



**California Public Employees'  
Retirement System**

**Parallel Valuation and  
Certification of the Actuarial  
Valuations  
of the CalPERS Contracting  
Public Agency Plans as of June 30,  
2011**

**Produced by Cheiron  
September 3, 2013**



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## LETTER OF TRANSMITTAL

September 3, 2013

Board of Administration  
California Public Employees' Retirement System  
P.O. Box 942701  
Sacramento, CA 94229-2701

Dear Trustees:

Under the terms of Contract 2009-5377, we have performed an actuarial audit of the Pension Plans for Contracting Public Agencies of the California Public Employees' Retirement System (CalPERS) as of June 30, 2011. The purpose of this audit was to validate independently the actuarial valuations of these plans performed by CalPERS staff actuaries as of the same date, and to identify any potential problems or issues.

As a result of our efforts, we are able to certify that the liabilities and costs computed in the staff valuations as of June 30, 2011 are reasonably accurate and were computed in accordance with generally accepted actuarial principles. In this Report we identify some areas in which procedures and computations could be improved; however, the impact of such changes on liabilities and costs is not material.

This Report was prepared for the Board of Administration for the purposes described herein and for the use by CalPERS staff in assessing their systems, procedures, and computations. This letter is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

To the best of our knowledge, this Report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

Sincerely,  
Cheiron



Robert McCrory, FSA, CERA  
Principal Consulting Actuary

## Overview

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Under Task 4 of Contract 2009-5377, Cheiron, Inc. (Cheiron) has conducted independent actuarial valuations as of June 30, 2011 of a sample of the Pension Plans for Contracting Public Agencies of the California Public Employees' Retirement System (CalPERS). The purpose of these valuations was to validate the actuarial valuations of these plans performed by CalPERS staff actuaries as of the same date, and to identify any potential problems or issues.

As a result of our efforts, we are able to certify that the liabilities and costs computed in the staff valuations as of June 30, 2011 are reasonably accurate and were computed in accordance with generally accepted actuarial principles.

Based on the data, assumptions, and methods employed in the staff valuations, the actuarial liabilities and normal costs independently computed by Cheiron were within 5% of those in the staff valuations in all cases. The total employer contribution rate was within 5% in most cases as well. Exceptions are described below.

## Methodology

This parallel valuation and certification involves three steps:

- Review of Methods and Assumptions

The actuarial assumptions and methods employed in the public agency valuations were reviewed by Cheiron in order to establish whether they meet acceptable standards of actuarial practice.

The staff valuations as of June 30, 2011 incorporated updated actuarial assumptions, as well as a temporary modification to the asset smoothing and amortization of gains and losses following the June 30, 2009 valuation. These changes in assumptions and methodology were reviewed as well.

- Independent Parallel Valuation

In order to verify the calculations in the public agency valuations, Cheiron conducted independent, parallel valuations using its own actuarial models. These independent valuations determine whether actuarial assumptions and methods are applied properly and yield the reported results.

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In preparing our parallel valuations, we relied on member and asset data supplied by CalPERS staff. This data was neither audited nor independently verified. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice #23.

The Cheiron actuarial model used to run the parallel valuations was specifically designed for auditing the CalPERS public agency plans. The Cheiron model is a traditional closed group, seriatim, deterministic, liability-based model.

Parallel valuations were conducted for twenty-three participating non-pooled public agency plans and two risk pools (one miscellaneous and one safety). The ten largest non-pooled public agency plans were selected by CalPERS based on the number of active members. Another thirteen non-pooled plans were selected at random. Risk pools that were not subject to audit as of June 30, 2008 were selected for this project.

- Reconciliation of Results

In the event that the costs computed by Cheiron differ by more than 5% from those computed by CalPERS' staff, a reconciliation is required. This reconciliation proceeds in three steps:

1. Establishing that the same member data and plan provisions have been used by Cheiron and by staff;
2. Researching methodological differences between the Cheiron and staff approaches to computing liabilities and costs; and
3. Comparing individual test life results to uncover subtle differences in approach that may result in material differences in liabilities and costs.

This Report concerns itself with the computation of liabilities and costs relying on the available member data; prior reports prepared by EFI Actuaries (before its merger with Cheiron) have had the same focus. Based on the project parameters specified by the Board and staff, the issue of the accuracy of the underlying member data has been and continues to be excluded from our analysis.

