methodology Report, Structure of the Model, Model Specification, and Case Study*; California Economic Forecast Project; Santa Barbara, California; May 2000.

Southern California Association of Governments; *Towards a Sustainable Future, 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy, Growth Forecast Appendix*; Los Angeles, California; April 2012.

-; *Making the Connections, 2008 Regional Transportation Plan*; Los Angeles, California; May 2008.

ULTRANS, Institute of Transportation Studies; *CSTD09 - California Statewide Travel Demand Model, Model Development, Population*; University of California at Davis; May 2011

ULTRANS, Institute of Transportation Studies; *CSTD09 - California Statewide Travel Demand Model, Model Development, Employment*; University of California at Davis; May 2011

ULTRANS, Institute of Transportation Studies; CSTDM09 – California Statewide Travel Demand Model, Development of Future Population and Employment; University of California at Davis; January 2012

A.2 REFERENCE LIST OF FORECAST DATA FILES AND REPORTS (MPO/RTPA)

MPO/RTPA	Base Year	Horizon Years	Data Files Used	Zonal Data Available and Used?
Butte County	2010	2020, 2035	<i>Growth_Forecasts_2010-2035.pdf</i> , Medium Scenario	Yes
MTC	2010	2015, 2020, 2035, 2040	tazData_{year}.csv, bayarea_rtaz1454_rev1.shp	Yes
SCAG	2008, 2012			Yes
SACOG	2008	2020, 2035	pa{year}_hmv.dbf, cc{year}_zbas.dbf	Yes
SBCAG	2010	2020, 2035, 2040	tazdata.dbf; <i>Final 2040 Regional Growth Forecasts, 2010-2040</i>	Yes
SLOCOG	2010	2015, 2020, 2025, 2030, 2035, 2040	<i>San Luis Obispo County 2040 Population, Housing, and Employment Forecast, Mid Scenario</i>	No
Tahoe RPA	2010	2020, 2035	<i>Draft Modeling Parameters for Tahoe RTP Evaluation (9/7/2012)</i>	No

A.3 SUMMARY OF ZONAL DATA FROM MPOS AND RTPAS

MPO/RTPA	Population	Households	Employment
MTC	Pop, Age (0-4, 5-19, 20-44, 45-64, 65+), GQ, high school enrollment, college students	HH, EmpRes, SFDU, MFDU, HHINC (<\$25k, \$25k-\$45k, \$45k-\$75k, \$75k+, in \$1989)	Retail; financial and professional services; health, educational, and recreational service; agricultural; manufacturing, wholesale, and transportation; other
SCAG	College students, K-12 students	HHs, SFDU, MFDU, HH Size (1, 2, 3, 4+), Number of workers in HH (1, 2, 3+), HHINC (<\$25k, \$25k-50, \$50k-100, >100k)	Retail, IT, Finance/Real Estate, Prof., Art/Entertainment, Other Service, Edu., Ag., Const., Manuf., Wholesale, Trans., Public Administration
SACOG	College students, K-12 students	HHs, HH Size (1, 2, 3, 4+), Number of workers in HH (1, 2, 3+), HHINC (<\$10k, \$10k-20, \$20k-35, \$35k-50, >\$50k in	Retail, office, medical, education, manufacturing, other

MPO/RTPA	Population	Households	Employment
		1990 \$)	
SBCAG	Pop, Preschool, Elementary, Middle School, High School, College	HH, Income, HH Size, SFDU, MFDU	Agriculture, commercial, industrial, office, s ervice

Acronyms:

Pop	Total population (includes group quarters)
HH	Total households
HHPop	Population in households (excludes group quarters)
HHSize	Number of persons in household
EmpRes	Employed residents/workers in household
SFDU	Occupied single-family dwelling units
MFDU	Occupied multi-family dwelling units
HHINC	Household income (categories)
GQ	Population in group quarters

