

**SUBMITTAL TO THE BOARD OF SUPERVISORS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA
FORM 11: Pension Advisory Review Committee (PARC) 2016 Annual Pension Report**

[Districts: All] [\$0]

DATE: April 27, 2016

PAGE: 2 of 3

BACKGROUND:

Summary (continued)

Introduction:

PARC was established in 2003 to guide policy decisions about retirement benefits. Since its inception, PARC has recommended refinancing the CalPERS' liability using Pension Obligation Bonds thus realizing a net savings of \$72 million. It recommended several steps that reduced the County's OPEB liability from over \$237 million to \$47 million by the establishment and funding of an OPEB Trust to fund post-employment health benefits and the creation of a separate rate pool for early retirees that has removed the implied subsidy obligation of the County.

REPORT SUMMARY

Pension Reform:

The Board of Supervisors took the initiative on pension reform. As a result of labor negotiations, employees took on the responsibility of making the Employee Paid Member Contributions (EPMC). Based on projections made by our PARC Advisor, Bartel Associates, in FY 15/16, it is anticipated that the County will realize \$93.4 million annual savings as shown on page 6 of the attached report.

Due to the passage of Assembly Bill (AB) 340, which created the Public Employees' Pension Reform Act (PEPRA), a third tier was added to the County's pension plan. The attached report has additional detail outlining the changes; however, listed below is a table of the changes.

				Plan	EPMC	Earliest Retirement Age	PEPRA Compensation Limits	Final Benefit	Effective Date
County Plan Tier I									
	Misc			3% at 60	No	50	N/A	12 months	N/A
	Safety			3% at 50	No	50	N/A	12 months	N/A
County Plan Tier II									
	Misc			2% at 60	No	50	N/A	36 months	8/23/2012
	Safety			2% at 50	No	50	N/A	36 months	8/23/2012
County Plan III (PEPRA)									
	Misc			2% at 62	No	52	\$117,020*	36 months	1/1/2013
	Safety			2.7% at 57	No	50	\$140,424*	36 months	1/1/2013

*2015 Compensation Limits are Indexed Annually

Funded Status:

The June 30, 2016 projected actuarial funded status, based on the market valuation for the Miscellaneous Plan, including Pension Obligation Bonds (POBs) proceeds is expected to be 73.3%. The projected actuarial funded status based on the market valuation for the Safety Plan including POBs, is 72.0%. The overall funding ratio of both plans is 72.9%. The PARC Advisor, Bartel Associates, projects a combined Miscellaneous and Safety Accrued Value of Assets of \$6.89 billion on a Market Value Basis, and, a POB balance of \$304.5 million. The County has a projected Unfunded Accrued Actuarial Liability of \$1.492 billion.

Employer Rate Outlook:

Over the last few years, CalPERS made several changes that increased contribution rates beginning July 1, 2015. Some of the primary changes in rates are mortality improvement, fixed amortization periods, elimination of caps on rate increases and no asset smoothing. The increases became effective with the FY 15/16 rate and the rates are projected to increase through FY 23/24 and then plateau for 7-10 years. The full impact is

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expected to take effect in FY 23/24 and rates will remain at that peak through FY 30/31. Bartel and Associates have prepared charts on Pages 8 and 9 of the attached report that show the expected impact.

Due to the change in assumptions listed above, the County's rates will be higher for FY 16/17 and continue to be higher for the next 10-15 years. In FY 16/17, the County rate is expected to increase by 1.1% for Miscellaneous and 3.0% for Safety.

Liability Management Fund:

The purpose of the fund is to reduce pension costs and accelerate the repayment of pension liabilities. By Board policy, each year PARC recommends whether the funds should be used to pay down the CalPERS' unfunded liability or the buy down of the POB. This year PARC is recommending the establishment of a Section 115 Pension Trust. Unlike assets in CalPERS, the County can directly control the investments in the Trust. Assets in the trust can be used to reimburse the County for CalPERS' contributions and for making direct payments to CalPERS. In lieu of remitting these funds to CalPERS, PARC is recommending using the funds in the Liability Management fund to start the Trust.

Section 115 Pension Trust:

A Section 115 Pension Trust will assist the County to mitigate the CalPERS' contribution rate volatility. Assets from the Trust can only be used for pension obligations. In the past, the County has forwarded the funds from the Liability Management fund to either CalPERS to cover our unfunded liability or forwarded them to the bondholders to reduce our Pension Obligation Bonds. By placing funds from the Liability Management fund into the Section 115 Pension Trust, the County can use the Trust to reduce the volatility of CalPERS. The Trust will be an asset on the balance sheet, and the Trust can be designed for long-term earnings with higher expected rates of return than the County Investment Fund.

Annual Prepayment:

CalPERS offers early payment discounts of 3.75% in lieu of periodic payments that coincide with payroll disbursements. PARC first recommended seizing this opportunity in 2004 and expects to continue to do so if market conditions for our annual cash flow borrowing prove to be favorable in funding the pre-payment. The amount to be prepaid is a portion of up to two-thirds of the County's annual liability. During FY 14/15, the County prepaid \$86.6 million of its PERS' liability. In FY 16/17, we expect to prepay CalPERS up to two-thirds of the liability (approximately \$164.8 million). We will calculate the final amount as part of our Tax Revenue Anticipation Notes (TRANS) financing. If market conditions remain consistent through the TRANS financing process, the County should be able to issue the notes at approximately 0.8%. Coupled with the pre-payment savings from CalPERS of approximately 3.75%, the County should realize a net savings of 2.95% or approximately \$4 million.

Other Post-Employment Benefits (OPEB):

The County invests its OPEB assets with the California Public Employers' Retirement Benefit Trust program (CERBT). Effective January 1, 2011, CalPERS introduced three new investment allocation strategies for CERBT. PARC reviewed the details of the strategies and adopted Strategy 1, an asset allocation strategy most similar to the investment allocation strategy followed by CERBT prior to January 1, 2011, with an expected rate of return of 7.61%. CERBT recently lowered its investment strategy to 7.28%, and is 83.6% funded.

Impact on Citizens and Businesses:

An increase in pension costs, in turn increases the costs of services that are provided to the citizens of the County. PARC recommendations have driven down the cost of pensions while maximizing the resources. Departments continue to look for efficiencies to minimize the effect on the citizens.

2016

Pension Advisory Review Committee



2016 Annual Pension Report

Introduction:

The County's Pension Advisory Review Committee (PARC) was established in 2003 to guide policy decisions about retirement benefits. PARC is a Brown Act Committee and presently consists of members appointed by the Board of Supervisors, including the Treasurer/Tax Collector, County Finance Director, and the Human Resources Director (Board Policy B-25).

A key responsibility of PARC is to report to the Board and the public on important developments affecting County retirement benefit plans, analyze any proposed changes to the benefit system, and provide information about projected costs and funding status. This report includes information from the most recent actuarial report prepared for the County by John Bartel of Bartel Associates, LLC. (Attachment 1). It also includes the latest CalPERS' Valuation Reports for Miscellaneous and Safety (Attachments 2 and 3). The annual report focuses on the County Primary plans and does not address the smaller plans of the Flood Control and Park districts.

Summary:

For the fiscal year 2014-15 CalPERS earned 2.4%. In part due to less than expected performance, the CalPERS' Board approved a number of actuarial changes, which will have the effect of increasing the County's rates over the near term. The cumulative effect of these changes pushes out a projected long-term decline in rates, highlighted in last year's report from 2021 to 2031. Separately, steps taken to achieve pension reform are showing results with total annual savings now close to \$100 million annually. Finally, the pension obligation bond issued in 2005 to partially fund the County's unpaid liability shows \$72 million in net savings.