The appendices at the end of this Report summarize the results of the parallel valuations of the public agency plans and risk pools.

## **Review of Methods and Assumptions**

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The actuarial methods and assumptions used in the public agency valuations are within acceptable standards of actuarial practice.

Actuarial assumptions used to compute System liabilities and employer costs include:

- A 7.5% annual rate of investment return, net of all expenses;
- 3.00% payroll growth, used in projecting the payroll over which the unfunded liability is amortized;
- Annual inflation of 2.75%
- Active and retired mortality rates developed based on actual CalPERS experience during the period from 1997 to 2007.

More detailed information concerning the valuation assumptions can be found in the CalPERS Experience Study from 1997 to 2007 issued by CalPERS in 2010. The results of this report were peer reviewed by EFI Actuaries, and also verified by Gabriel Roeder Smith as part of an independent audit of the experience study. Both reviews found the assumptions recommended as part of the study to be reasonable.

CalPERS staff calculated liabilities and contribution rates including the possible impact of benefit limitations under Internal Revenue Code Section 415. The June 30, 2008 valuation that EFI Actuaries audited ignored these benefit limitations. We have made some comments in our Reconciliation of Results about the implementation of these benefit limitations. The effect of this Code section on liabilities and costs is negligible.

## Parallel Valuation Results

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### Individual Plans

Our actuarial model allows us to compare many of our calculations to the figures shown in the CalPERS valuation reports. To assess overall reasonableness of the CalPERS figures, we focused on four specific actuarial calculations:

1. **Total Present Value of Future Payroll** – This is the present value of all pay expected to be paid to currently active members during their working lifetimes within CalPERS. A close match here indicates that the actuarial assumptions were likely to have been programmed and computed correctly.
2. **Total Present Value of Benefits** – This represents the present value of all benefits expected to be paid to all current members after they leave active employment. A close match here also indicates that the actuarial assumptions were likely to have been programmed and computed correctly, and it also indicates that benefit provisions have been properly applied.
3. **Total Actuarial Accrued Liability** – This is the portion of the Present Value of benefits that is allocated to past service (benefits that are deemed to have been earned in the past). A close match here indicates that the actuarial cost method (Entry Age Normal) has been applied properly.
4. **Total Normal Cost** – This represents the present value of benefits deemed to be earned during the current year. A close match here indicates that annual benefit cost is being correctly computed according to actuarial cost method, and that employers are being charged the proper amount (total actuarial cost less employee contributions).

Table 1 below summarizes the comparison of these four calculations derived independently by Cheiron with those reported within the CalPERS valuation reports.

As shown in Table 1, our independent valuation results for the four key measures described above are within 5% for all of the plans within the audit, without exception. The same is true for the two risk pools. Furthermore, results were within 3% for all but one measure relating to one plan. Accordingly, we are able to confidently certify the results of the actuarial valuations as of June 30, 2011.

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**Table 1: Summary of Comparison of Key Actuarial Calculations**

<b>Actuarial Calculation</b>	<b>Proportion of Audited Agencies within 1%</b>	<b>Proportion of Audited Agencies within 3%</b>	<b>Proportion of Audited Agencies within 5%</b>
Total Present Value of Future Payroll	96%	100%	100%
Total Present Value of Benefits	80%	100%	100%
Total Actuarial Accrued Liability	64%	100%	100%
Total Normal Cost	48%	96%	100%

When we compare the total employer contribution rate, the following valuations fell outside of the pre-established 5% tolerance. Reasons for this are described in the Reconciliation of Results.

- City of Long Beach, Safety
- County of Riverside, Safety
- Santa Clara County Central Fire Protection District, Safety

In the above cases, the four key measures described above are within a 2.6% tolerance and the differences in the employer contribution rates are a result of sensitivities rather than material differences. Accordingly, we feel no hesitation in confirming the results of the CalPERS staff valuations for these plans.

These plans are discussed in more detail below in the Reconciliation of Results.

**Risk Pools**

Many of the public agency plans within CalPERS have been combined into risk pools, primarily based on benefit formula. The computation of cost for a plan within a risk pool is comprised of three components: An amortization of a side fund created at entry into the pool, normal cost, and amortization of the pool’s unfunded actuarial accrued liability since pool entry.