B. County-level Total Population Forecasts

Total Population						
County	2010	2015	2020	2035	2040	2050
Alameda	1,510,200	1,567,100	1,639,300	1,876,800	1,965,400	2,142,500
Alpine	1,200	1,200	1,200	1,200	1,200	1,100
Amador	38,100	43,900	52,300	63,200	63,800	74,100
Butte	220,000	237,100	254,700	335,500	356,300	412,900
Calaveras	45,600	49,500	53,400	65,500	69,500	77,500
Colusa	21,400	24,000	26,600	33,300	35,700	38,700
Contra Costa	1,049,000	1,079,800	1,117,100	1,271,500	1,328,400	1,442,400
Del Norte	28,600	30,800	33,100	42,700	45,900	53,200
El Dorado	181,100	188,600	192,300	214,000	221,300	235,800
Fresno	930,400	1,057,800	1,185,100	1,518,700	1,650,000	1,932,900
Glenn	28,100	31,300	34,400	46,000	49,900	60,100
Humboldt	134,600	137,500	140,500	147,000	149,100	150,600
Imperial	174,500	208,100	243,700	288,200	303,000	332,600
Inyo	18,500	19,100	19,600	21,900	22,700	24,200
Kern	839,600	925,200	1,010,900	1,321,100	1,424,400	1,846,500
Kings	153,000	174,700	205,700	275,100	293,200	356,800
Lake	64,700	68,700	72,900	99,500	108,400	116,100
Lassen	34,900	36,800	38,700	45,700	48,000	52,300
Los Angeles	9,814,400	10,022,300	10,399,700	11,348,000	11,664,000	12,296,200
Madera	150,900	196,500	242,800	314,100	338,000	387,300
Marin	252,400	250,000	253,900	268,700	274,500	286,000
Mariposa	18,300	19,400	20,600	23,900	25,000	26,900
Mendocino	87,800	87,900	88,400	98,600	102,100	114,600
Merced	255,800	313,700	375,300	486,600	522,600	657,400
Modoc	9,700	10,700	11,700	16,700	18,400	22,700
Mono	14,200	15,700	17,200	25,100	27,800	35,200
Monterey	415,100	444,300	473,500	530,600	549,300	620,400
Napa	136,500	137,300	141,000	153,900	158,800	168,600

Total Population

County	2010	2015	2020	2035	2040	2050
Nevada	98,800	104,000	109,100	121,800	126,100	130,800
Orange	3,010,200	3,114,100	3,266,100	3,421,200	3,472,900	3,576,400
Placer	348,400	376,900	404,000	489,100	517,600	574,700
Plumas	20,000	20,400	20,700	23,200	24,000	26,300
Riverside	2,189,500	2,387,900	2,592,400	3,324,200	3,568,200	4,056,000
Sacramento	1,418,800	1,495,300	1,571,600	1,860,000	1,957,300	2,152,200
San Benito	55,300	64,500	73,700	94,700	101,700	125,300
San Bernardino	2,035,200	2,137,500	2,267,500	2,749,800	2,910,600	3,232,100
San Diego	3,095,200	3,311,900	3,534,600	4,025,400	4,189,500	4,383,800
San Francisco	805,200	841,200	884,200	1,024,000	1,076,300	1,181,100
San Joaquin	685,300	755,100	823,300	1,115,300	1,213,700	1,505,500
San Luis Obispo	269,600	274,200	282,000	318,000	331,000	360,000
San Mateo	718,500	742,200	771,200	864,000	898,700	968,200
Santa Barbara	423,900	429,400	434,900	496,500	509,000	534,000
Santa Clara	1,781,600	1,867,500	1,967,300	2,288,900	2,407,500	2,644,700
Santa Cruz	262,400	269,900	277,500	296,100	301,700	316,900
Shasta	177,200	196,000	214,700	263,300	279,200	325,600
Sierra	3,200	3,200	3,100	2,900	2,800	3,100
Siskiyou	44,900	46,600	48,400	55,300	57,600	63,700
Solano	413,300	416,700	431,200	477,100	494,400	528,900
Sonoma	483,800	496,400	513,200	570,100	591,500	634,300
Stanislaus	514,400	600,400	683,300	907,400	976,200	1,173,400
Sutter	94,700	98,200	102,100	125,300	133,000	148,600
Tehama	63,500	69,900	76,400	97,800	105,000	121,400
Trinity	13,800	15,100	16,500	22,300	24,300	28,400
Tulare	442,200	514,400	586,700	761,800	820,400	974,600
Tuolumne	55,400	70,500	87,200	103,300	109,000	117,500
Ventura	823,300	850,400	889,000	954,300	976,100	1,019,700
Yolo	200,900	214,900	229,900	273,800	288,700	318,700
Yuba	72,200	79,600	87,300	103,400	108,800	119,600
Total	37,249,300	39,243,300	41,594,700	48,163,400	50,389,500	55,311,100