CalPERS Changes:

Over the last year, CalPERS' actuarial staff implemented a number of changes which will have the effect of increasing rates in the near term. They included:

Asset Smoothing – Asset Smoothing will be eliminated over a five year period. These changes were included in CalPERS' 06/30/13 valuation, with the first impact in the FY 15/16 rates with full impact in FY 19/20.

Demographic Assumption – CalPERS also approved demographic actuarial assumption changes. The most significant change is the anticipation of future mortality improvement. This was included in the 06/30/14 valuation with the first impact in FY 16/17 and full impact in FY 20/21.

Risk Mitigation – In November 2015 CalPERS adopted a new Risk Mitigation Strategy. The changes are as follows:

- Moving to more conservative investments over time.
- Adopting an assumed interest rate that reflects the change in the investment policy.
- The investment (Discount) rate is likely to reach a 6.5% level from the current rate of 7.5% in 20 years.

Another adjustment CalPERS initiated was Risk Pool Changes. The changes are as follows:

- All Risk Pools combined into two Risk Pools, one for Miscellaneous and one for Safety. In prior years, the Risk Pools were segregated by retirement formulas; however, now we have one for Miscellaneous and one for Safety. Collect payment on Unfunded Actuarial Liability (UAL) as a dollar amount and not as a percent (%) of pay.
- Payments allocated to agencies based on their portion of the Risk Pool's liability and assets rather than payroll.

The Risk Pool changes were included in CalPERS' 06/30/13 valuation impacting FY 15/16 rates (note: this change was not phased in over five years). The Risk Pool changes do not affect the County's Miscellaneous or Safety Plans but do affect some of the County special districts.

Funding Status:

The June 30, 2016 projected actuarial funded status based on the market valuation for:

- The Miscellaneous Plan, including Pension Obligation Bonds (POB) proceeds but not amounts owed on the POB, is expected to be **76.9%**.
- The Safety Plan, including POB proceeds but not amounts owed on the POB, is expected to be **74.2%**.

The July 2008 State and Local Government Pension Plans report published by the United States Government Accountability Office states, "Many experts consider a funded ratio based on the actuarial asset value of 80% or better to be sound for government pensions." Bartel also states that a pension plan should be considered a very long-term proposition that should not be viewed in the context of short-term bright line tests.

Employer Rate Outlook:

The employer contribution rates for the **Miscellaneous Plan** will increase from 15.4% of payroll in FY 15/16 to 16.5% in FY 16/17. The reasons for the change are as follows:

	<u>FY 16-17</u>
• 2015/16 Employer Rate	15.4%
• Asset Method Change	0.7%
• Assumption Change	0.7%
• (Gains)/Losses	<u>(0.3%)</u>
Total	16.5%

Safety Employer Contribution rates will increase from 23.6% in FY 15/16 to 26.6% in FY 16/17. The reasons for the change are as follows:

	<u>FY 16-17</u>
• 2015/16 Employer Rate	23.6%
• Asset Method Change	1.5%
• Assumption Change	1.1%
• (Gain)/Losses	<u>0.4%</u>
Total	26.6%

The higher rates are projected for the next 5 - 6 years as future rates are expected to rise due to the changes outlined above.

As described earlier, CalPERS has made several changes that will increase contribution rates beginning July 1, 2015. Listed below are tables with the projected changes for Miscellaneous and Safety. These projections are based on data from the Bartel Associates Report and the rates include POB debt service.

Miscellaneous Plan Projected Rates and Payments (\$ Thousands)				
FY	CalPERS Base	County Rate	County Payment	Change in Amount
2015/16	936,023	18.10%	169,420	NA
2016/17	980,729	19.60%	192,223	22,803
2017/18	1,010,151	20.50%	207,081	14,858
2018/19	1,040,455	21.80%	226,819	19,738
2019/20	1,071,669	22.80%	244,341	17,521
2020/21	1,103,819	23.00%	253,878	9,538
2021/22	1,136,934	23.50%	267,179	13,301
2022/23	1,171,042	23.70%	277,537	10,357

(See Graph on Page 8 - Includes Pension Obligation Bonds Debt Service, which averages 2.75 %)

Safety Plan Projected Rates and Payments (\$ Thousands)				
FY	CalPERS Base	County Rate	County Payment	Change in Amount
2015/16	296,524	25.90%	76,800	NA
2016/17	322,541	29.20%	94,182	17,382
2017/18	332,217	31.20%	103,652	9,470
2018/19	342,184	33.60%	114,974	11,322
2019/20	352,449	35.50%	125,119	10,146
2020/21	363,023	36.00%	130,688	5,569
2021/22	373,913	36.70%	137,226	6,538
2022/23	385,131	36.90%	142,113	4,887

(See Graph on Page 9 - Includes Pension Obligation Bonds Debt Service, which averages 1.5 %)

Pension Reform:

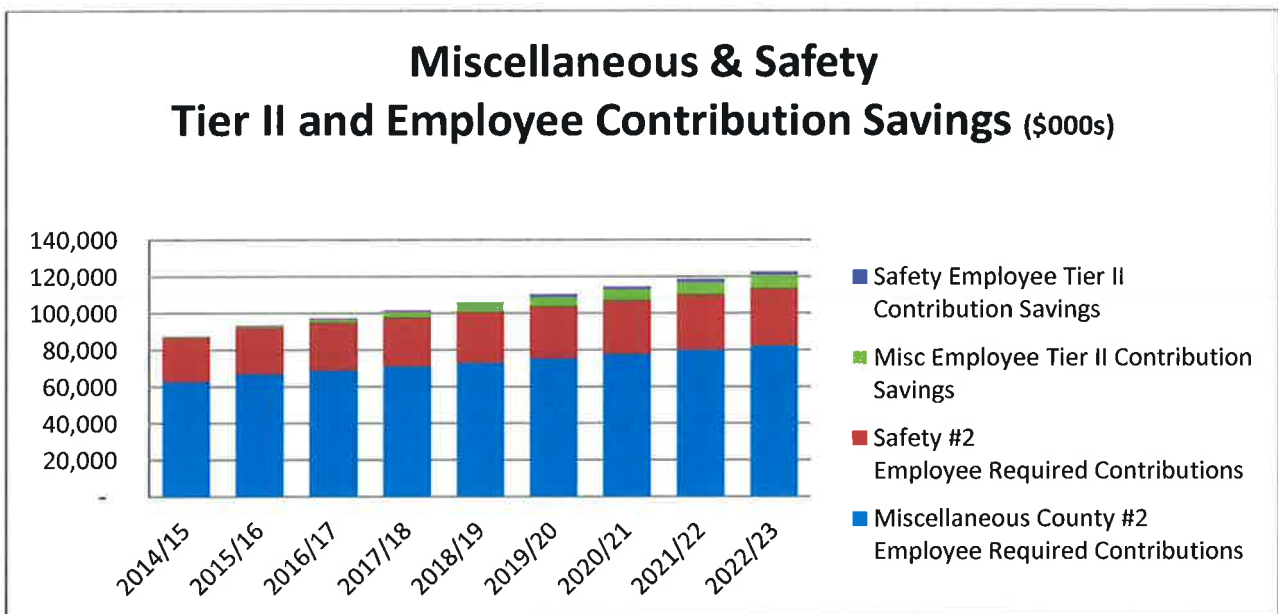
For some time, pension reform has been a topic of debate at local and national levels. Riverside County took the lead in initiating pension reform with its bargaining units. As a result of bargaining, employees of the County were required to pay their own member contribution, i.e. eliminating the Employer Paid Member Contribution (EPMC). Additionally, a new second retirement Tier (Tier II) was implemented with a lower benefit formula, which became effective on August 24, 2012. A new tier was added in both the Miscellaneous and Safety units of the County. Shortly thereafter, Governor Brown initiated proposals resulting in changes to pension benefits. The passage of Assembly Bill (AB) 340 created the Public Employees' Pension Reform Act (PEPRA) that implemented new lower benefit formulas, final compensation periods, and new contribution requirements for new employees hired on or after January 1, 2013 who meet the definition of a new member under PEPRA (known as Tier III). The lower benefit formula for Tier III is 2% at 62 for Miscellaneous and 2.7% at 57 for Safety. Employee contribution rates for Tier III vary based on PEPRA rules. Listed below is a table with the new options and the important changes.