The normal cost for a given agency is determined based on the pool at large, with additional surcharges for Class 1 benefits as applicable. Class 1 benefits include cost of living adjustments (COLAs) above 2%, automatic post-retirement survivor allowances (PRSAs) paid by the employer, and an average final pay period of one year.

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To verify the actuarial liabilities and costs for an entire risk pool, a parallel valuation is conducted in the same manner as is done for the non-pooled plans (described above). We conducted parallel valuations for one miscellaneous risk pool (2% at 55, Pool 2) and one safety risk pool (2% at 50, Pool 7). The actuarial liabilities and costs measured by Cheiron were within the 5% of those measured by CalPERS staff for both pools. More detail is provided in the Reconciliation of Results section of this Report.

The most important calculation for the plans within risk pools is the determination of normal cost, since it comprises the majority of the employer cost. Accordingly, we reviewed normal costs and common surcharges for Class 1 benefits, as shown in the valuation reports for Pools 2 and 7. We verified both the gross normal cost (with all applicable Class 1 benefits) and the net normal cost (with no Class 1 benefits) for each of the selected risk pools.

The employer normal cost is the difference between the total normal cost and employee contributions; accordingly, small changes in the total normal cost result in much larger changes in the net employer normal cost. To compensate for this leveraging, we calibrated all of our normal cost calculations by applying the ratio of CalPERS gross normal cost to Cheiron gross normal cost. A comparison was done based on these calibrated results and, as shown in Table 2, all of the calculations were within a 5% tolerance.

**Table 2: Comparison of Risk Pool Surcharges**

	CalPERS Report	Cheiron Calculation	Cheiron Calculation, Calibrated	Ratio of Cheiron Calibrated to CalPERS
<b>Employer Normal Cost Rates for Miscellaneous Pool 2% at 55</b>				
Total (Gross)	8.691%	8.405%	8.691%	100.0%
Net (no Class 1 Benefits)	8.052%	7.724%	7.987%	99.2%
Net, with One Year Final Average Pay*	8.551%	8.207%	8.487%	99.3%
Net, with 3% COLA*	8.980%	8.643%	8.938%	99.5%
Net, with 50% PRSA*	8.874%	8.637%	8.932%	100.6%
<b>Employer Normal Cost Rates for Safety Pool 2% at 50</b>				
Total (Gross)	15.353%	15.633%	15.353%	100.0%
Net (no Class 1 Benefits)	14.641%	14.896%	14.628%	99.9%
Net, with One Year Final Average Pay*	15.483%	15.749%	15.466%	99.9%
Net, with 3% COLA*	16.396%	16.729%	16.429%	100.2%
Net, with 50% PRSA*	16.044%	16.542%	16.246%	101.3%

\* CalPERS amount = Net normal cost rate, plus surcharge rate.

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**Reconciliation of Results**

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As shown above, the actuarial liabilities, present values, and total normal costs calculated independently by Cheiron are within 5% of those calculated by CalPERS Actuarial Valuation System (AVS) in all cases. The reasons for the differences in total cost for the plans listed below is the sensitivity of their employer contribution rates to changes in accrued liabilities and total normal costs.

Several of the agencies have funding ratios (Assets / Accrued Liability) as of June 30, 2011 that were very close to 100%, which increases the sensitivity of employer contribution rates to changes in actuarial accrued liability (AAL). For example, a 1% increase in AAL for the City of Long Beach Safety plan as of June 30, 2011 would have increased the amortization rate by over 22%, and the total contribution rate by 8.7% (relative). This sensitivity has a similar effect on our independent cost comparisons, occasionally causing an apparent material difference in employer contribution rates (over 5%) even when the underlying liability computed by Cheiron is very close to that reported by CalPERS.

A similar sensitivity occurs with the employer portion of the normal cost. This is especially true when the employer and employee portions of the normal cost are approximately equal, or when the employer portion is lower. For example, the Coachella Valley Water District has employee and employer portions of normal cost that are approximately equal. Therefore, for every 1% change in the total normal cost, the employer portion changes by 2%.