C. County-level Total Employment Forecasts

Total Employment						
County	2010	2015	2020	2035	2040	2050
Alameda	702,200	772,300	842,100	925,900	963,000	1,037,100
Alpine	900	400	400	400	600	1,000
Amador	14,300	14,900	15,400	15,100	15,000	14,700
Butte	85,800	93,700	104,300	134,200	144,800	165,800
Calaveras	11,600	12,600	13,200	13,500	13,500	13,600
Colusa	8,700	12,500	15,400	17,700	17,400	17,000
Contra Costa	369,400	390,700	424,000	465,700	483,500	519,000
Del Norte	8,800	12,000	13,800	16,800	16,200	15,000
El Dorado	55,100	57,800	60,200	72,100	76,400	84,600
Fresno	356,200	423,300	479,700	618,200	671,900	779,300
Glenn	10,300	12,900	14,900	18,700	18,100	17,000
Humboldt	59,200	59,900	65,400	65,000	66,000	68,100
Imperial	53,500	68,300	90,300	109,700	116,200	129,100
Inyo	9,100	9,500	9,700	9,600	9,500	9,400
Kern	306,400	389,700	461,000	577,300	655,100	810,800
Kings	60,400	52,000	52,400	72,300	79,500	94,100
Lake	18,700	21,300	22,300	23,000	23,200	23,500
Lassen	10,200	14,400	17,000	18,800	18,900	19,000
Los Angeles	4,520,500	4,496,600	4,709,700	4,979,100	5,068,900	5,248,600
Madera	43,300	65,800	74,700	91,100	97,700	110,800
Marin	124,000	124,400	129,200	135,600	138,300	143,800
Mariposa	6,300	6,700	7,100	8,300	8,700	9,300
Mendocino	38,700	41,100	41,900	41,200	40,800	39,900
Merced	78,900	86,900	84,900	99,700	111,500	135,000
Modoc	3,200	4,000	4,500	6,100	5,700	5,000
Mono	8,000	9,800	11,600	16,000	16,000	16,000
Monterey	181,100	208,200	218,100	240,500	255,700	286,000
Napa	69,000	82,800	88,300	94,000	96,700	102,000

Total Employment

County	2010	2015	2020	2035	2040	2050
Nevada	37,300	48,500	51,800	54,800	55,900	58,000
Orange	1,491,300	1,459,500	1,531,600	1,684,700	1,735,700	1,837,700
Placer	146,800	155,700	165,700	210,500	225,500	255,200
Plumas	8,400	8,500	8,400	7,500	7,300	6,800
Riverside	697,400	952,100	1,132,200	1,436,200	1,537,500	1,740,200
Sacramento	626,700	650,800	674,600	828,000	879,100	981,400
San Benito	16,700	18,900	19,600	21,700	24,100	29,000
San Bernardino	748,100	859,500	946,700	1,195,700	1,278,700	1,444,600
San Diego	1,519,000	1,566,400	1,619,600	1,813,400	1,876,500	2,003,000
San Francisco	591,500	658,600	712,400	774,100	800,600	853,700
San Joaquin	233,100	254,100	258,700	346,800	388,300	471,200
San Luis Obispo	115,600	122,100	128,600	145,600	151,700	164,000
San Mateo	350,900	394,000	426,700	452,000	464,200	488,400
Santa Barbara	202,500	216,300	232,600	250,000	260,400	276,000
Santa Clara	916,200	1,108,100	1,195,600	1,291,300	1,333,900	1,419,000
Santa Cruz	109,700	131,400	131,600	147,600	151,100	158,000
Shasta	69,600	80,100	88,900	111,400	120,900	140,000
Sierra	1,300	1,300	1,300	1,200	1,200	1,300
Siskiyou	16,500	18,500	20,300	21,600	21,100	20,000
Solano	145,300	158,200	170,100	187,500	195,000	209,900
Sonoma	206,900	237,500	255,400	277,100	286,800	306,000
Stanislaus	182,400	218,500	238,500	355,100	390,100	460,100
Sutter	30,300	30,700	31,700	41,800	45,200	51,900
Tehama	19,500	31,400	41,100	46,300	46,600	47,000
Trinity	4,800	4,300	4,500	5,800	5,600	5,000
Tulare	155,300	198,200	222,600	277,000	303,000	355,100
Tuolumne	20,500	22,400	22,600	21,000	20,400	19,300
Ventura	341,300	399,000	425,700	457,500	468,100	489,300
Yolo	97,900	102,200	106,800	134,500	143,700	162,100
Yuba	24,800	26,500	27,500	37,700	41,100	47,800
Total	16,341,500	17,677,900	18,965,100	21,521,000	22,487,600	24,415,100