Summary of Riverside County CalPERS Pension Tiers

		Plan	EPMC	Earliest Retirement Age	PEPRA Compensation Limits	Final Compensation	Effective Date
County Plan Tier I							
	Misc	3% at 60	No	50	N/A	12 months	N/A
	Safety	3% at 50	No	50	N/A	12 months	N/A
County Plan Tier II							
	Misc	2% at 60	No	50	N/A	36 months	8/24/2012
	Safety	2% at 50	No	50	N/A	36 months	8/24/2012
County Plan Tier III (PEPRA)							
	Misc	2% at 62	No	52	\$117,020*	36 months	1/1/2013
	Safety	2.7% at 57	No	50	\$140,424*	36 months	1/1/2013

*2016 Compensation Limits are Indexed Annually

The chart below reflects the annual savings the Board will realize as a result of implementing pension reform.



	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Total Savings	93,419	97,313	101,624	106,188	110,269	114,390	118,486	122,601

Source: Human Resources Department

CalPERS also made changes as a result of several fiscal years of losses. They include fixed amortization schedule, elimination of asset smoothing and adoption of risk mitigation. The table below lists the losses and recoveries since fiscal year 2008.

CalPERS' Investment Earnings

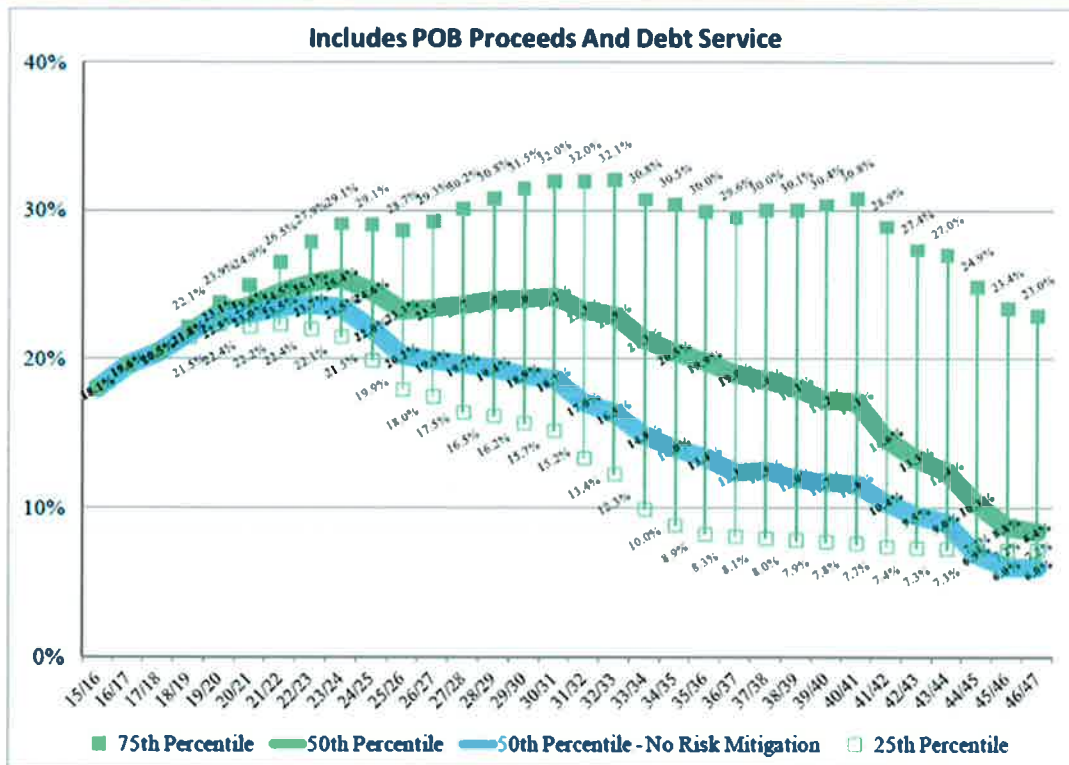
	Market Value of Assets	Net Accumulated (Arithmetic) Market Increase/(Decrease) Since 2008 ¹
▪ June 30, 2008 Return	(5.1%)	
• Gain/(Loss) ¹	(12.9%)	(12.9%)
▪ June 30, 2009 Return	(24.0)%	
• Gain/(Loss) ¹	(31.8)%	(44.7%)
▪ June 30, 2010 Return	13.3%	
• Gain/(Loss) ¹	5.5%	(39.2%)
▪ June 30, 2011 Return	21.7%	
• Gain/(Loss) ¹	13.9%	(25.3%)
▪ June 30, 2012 Return	0.1%	
• Gain/(Loss) ¹	(7.4)%	(32.7%)
▪ June 30, 2013 Return	13.2%	
• Gain/(Loss) ¹	5.7%	(27.0%)
▪ June 30, 2014 Return	18.4%	
• Gain/(Loss) ¹	10.9%	(16.1%)
▪ June 30, 2015 Return	<u>2.4%</u>	
• Gain/(Loss) ¹	(5.1%)	(21.2%)

¹ Relative to expected return. A return of 0% equates to 7.5% loss. **Actual losses of value are less.**

Listed below are two charts that show the projected rates for the County’s pension obligations. Over the next few years, rates are going to remain high as CalPERS’ assumption changes are absorbed. Once the smoothing is completed and assuming no other changes, the rates will start to decline.

CONTRIBUTION PROJECTIONS - MISCELLANEOUS Impact of Risk Mitigation Strategy

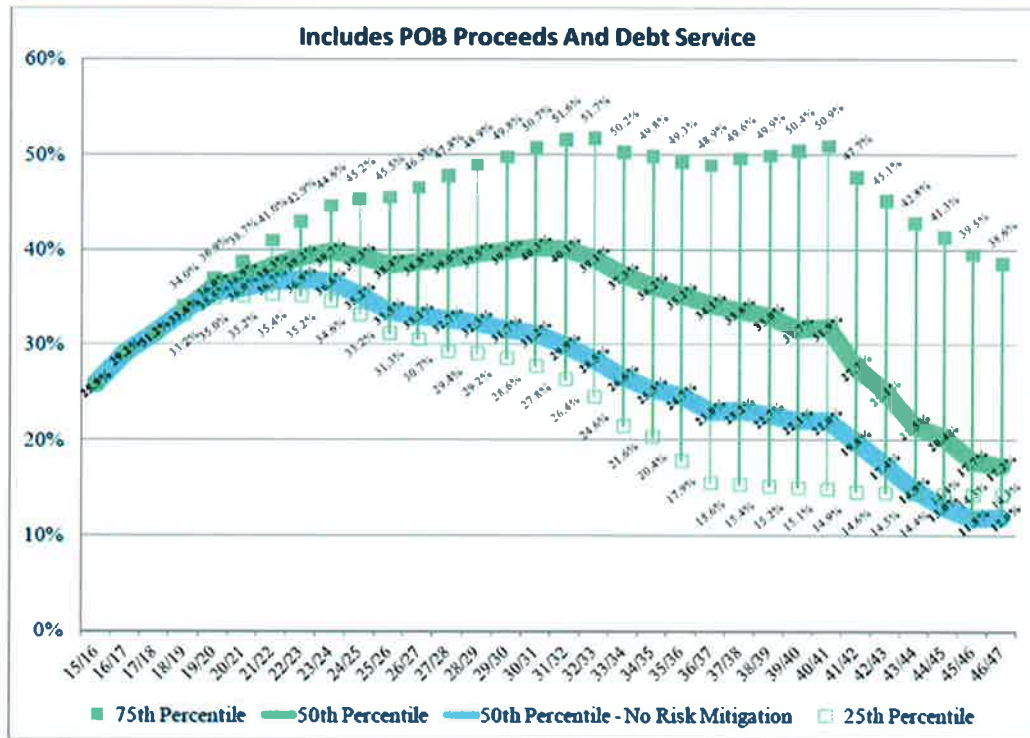
CONTRIBUTION PROJECTIONS - MISCELLANEOUS