**Table 3: Audited Agencies with Employer Contribution Rates Outside of Tolerances**

<b>Ratio of Cheiron Calculation to CalPERS Report</b>					
<b>Agency</b>	<b>Total Normal Cost</b>	<b>Employer Normal Cost</b>	<b>Actuarial Accrued Liability (AAL)</b>	<b>Amortization of UAAL</b>	<b>Employer Contribution Rate</b>
City of Long Beach (Safety)	101.6%	102.4%	102.6%	158.2%	124.3%
County of Riverside (Safety)	101.5%	102.3%	101.9%	113.3%	105.0%
Santa Clara County Central Fire Protection District (Safety)	101.0%	101.5%	101.9%	109.6%	105.2%

This issue has appeared in the past, and is always prone to cause anomalies within the audit. It is also important to keep in mind that the same forces cause actual plan costs for many agencies to be sensitive to annual gains and losses.

In the course of preparing this Report, a number of minor issues arose that should be considered by the staff of the Actuarial Office.

### **Benefit Limits under Section 415 of the Internal Revenue Code**

While reviewing the CalPERS liability calculations for some Safety members, we found that Industrial Disability, Industrial Death, and Vested Deferred benefits were often less than expected based on member age. Discussions with the CalPERS actuarial office confirmed that this was a result of the application of limits on benefits under Section 415 of the Internal Revenue Code (Section 415 limits).

The CalPERS actuarial office confirmed that the limits were applied correctly to safety members with 15 or more years of service, but not to the pre-retirement death survivor's allowance or to disability retirements before age 62. The CalPERS actuarial office stated that this has been fixed for the June 30, 2012 actuarial valuations.

The CalPERS actuarial office also stated the 415 limit for Vested Deferred benefits was being reduced for commencement prior to the deferral age and would require correction in future valuations.

We did a small sampling of plans and estimated that revising these 415 limits would have a minor impact, increasing Present Value of Benefits and Actuarial Accrued Liabilities by less than 0.2%, and increasing plan cost by less than 0.2% of payroll.

### **Deferred Domestic Relations Orders**

The CalPERS actuarial office provided Cheiron with a test computation for a deferred Domestic Relations Order (DRO) in which the 66 year-old member's 47 year-old former spouse was scheduled to begin receiving a benefit at age 80. The CalPERS actuarial office confirmed the following:

*Alternate payees follow the same retirement pattern as the member. However, the retirement pattern is based on entry date, which is a field that is NOT populated for alternate payees so the person "falls" through the valuation until we decrement them out at age 80. We will need to develop a policy on how to handle these cases and then implement the solution in future valuations.*

As deferred DROs are a very small subset of total liabilities, we estimate this will have a minor overall impact, but should be fixed nonetheless. Using one Safety plan as an example, we estimate this could increase actuarial accrued liability and the present value of benefits by 0.1%, and could increase cost by about 0.05% of payroll for this group. The impact for each plan will depend on the number of deferred DROs represented in the plan demographics.

### **Maximum Historical Compensation**

Member benefits are computed based on highest average pay over some period of years. In times of low or negative pay increases, and for members with unique salary histories, the highest average pay may have occurred some years in the past, and current pay may be below the highest past average used to compute benefits. In these situations, liabilities based on most recent pay may understate true plan liabilities.

The CalPERS actuarial office provided a data field called “Maximum Historical Comp Amt.” In many cases this amount was greater than the average pay being used to calculate plan liabilities. The CalPERS actuarial office confirmed that

*The current core (or Actuarial Valuation System (AVS)) does not use the Max Historical Comp Amt. The Max Comp is currently being stored for the ability to be used in future enhancements to AVS.*

We estimate that incorporating this amount as a minimum bound for compensation when calculating plan liabilities would have a minor impact. In the case of one sample plan, liabilities could increase by 0.1%, and employer cost could increase by about 0.04% of payroll.

### **Computation of Normal Cost**

The CalPERS actuarial office provided test cases in which the entry age calculated using the Normal Cost Start Date was different than that using the benefit service. Actuarial calculations were performed using the entry age calculated based on the Normal Cost Start Date.