D. County-level School Enrollment Forecasts

Total School Enrollment (K-8)						
County	2010	2015	2020	2035	2040	2050
Alameda	151,800	148,400	147,900	150,400	159,600	167,100
Alpine	100	100	100	100	100	100
Amador	3,000	2,800	3,300	3,700	4,800	5,200
Butte	22,200	20,800	25,800	30,900	39,100	41,900
Calaveras	4,400	3,900	4,600	5,200	6,300	6,800
Colusa	2,900	3,300	3,900	4,600	5,600	6,100
Contra Costa	108,400	115,100	113,200	114,700	133,300	139,400
Del Norte	3,200	2,800	3,900	5,000	6,000	6,700
El Dorado	17,700	21,100	21,000	20,200	22,700	24,200
Fresno	127,500	134,000	168,200	202,400	238,400	250,600
Glenn	3,900	3,200	3,500	3,800	4,800	5,200
Humboldt	13,200	12,400	12,400	12,400	12,100	14,500
Imperial	23,200	25,600	30,500	35,500	37,500	38,200
Inyo	2,200	1,800	1,200	600	700	700
Kern	100,800	119,200	135,300	151,400	213,400	234,000
Kings	17,700	19,900	30,500	41,100	47,100	49,100
Lake	6,800	5,700	6,300	7,000	7,000	7,000
Lassen	3,500	3,100	3,400	3,800	4,400	5,000
Los Angeles	1,174,000	1,062,200	1,084,100	1,101,700	1,169,000	1,191,500
Madera	16,100	21,000	31,700	42,500	41,300	41,900
Marin	19,800	21,700	21,400	18,900	20,100	20,500
Mariposa	1,700	1,400	1,500	1,500	1,500	1,600
Mendocino	10,200	8,700	9,300	9,800	10,100	10,200
Merced	34,800	37,800	54,200	70,700	75,100	76,600
Modoc	1,300	800	900	1,100	1,600	1,800
Mono	1,300	1,200	1,500	1,800	3,000	3,400
Monterey	50,700	52,700	58,700	64,800	72,600	75,600
Napa	13,200	14,000	14,000	13,900	15,400	15,900

Total School Enrollment (K-8)

County	2010	2015	2020	2035	2040	2050
Nevada	9,600	9,100	9,600	10,100	10,900	13,000
Orange	346,600	336,200	344,700	352,100	361,300	364,400
Placer	32,600	42,200	43,900	45,600	52,100	54,500
Plumas	1,800	1,500	1,700	1,800	1,900	2,000
Riverside	222,300	288,400	344,700	401,300	491,400	521,500
Sacramento	155,500	163,100	180,000	197,500	237,700	251,100
San Benito	7,600	7,200	8,500	9,800	12,700	13,700
San Bernardino	268,500	278,700	293,600	308,100	362,700	380,900
San Diego	337,100	332,800	369,700	406,400	432,600	441,600
San Francisco	40,200	37,600	38,800	33,900	57,400	60,600
San Joaquin	82,900	94,200	145,900	197,600	243,300	258,500
San Luis Obispo	24,100	22,800	23,600	24,300	24,300	24,300
San Mateo	61,700	63,700	65,000	63,800	69,700	72,600
Santa Barbara	46,600	45,400	46,300	47,100	66,900	73,400
Santa Clara	171,900	186,500	195,000	192,800	213,900	224,400
Santa Cruz	24,300	24,600	28,000	31,400	31,600	32,000
Shasta	18,800	18,000	22,700	27,300	31,300	33,300
Sierra	500	300	300	300	400	400
Siskiyou	4,800	4,300	4,900	5,500	5,800	6,200
Solano	48,800	44,400	42,700	43,600	48,100	49,900
Sonoma	49,200	48,500	47,100	47,900	50,100	52,100
Stanislaus	58,400	71,900	116,900	161,900	191,300	201,100
Sutter	11,100	13,900	13,400	12,900	13,400	13,500
Tehama	7,400	8,100	9,200	10,400	12,600	13,700
Trinity	1,300	1,100	1,200	1,300	1,800	2,000
Tulare	60,300	69,700	98,300	126,800	141,000	145,800
Tuolumne	5,000	3,800	7,100	10,400	12,000	12,500
Ventura	96,300	103,200	106,500	109,700	116,300	118,500
Yolo	20,100	20,200	22,800	25,300	29,500	30,900
Yuba	8,300	9,900	10,400	10,900	13,500	14,300
Total	4,159,200	4,216,000	4,634,800	5,037,300	5,690,100	5,923,500