Source: Bartel and Associates

CONTRIBUTION PROJECTIONS – SAFETY Impact of Risk Mitigation Strategy

CONTRIBUTION PROJECTIONS – SAFETY



Source: Bartel and Associates

Pension Obligation Bond (POB):

The County sold Pension Obligation Bonds (POBs) in 2005 locking a borrowing cost of 4.91%). The POBs amount outstanding total \$304.5 million and the bonds have a remaining 19-year life maturity. Bartel’s analysis shows that as of February 15, 2016, the County has a \$72 million net savings as a result of the sale of the bonds in February 2005. This is a \$4 million improvement compared to last year’s report. The POBs have a relatively low break-even rate of (4.91%) and CalPERS’ expected return is 7.50%. If CalPERS earns at a rate slightly below the bond rate for the term of the bonds, well below new target rate of 6.0%, the County can expect to produce savings over the remaining life of the bonds.

Liability Management Fund:

The Liability Management Fund was established under the POB documents. The purpose of the fund is to reduce pension costs and accelerate the repayment of pension liabilities by setting aside a portion of the cash flow savings, which occur annually independent of the lifecycle savings mentioned above. Per Board policy, each year PARC recommends whether the funds should be used to pay down the CalPERS’

unfunded liability or to buy down the POBs. To date the excess has been sent up to reduce the CalPERS' liability. This year the PARC has recommended exploring the use of a Section 115 Supplemental Pension Trust and depositing the funds from the Liability Management Fund into the Trust, which is permissible under the bond indenture.

Section 115 Supplemental Pension Trust:

A Section 115 Supplemental Pension Trust can help the County mitigate CalPERS' contribution rate volatility. In addition, assets in the Supplemental Pension Trust will be counted toward the pension assets under GASB 68 and reduce the County's pension unfunded liability. Assets in the Supplemental Pension Trust could not be used for other purposes except for reimbursing the County for CalPERS' contributions and for making payments directly to CalPERS. Furthermore, unlike assets in CalPERS, the County can directly control the investments in the Supplement Pension Trust. Funds would be managed by professional money managers, consistent with the County's risk profile in a combination of debt and equity investments.

PARC is recommending that the County form a Trust and use the funds in the Liability Management Fund to fund the Trust.

Annual Prepayment:

CalPERS offers early payment discounts of 3.75% in lieu of periodic payments that coincide with payroll disbursements. PARC first recommended seizing this opportunity in 2004 and expects to continue to do so if market conditions prove to be favorable in funding the pre-payment. The amount paid can be a portion of up to two-thirds of the County's annual liability. In FY 14/15, the County prepaid CalPERS \$86.5 million (Safety \$29.6 + Miscellaneous \$56.9 = \$86.5) million. The County will calculate the final amount due as part of the annual Tax Revenue Anticipation Notes (TRAN's) financing. The County is projecting to issue TRANs at approximately 0.8%. The pre-payment savings from CalPERS are at approximately 3.75%, which equates to at least \$3 million in savings.

Other Post-Employment Benefits (OPEB):

Other Post-Employment Benefits provided by the County are comprised primarily of a contribution to the cost of retiree medical care. The County established an OPEB Trust in 2007 to reduce the actual and nominal liability. The County invests its OPEB assets with the California Public Employers' Retirement Benefit Trust program (CERBT). Effective January 1, 2011, CalPERS introduced three new investment allocation strategies for CERBT. PARC reviewed the details of the strategies and adopted Strategy 1, an asset allocation strategy most similar to the investment allocation strategy followed by CERBT prior to January 1, 2011, with an expected rate of return of 7.61%. CERBT lowered its investment strategy expected return to 7.28%. As of June 30, 2015, the CERBT is funded at 83.6%. Since the OPEB Trust fund is well funded, the committee discussed the potential of the Trust reimbursing the County for the Annual Required Contribution and decided to have the ARC reimbursed from the Trust to the County.

This strategy will allow the County to keep the Trust well-funded and will allow those funds to be used to reduce the CalPERS' pension liability.

Recommendations:

1. Receive and file the 2016 PARC Annual Pension Report.
2. Adopt the recommendation to establish a Section 115 Pension Trust and to transfer the excess Liability Management funds to the Trust.
3. Adopt the recommendation to transfer excess OPEB Trust funds in the amount of \$2 million to the Section 115 Pension Trust.
4. Adopt the recommendation to pre-pay a portion up to two-thirds of the County's FY 2016/17 pension cost if, in the judgment of the County Executive Officer or his designee, market conditions prove to be favorable.

Appendices:

1. *Bartel Associates CalPERS' Actuarial Issues – 6/30/14 Valuation- February 1, 2016*
2. *CalPERS 06/30/14 Miscellaneous Actuarial Valuation Reports*
3. *CalPERS 06/30/14 Safety Actuarial Valuation Reports*
4. *County of Riverside Postretirement Benefits Plan Actuarial Valuation 07/01/2015*



B. JRTEL
ASSOCIATES, LLC

**COUNTY OF RIVERSIDE
MISCELLANEOUS AND SAFETY PLANS**

**CalPERS Actuarial Issues – 6/30/14 Valuation
Preliminary Results**

Presented by Doug Pryor, Vice President
Bianca Lin, Assistant Vice President
Prepared by Adam Zimmerman, Actuarial Analyst
Bartel Associates, LLC
February 1, 2016

Agenda

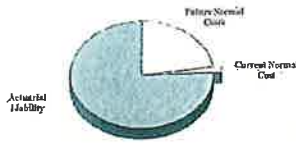
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DEFINITIONS

Present Value of Benefits
June 30, 2014

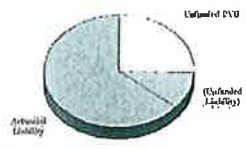


- **PVB - Present Value of all Projected Benefits:**
 - Discounted value (at valuation date - 6/30/14), of all future expected benefit payments based on various (actuarial) assumptions
- **Actuarial Liability:**
 - Discounted value (at valuation date) of benefits earned through valuation date [value of past service benefit]
 - Portion of PVB "earned" at measurement
- **Current Normal Cost:**
 - Portion of PVB allocated to (or "earned" during) current year
 - Value of employee and employer current service benefit

February 1, 2016 1

DEFINITIONS

Present Value of Benefits
June 30, 2014



- **Target-** Have money in the bank to cover Actuarial Liability (past service)
- **Unfunded Liability** - Money short of target at valuation date
- **Excess Assets / Surplus:**
 - Money over and above target at that point in time.
 - Doesn't mean you're done contributing.
- **Super Funded:**
 - Assets cover whole pie (PVB)
 - If everything goes exactly like PERS calculated, you'll never have to put another (employer or employee) dime in.