If the normal cost start date reflects periods in which eligibility or vesting service accrued, but not benefit service, the CalPERS actuarial office may want to reconsider using this date in entry age calculations for accounting purposes. GASB 67 states that:

*The beginning of the attribution period should be the first period in which the member’s service accrues pensions under the benefit terms, notwithstanding vesting or other similar terms.*

As such, we believe that the CalPERS actuarial office should consider modifying their entry age calculations to be based on the accumulated benefit service, instead of using the Normal Cost Start Date, if the CalPERS actuarial office desires to avoid using different liability measures for funding versus accounting.

## Other Comments

During our most recent audit of risk pools, we made a recommendation pertaining to Class 1 surcharges. We continue to recommend the following steps for future valuations.

- There are two benefit types, Cost of Living Adjustments (COLA) and Post Retirement Survivor Allowances (PRSA), which have been “grouped” for the purpose of pooled plan surcharges. The same surcharge is applied for 3%, 4%, or 5% COLAs. This is appropriate for the actuarial valuation since 3% is assumed to be the maximum (COLA cannot exceed inflation); however, in reality a 4% or 5% COLA is a more valuable benefit than a 3% COLA. Use of a stochastic model for future inflation may be useful to determine an adjustment to these surcharges.
- Likewise, the PRSA surcharge is the same for both the 25% and the 50% survivor benefit allowance. Our understanding is that this is a practical decision made to simplify the administration of the plan.

The consequence of the administration of the PRSA and COLA surcharges discussed above is to spread the additional costs of these benefits throughout the pool. Since the purpose of the surcharges is to adjust the costs for agencies with significantly different benefits, we recommend considering a revision in the methods employed to determine and apply the surcharges.

### Appendix 1: Active Demographic Data Comparison

Selected Plan	Plan	Formula	Average Age		Average Service <sup>1</sup>		Average Pay	
			6/30/2011 Data	AVS 6/30/2011	6/30/2011 Data	AVS 6/30/2011	6/30/2011 Data	AVS 6/30/2011
Coachella Valley Water District	Miscellaneous	2.0% @ 55, 2.5% @ 55	43	43	11.8	11.8	70,342	70,342
Colton, City of	Miscellaneous	2.7% @ 55	41	41	9.1	9.7	54,970	54,970
El Dorado Irrigation District	Miscellaneous	2.0% @ 55, 2.7% @ 55	47	47	9.6	9.6	72,624	72,624
Gilroy, City of	Safety	3.0% @ 50, 3.0% @ 55	40	40	10.0	10.1	110,275	110,275
Irvine, City of	Miscellaneous	2.7% @ 55	44	44	9.0	9.2	65,535	65,535
Long Beach, City of	Miscellaneous	2% @ 55, 2.5% @ 55 2.7% @ 55	46	46	11.5	11.7	64,349	64,352
Long Beach, City of	Safety	3% @ 50	41	41	13.9	14.2	104,487	104,487
Los Angeles County Office of Education	Miscellaneous	2.5% @ 55	47	47	10.7	11.6	48,729	48,729
Monterey, County of	Miscellaneous	2.0% @ 55	45	45	10.0	10.5	66,294	66,295
North County Transit District	Miscellaneous	2.0% @ 55	50	50	10.5	10.4	56,923	56,923
Oakland, City of	Miscellaneous	2.7% @ 55	48	48	11.5	11.9	75,009	75,009
Rialto, City of	Safety	3.0% @ 50	41	41	12.0	12.2	93,494	93,494

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<sup>1</sup> Average service in Cheiron EFI data is based on benefit service, while the average service in CalPERS data is calculated from the Normal Cost Start Date.

Parallel Valuation and Certification of the Actuarial Valuations of CalPERS Contracting Public Agency Plans as of June 30, 2011