Total School Enrollment (9-12)

County	2010	2015	2020	2035	2040	2050
Alameda	55,900	66,900	66,400	67,300	71,000	74,100
Alpine	0	0	0	0	0	0
Amador	1,600	1,500	2,000	2,500	3,300	3,600
Butte	10,800	10,400	12,400	14,400	17,900	19,100
Calaveras	2,200	2,200	2,200	2,100	3,300	3,600
Colusa	1,400	1,500	1,600	1,800	2,200	2,400
Contra Costa	45,000	52,700	51,800	52,400	60,500	63,100
Del Norte	1,400	1,500	1,500	1,500	2,400	2,700
El Dorado	8,600	9,500	10,100	10,600	12,200	12,700
Fresno	51,000	59,600	65,800	72,000	117,500	132,700
Glenn	1,700	1,700	1,600	1,500	2,200	2,400
Humboldt	6,700	5,700	6,200	6,700	7,300	7,500
Imperial	9,700	11,800	13,900	16,100	17,000	17,300
Inyo	1,100	1,000	600	300	300	400
Kern	40,100	53,600	59,600	65,600	94,300	103,900
Kings	6,200	8,200	10,800	13,400	20,600	22,900
Lake	3,000	3,000	3,200	3,400	3,400	3,400
Lassen	1,600	1,800	1,600	1,400	2,000	2,100
Los Angeles	424,400	524,800	503,300	486,000	515,800	525,700
Madera	6,400	9,000	16,500	23,900	19,600	19,600
Marin	8,300	8,800	8,600	7,600	8,100	8,300
Mariposa	800	700	700	600	800	900
Mendocino	5,000	4,300	4,500	4,700	4,800	4,900
Merced	14,200	17,700	21,200	24,700	35,700	39,400
Modoc	500	400	400	400	700	700
Mono	500	500	600	700	1,300	1,500
Monterey	18,800	20,500	22,000	23,400	24,500	24,900
Napa	5,600	6,600	6,600	6,500	7,200	7,400
Nevada	5,600	4,800	5,000	5,200	6,300	6,700
Orange	135,200	167,900	159,100	151,300	155,300	156,600
Placer	16,400	20,000	19,900	19,800	20,300	20,500
Plumas	1,100	800	700	700	1,100	1,200
Riverside	88,000	135,800	144,400	152,600	186,900	198,300

Total School Enrollment (9-12)

County	2010	2015	2020	2035	2040	2050
Sacramento	58,900	77,300	88,500	99,700	127,500	136,800
San Benito	3,200	3,500	4,000	4,400	5,900	6,400
San Bernardino	101,600	133,400	134,700	136,300	160,500	168,500
San Diego	130,600	161,700	172,300	182,800	199,500	205,000
San Francisco	17,400	19,300	19,800	17,200	28,900	30,500
San Joaquin	32,500	41,800	53,400	64,900	97,100	107,900
San Luis Obispo	11,400	11,500	11,700	11,800	11,800	11,800
San Mateo	25,600	27,200	27,700	27,100	29,600	30,800
Santa Barbara	18,000	20,700	23,200	25,700	26,700	27,000
Santa Clara	70,800	78,900	82,100	80,900	89,200	93,400
Santa Cruz	11,700	11,900	12,400	13,000	14,400	14,900
Shasta	9,500	9,300	10,500	11,800	15,200	16,400
Sierra	300	100	100	100	100	100
Siskiyou	2,600	2,100	2,000	1,900	2,800	3,100
Solano	21,800	21,100	20,200	20,600	22,500	23,300
Sonoma	21,600	22,200	21,500	21,800	22,600	23,500
Stanislaus	23,300	32,600	42,700	52,800	80,000	89,100
Sutter	4,600	6,200	6,400	6,600	6,800	6,800
Tehama	3,300	3,200	3,300	3,400	4,900	5,500
Trinity	800	600	600	600	1,000	1,100
Tulare	22,800	28,100	32,900	37,700	61,200	69,000
Tuolumne	2,800	2,100	2,800	3,500	4,100	4,300
Ventura	39,800	48,700	47,300	46,100	48,900	49,800
Yolo	8,700	9,700	10,500	11,300	13,100	13,700
Yuba	3,400	4,100	3,800	3,600	3,800	3,800
Total	1,625,800	1,992,500	2,059,200	2,126,700	2,503,900	2,633,000