February 1, 2016 2

CALPERS CHANGES

- Contribution policy changes:
 - No asset smoothing
 - 5-year ramp up
 - Included in 6/30/13 valuation (first impact 15/16 rates; full impact 19/20)
- Assumption changes:
 - Anticipate future mortality improvement
 - Other, less significant, changes
 - Included in 6/30/14 valuation (first impact 16/17 rates; full impact 20/21)
- Risk Mitigation Strategy
 - Move to more conservative investments over time
 - Only when investment return is better than expected
 - Lower discount rate in concert
 - Essentially use ≈50% of investment gains to pay for cost increases
 - Likely get to 6.5% over ≈ 20 years



February 1, 2016



CALPERS CHANGES

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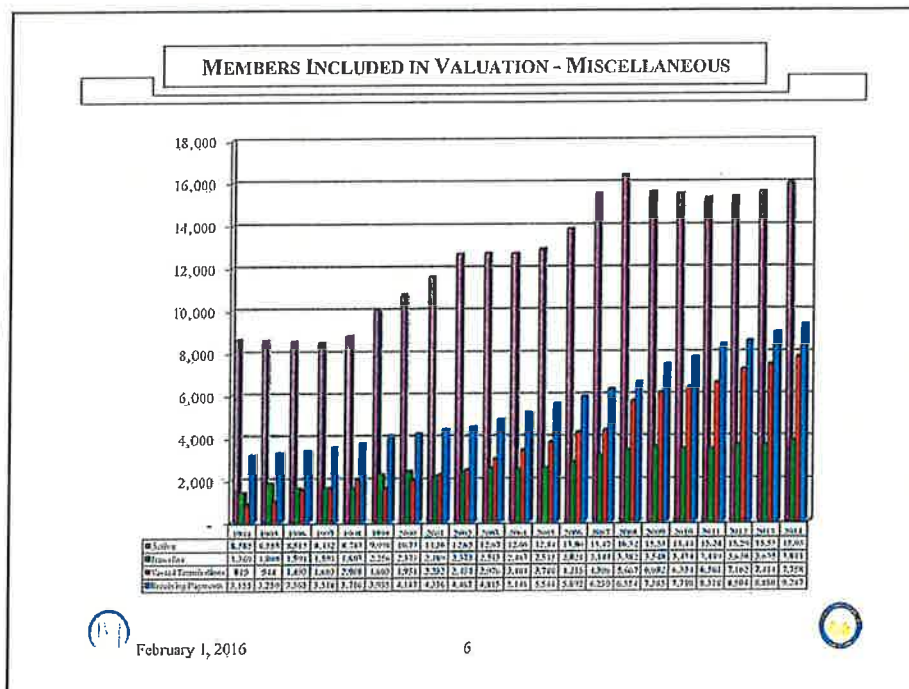
February 1, 2016

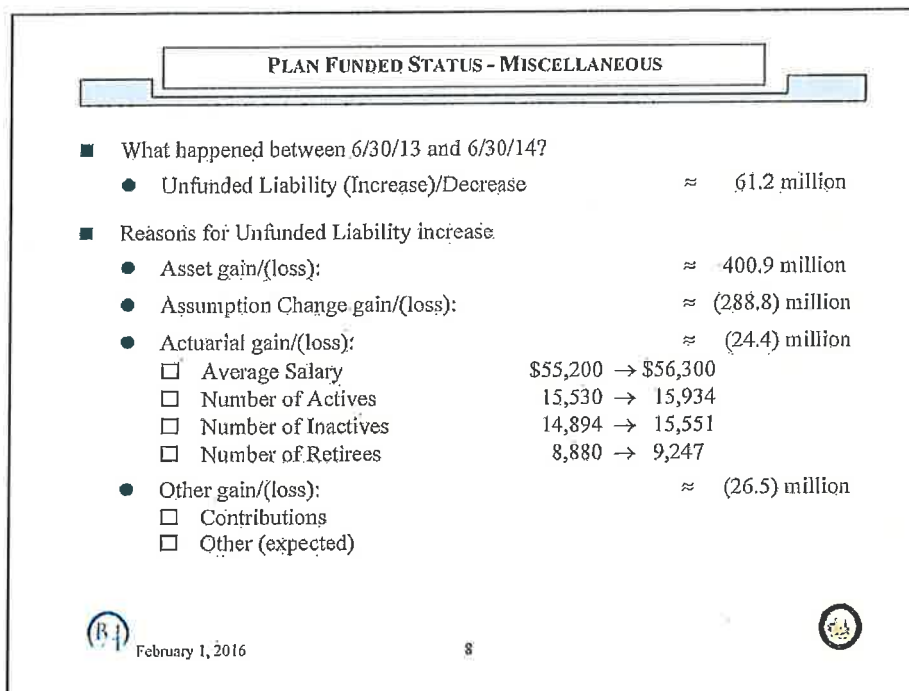
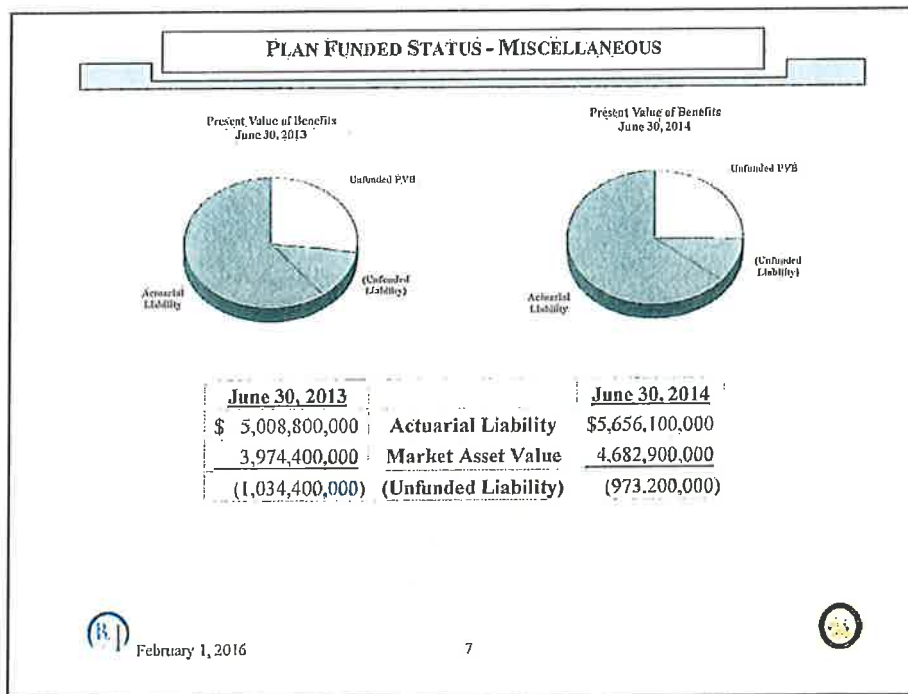