Selected Plan	Plan	Formula	Average Age		Average Service <sup>1</sup>		Average Pay	
			6/30/2011 Data	AVS 6/30/2011	6/30/2011 Data	AVS 6/30/2011	6/30/2011 Data	AVS 6/30/2011
Riverside, County of	Miscellaneous	3% @ 60	43	43	8.7	8.9	53,294	53,294
Riverside, County of	Safety	3% @ 50	39	39	9.4	9.5	79,065	79,065
Sacramento, City of	Miscellaneous	2.0% @ 55	45	45	11.0	11.5	61,387	61,387
San Francisco BART	Miscellaneous	2% @ 55	51	51	14.1	14.5	76,278	76,278
Santa Ana, City of	Safety	3.0% @ 50	43	43	15.8	15.7	112,513	112,513
Santa Clara, County of	Miscellaneous	2.5% @ 55	47	47	11.7	12.2	86,541	86,541
Santa Clara County Central Fire Protection District	Safety	3.0% @ 50	43	43	12.5	14.9	135,259	135,259
Santa Clara County Housing Authority	Miscellaneous	2.0% @ 55	45	45	9.5	10.1	67,861	67,861
Solano, County of	Miscellaneous	2.7% @ 55	47	47	10.1	10.4	70,663	70,663
Yolo, County of	Safety	3.0% @ 50, 3.0% @ 55	39	39	9.0	9.1	69,303	69,303
Yorba Linda, City of	Miscellaneous	2.0% @ 55	44	44	8.2	8.7	68,973	68,973
Pool 2	Miscellaneous	2% @ 55	46	46	8.5	8.8	62,041	62,041
Pool 7	Safety	2% @ 50	39	39	8.7	8.8	67,011	67,011

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**Appendix 2a: Individual Plan Liability and Cost Comparison – Largest Plans**

Selected Plan	Plan	Formula	Present Value of Benefits		Actuarial Accrued Liability		Total Normal Cost (Employer + Employee)		Employer Cost as a % of Payroll	
			Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011
Los Angeles County Office of Education	Miscellaneous	2.5% @ 55	845,022,707	853,013,404	703,363,199	709,224,263	21,688,761	22,127,982	13.302%	13.957%
				99.1%	99.2%	98.0%	95.3%			
Long Beach, City of	Miscellaneous	2.5% @ 55 2.7% @ 55	2,272,064,109	2,261,592,936	1,979,574,874	1,971,681,766	42,285,744	42,213,316	15.572%	15.324%
				100.5%	100.4%	100.2%	101.6%			
Long Beach, City of	Safety	3% @ 50	2,221,691,248	2,174,052,140	1,916,998,115	1,868,031,443	40,663,309	40,020,659	38.332%	30.828%
				102.2%	102.6%	101.6%	124.3%			
Monterey, County of	Miscellaneous	2.0% @ 55	1,472,345,654	1,462,823,182	1,179,632,159	1,169,818,464	40,959,343	41,223,156	11.026%	10.926%
				100.7%	100.8%	99.4%	100.9%			
Oakland, City of	Miscellaneous	2.7% @ 55	2,270,554,067	2,286,784,755	2,007,978,472	2,025,140,791	40,114,570	40,558,088	26.405%	27.295%
				99.3%	99.2%	98.9%	96.7%			
Riverside, County of	Miscellaneous	3% @ 60	5,728,641,965	5,706,172,110	4,472,175,835	4,461,553,672	168,752,193	167,320,797	15.230%	15.001%
				100.4%	100.2%	100.9%	101.5%			
Riverside, County of	Safety	3% @ 50	2,717,277,081	2,690,634,139	2,070,018,579	2,032,001,280	80,300,675	79,114,388	24.545%	23.368%
				101.0%	101.9%	101.5%	105.0%			
San Francisco BART	Miscellaneous	2% @ 55	1,875,645,801	1,879,254,981	1,656,399,499	1,661,565,547	35,133,685	35,477,685	11.949%	12.269%
				99.8%	99.7%	99.0%	97.4%			
Santa Clara County	Miscellaneous	2.5% @ 55	8,407,690,842	8,392,593,076	6,966,984,597	6,930,682,371	210,419,792	215,163,111	15.833%	16.052%
				100.2%	100.5%	97.8%	98.6%			
Solano, County of	Miscellaneous	2.7% @ 55	1,316,870,480	1,314,495,709	1,102,414,697	1,100,723,215	31,113,921	31,470,519	16.576%	16.720%



Parallel Valuation and Certification of the Actuarial Valuations of CalPERS Contracting Public Agency Plans as of June 30, 2011