Total School Enrollment (Post-secondary)

County	2010	2015	2020	2035	2040	2050
Alameda	85,600	98,000	98,000	100,400	122,200	128,400
Alpine	0	0	0	0	0	0
Amador	0	0	0	0	0	0
Butte	22,000	23,800	26,500	29,300	33,900	35,400
Calaveras	0	0	0	0	0	0
Colusa	0	0	0	0	0	0
Contra Costa	20,700	29,700	29,400	30,400	34,600	36,300
Del Norte	0	0	0	0	0	0
El Dorado	1,300	1,500	1,500	1,600	1,900	2,000
Fresno	40,500	55,600	45,200	34,700	50,100	55,200
Glenn	0	0	0	0	0	0
Humboldt	11,400	11,900	9,900	7,900	7,800	7,800
Imperial	3,900	7,000	8,000	9,100	10,600	11,100
Inyo	0	0	0	0	0	0
Kern	18,100	29,400	34,700	40,100	54,300	59,000
Kings	0	2,200	2,500	2,700	5,300	6,100
Lake	19,700	0	900	1,800	1,800	1,800
Lassen	1,100	1,500	1,300	1,200	1,300	1,400
Los Angeles	374,500	555,500	555,500	555,500	566,400	570,100
Madera	0	100	0	0	0	0
Marin	5,500	5,500	4,700	4,600	5,100	5,200
Mariposa	0	0	0	0	0	0
Mendocino	1,900	2,400	5,600	8,800	8,900	8,900
Merced	5,900	12,000	12,000	12,000	16,900	18,500
Modoc	0	0	0	0	0	0
Mono	0	0	0	0	0	0
Monterey	10,900	19,300	15,400	11,400	13,800	14,600
Napa	3,800	4,700	4,600	4,700	5,200	5,300
Nevada	0	0	0	0	0	0
Orange	164,700	195,000	195,000	195,000	198,800	200,100
Placer	10,100	13,600	14,000	14,400	16,500	17,200
Plumas	700	1,000	900	800	1,300	1,400
Riverside	47,900	67,800	75,200	82,500	113,200	123,400

Total School Enrollment (Post-secondary)

County	2010	2015	2020	2035	2040	2050
Sacramento	53,700	83,500	87,100	90,600	103,900	108,400
San Benito	0	0	0	0	0	0
San Bernardino	52,700	74,100	75,800	77,500	94,400	100,000
San Diego	151,500	191,500	166,800	142,100	158,900	164,500
San Francisco	55,300	80,600	79,200	81,000	95,400	101,000
San Joaquin	17,800	22,500	23,000	23,400	41,800	47,900
San Luis Obispo	18,700	25,400	26,000	26,500	26,500	26,500
San Mateo	14,800	15,900	15,500	15,500	17,500	18,200
Santa Barbara	40,900	44,600	39,200	33,700	27,000	27,000
Santa Clara	79,100	110,000	107,700	112,800	137,500	145,400
Santa Cruz	24,800	26,200	22,800	19,500	19,500	19,500
Shasta	6,700	7,200	7,100	6,900	9,200	10,000
Sierra	0	0	0	0	0	0
Siskiyou	1,100	1,500	1,400	1,200	1,700	1,900
Solano	7,000	9,100	8,600	8,900	9,700	10,100
Sonoma	19,600	22,100	21,500	21,700	22,300	23,300
Stanislaus	14,700	20,700	21,200	21,800	33,200	37,000
Sutter	0	200	700	1,100	2,500	3,000
Tehama	0	0	0	0	0	0
Trinity	0	0	0	0	0	0
Tulare	10,000	14,000	15,200	16,400	25,800	28,900
Tuolumne	1,400	1,800	1,700	1,500	1,500	1,500
Ventura	23,000	30,200	31,300	32,400	38,300	40,300
Yolo	28,200	33,900	35,100	36,300	40,700	42,100
Yuba	5,400	4,600	6,000	7,400	8,500	8,900
Total	1,476,600	1,957,100	1,933,700	1,927,100	2,185,700	2,274,600