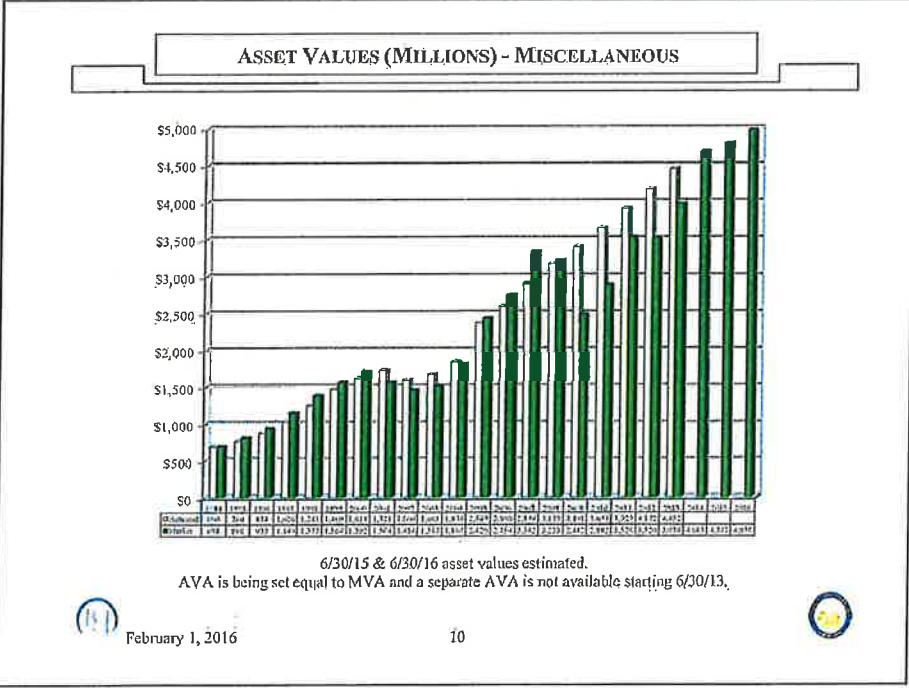
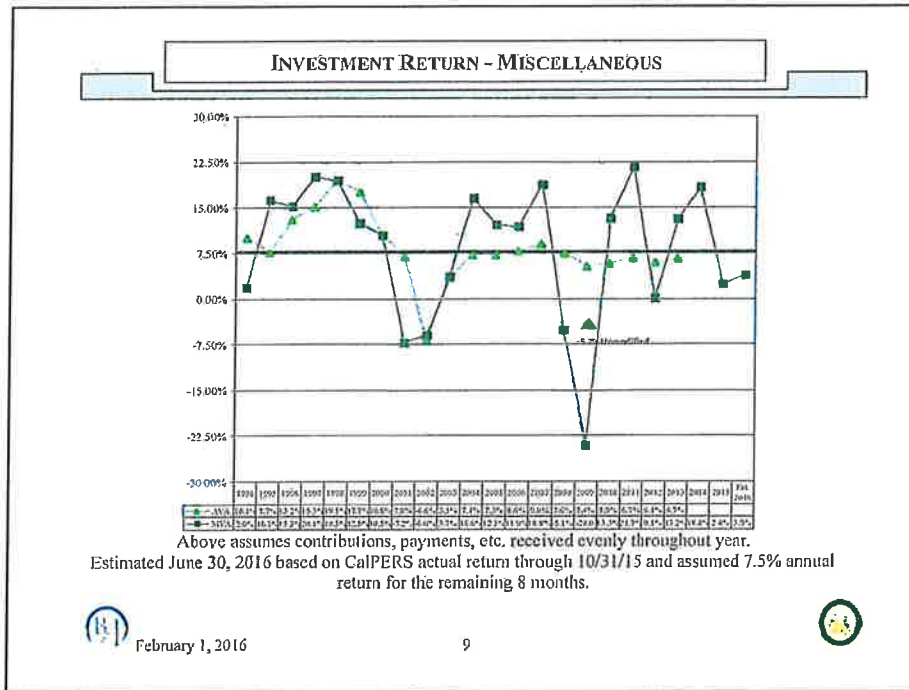
SUMMARY OF DEMOGRAPHIC INFORMATION - MISCELLANEOUS				
	1994	2004	2013	2014
Actives				
■ Counts	8,585	12,664	15,530	15,934
■ Average				
• Age	42	43	44	44
• County Service	8	8	10	10
• PERSable Wages	\$34,000	\$45,100	\$55,200	\$56,300
■ Total PERSable Wages (millions)	318.8	629.2	936.0	980.7
Receiving Payments				
■ Counts				
• Service		3,946	7,480	7,793
• Disability		574	578	587
• Beneficiaries		626	822	867
• Total	3,155	5,146	8,880	9,247
■ Average Annual County Provided Benefit ¹				
• Service		\$13,100	\$23,200	\$24,100
• Disability		6,800	8,900	8,900
• Service Retirements in last 5 years		18,100	27,600	25,700

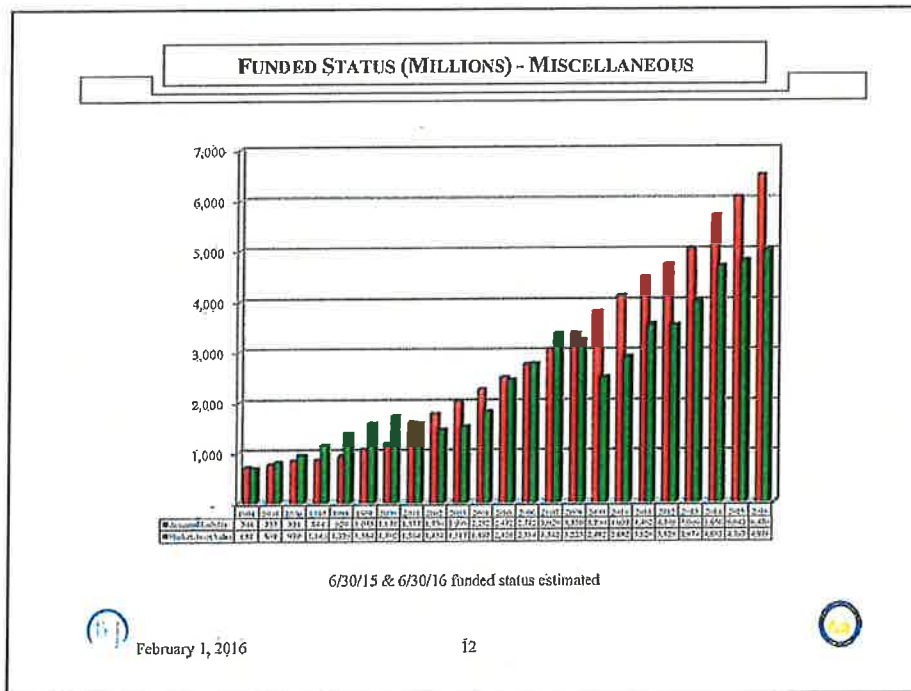
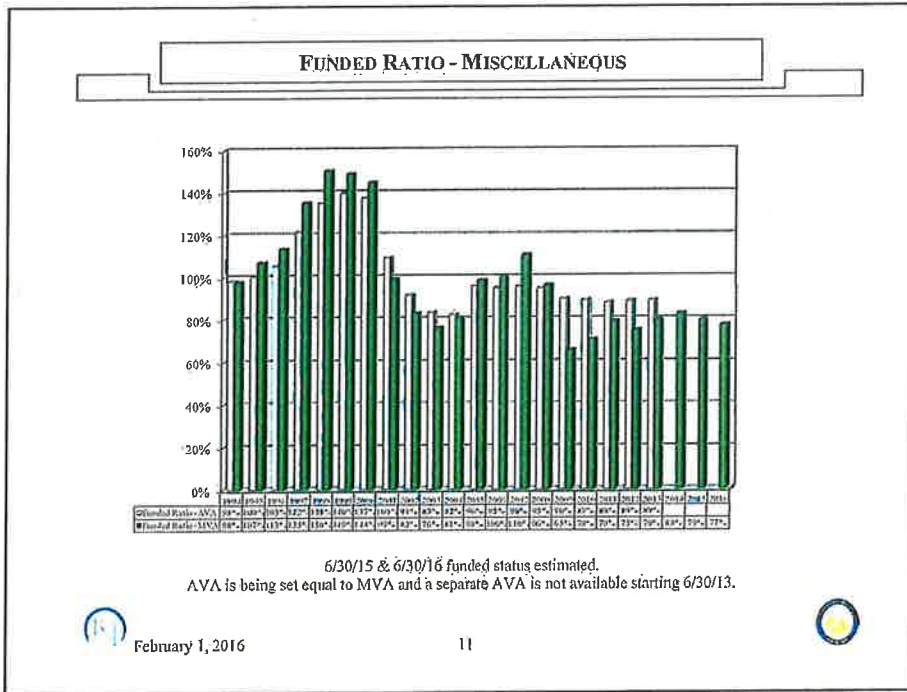
¹ Average County provided pensions are based on County service & County benefit formula, and are not representative of benefits for long service employees.