100.2%

100.2%

98.9%

99.1%



**Appendix 2b: Individual Plan Liability and Cost Comparison – Random Plans**

Selected Plan	Plan	Formula	Present Value of Benefits		Actuarial Accrued Liability		Total Normal Cost (Employer + Employee)		Employer Cost as a % of Payroll	
			Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011
Coachella Valley Water District	Miscellaneous	2.5% @ 55	311,233,973	312,562,828	270,168,733	271,745,467	5,443,063	5,437,746	20.698%	21.018%
				99.6%		99.4%		100.1%		98.5%
Colton, City of	Miscellaneous	2.7% @ 55	119,188,808	118,898,709	103,455,247	103,114,649	2,109,513	2,130,285	14.504%	14.484%
				100.2%		100.3%		99.0%		100.1%
El Dorado Irrigation District	Miscellaneous	2.0% @ 55, 2.7% @ 55	132,788,587	132,591,587	110,331,903	110,172,862	3,191,888	3,224,778	24.832%	24.950%
				100.1%		100.1%		99.0%		99.5%
Gilroy, City of	Safety	3.0% @ 50, 3.0% @ 55	136,522,932	135,353,474	109,084,832	107,654,773	3,462,485	3,485,899	31.450%	30.790%
				100.9%		101.3%		99.3%		102.1%
Irvine, City of	Miscellaneous	2.7% @ 55	303,199,567	305,205,799	243,353,110	245,667,207	8,748,701	8,800,174	23.533%	24.138%
				99.3%		99.1%		99.4%		97.5%
North County Transit District	Miscellaneous	2.0% @ 55	132,026,484	131,760,826	121,340,731	121,006,443	1,576,298	1,591,962	12.043%	11.988%
				100.2%		100.3%		99.0%		100.5%
Rialto, City of	Safety	3.0% @ 50	233,390,151	230,099,034	195,327,295	192,110,279	4,973,883	4,934,866	43.929%	42.168%
				101.4%		101.7%		100.8%		104.2%
Sacramento, City of	Miscellaneous	2.0% @ 55	1,006,441,380	1,007,411,141	815,727,913	819,168,698	26,187,750	26,079,093	13.579%	13.645%
				99.9%		99.6%		100.4%		99.5%

Parallel Valuation and Certification of the Actuarial Valuations of CalPERS Contracting Public Agency Plans as of June 30, 2011

Selected Plan	Plan	Formula	Present Value of Benefits		Actuarial Accrued Liability		Total Normal Cost (Employer + Employee)		Employer Cost as a % of Payroll	
			Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011
Santa Ana, City of	Safety	3.0% @ 50	995,981,836	986,047,407	869,524,076	859,019,269	18,108,669	18,364,114	30.002%	29.406%
				101.0%		101.2%		98.6%		102.0%
Santa Clara County Central Fire Protection District	Safety	3.0% @ 50	492,170,378	483,770,652	420,640,625	412,761,049	9,400,914	9,305,774	34.435%	32.743%
				101.7%		101.9%		101.0%		105.2%
Santa Clara County Housing Authority	Miscellaneous	2.0% @ 55	51,768,895	52,460,432	38,147,642	38,572,922	1,812,294	1,757,099	8.406%	8.701%
				98.7%		98.9%		103.1%		96.6%
Yolo, County of	Safety	3.0% @ 50, 3.0% @ 55	184,093,554	182,544,586	137,948,642	136,171,633	5,552,559	5,472,747	27.380%	26.475%
				100.8%		101.3%		101.5%		103.4%
Yorba Linda, City of	Miscellaneous	2.0% @ 55	60,359,979	60,475,329	50,478,476	50,663,748	1,309,543	1,310,964	17.084%	17.263%
				99.8%		99.6%		99.9%		99.0%

**Appendix 3: Risk Pool Liability and Cost Comparison**

Selected Pool	Plan	Formula	<u>Present Value of Benefits</u>		<u>Actuarial Accrued Liability</u>		<u>Total Normal Cost (Employer + Employee)</u>		<u>Employer Cost as a % of Payroll</u>	
			Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	Cheiron AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011	Cheiron 6/30/2011	AVS 6/30/2011
Risk Pool 2	Miscellaneous	2% @ 55	4,505,736,989	4,531,905,824	3,595,914,292	3,619,835,876	127,231,287	129,104,598	10.507%	10.921%
				99.4%		99.3%		98.5%		96.2%
Risk Pool 7	Safety	2% @ 50	659,497,680	656,225,272	509,176,873	503,491,275	16,990,927	16,809,969	24.359%	23.513%
				100.5%		101.1%		101.1%		103.6%