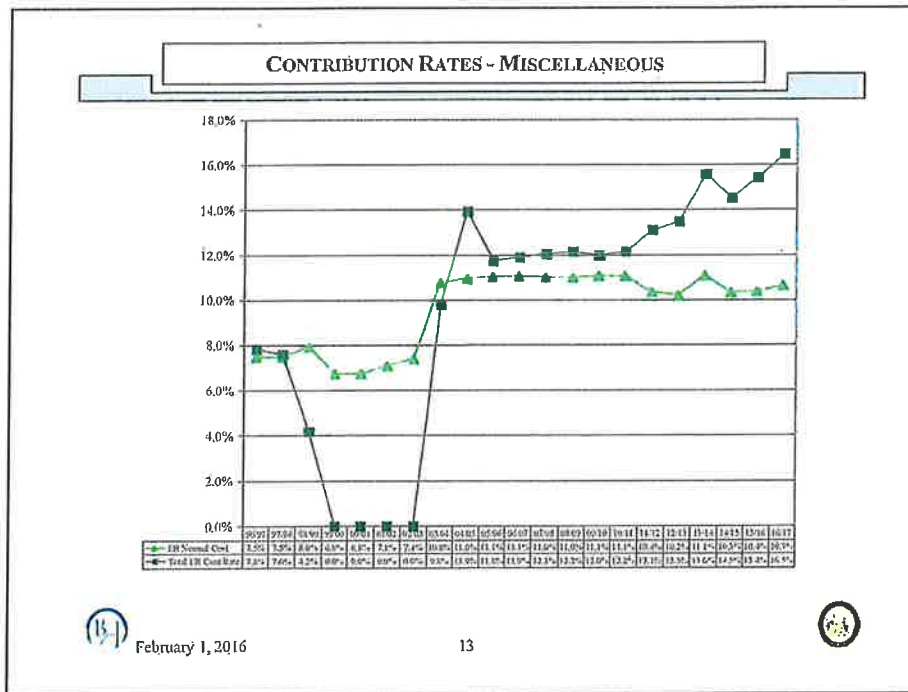
February 1, 2016 5











CONTRIBUTION RATES - MISCELLANEOUS

	6/30/13 <u>2015/2016</u>	6/30/14 <u>2016/2017</u>
■ Total Normal Cost	18.1%	18.3%
■ Employee Normal Cost	7.7%	7.6%
■ Employer Normal Cost	10.4%	10.7%
■ Amortization Bases	<u>5.1%</u>	<u>5.8%</u>
■ Total Employer Contribution Rate	15.4%	16.5%
■ Amortization Period	Multiple	Multiple
■ What Happened from 6/30/13 to 6/30/14:		
● 2015/16 Rate	15.4%	
● Asset Method Change (2 nd Year)	0.7%	
● Assumption Change (1 st Year)	0.7%	
● (Gains)/Losses	<u>(0.3%)</u>	
● 2016/17 Rate	16.5%	

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CONTRIBUTION PROJECTIONS - MISCELLANEOUS

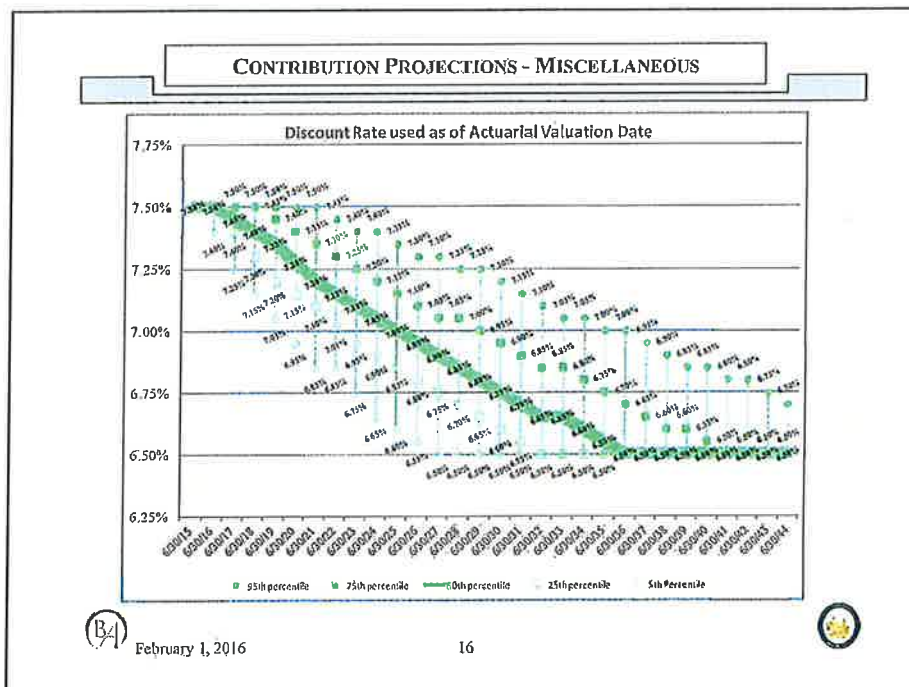
- Market Value Investment Return:
 - June 30, 2013 13.2%²
 - June 30, 2014 18.4%²
 - June 30, 2015 2.4%²
 - Future returns³ based on stochastic analysis using 1,000 trials

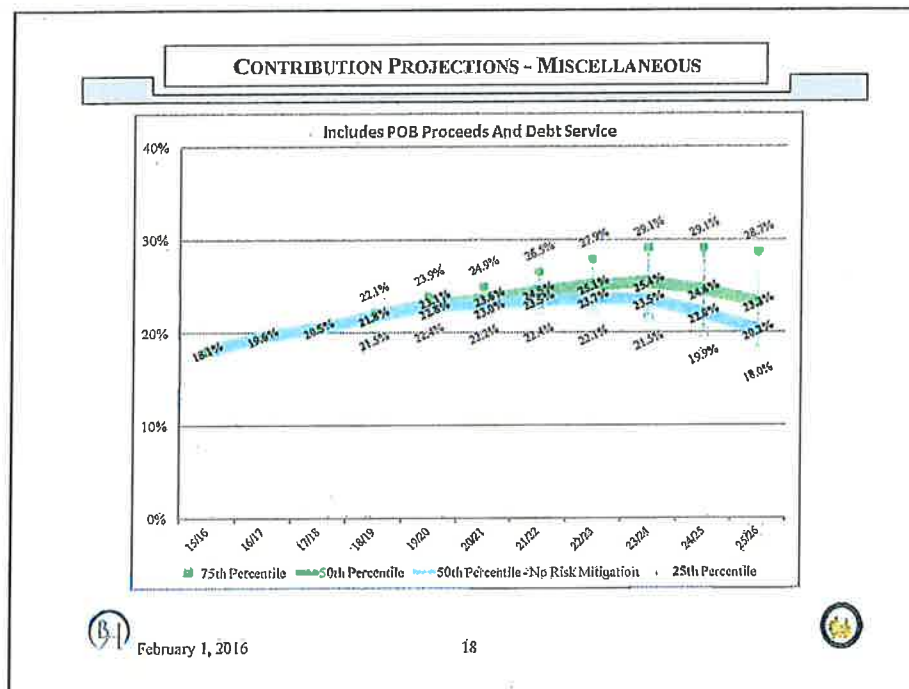
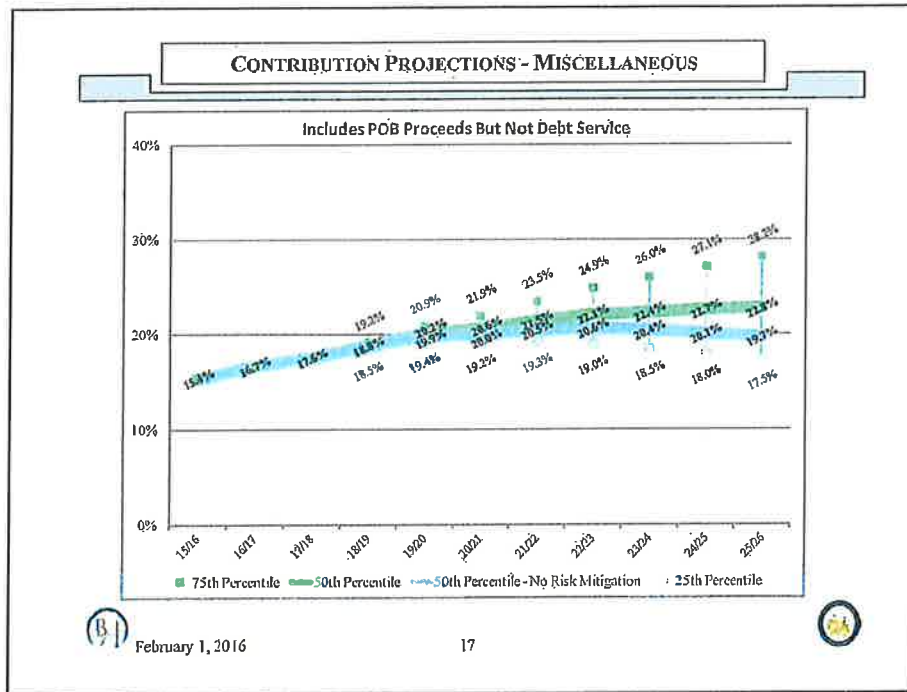
Single Year Returns at	25 th Percentile	50 th Percentile	75 th Percentile
● 7.5% Investment Mix	0.6%	7.5%	15.3%
● 6.5% Investment Mix	1.3%	6.5%	11.9%

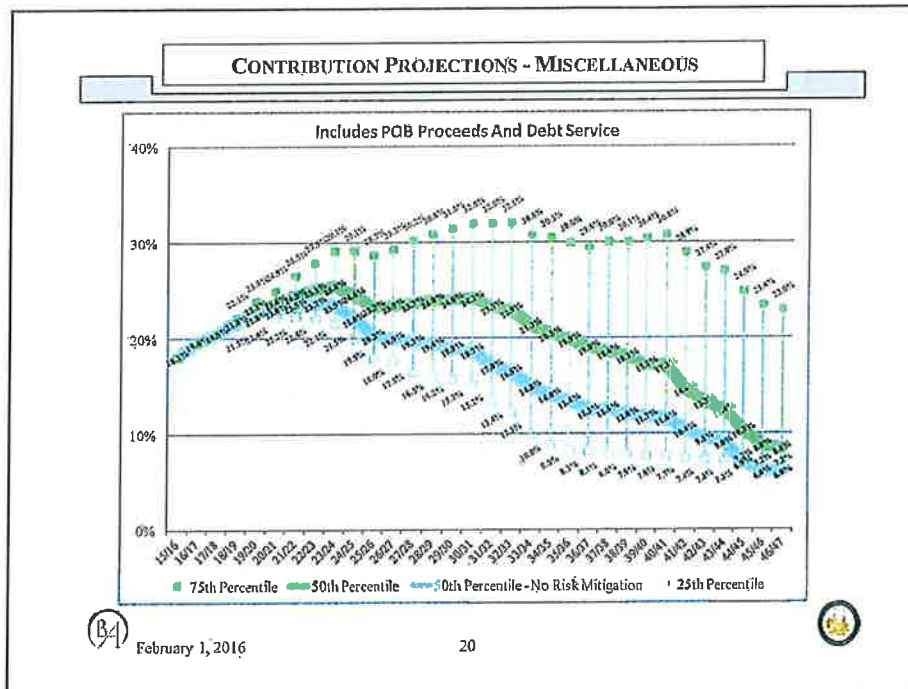
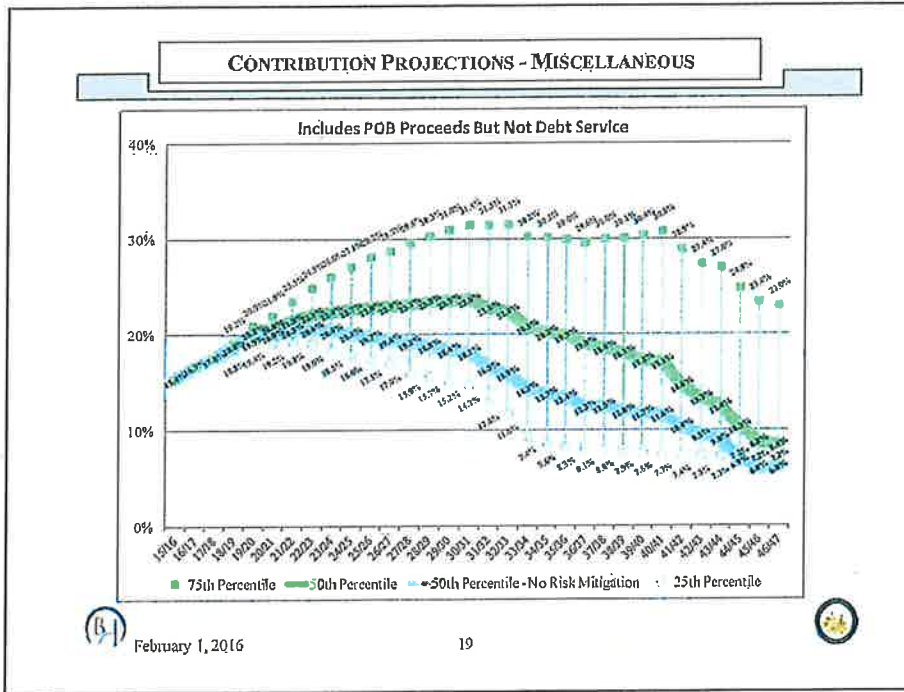
- No Other: Gains/Losses, Method/Assumption Changes, Benefit Improvements
- Excludes Employer Paid Member Contributions (EPMC)
- Includes Tier 2 (2%@60) effective October 1, 2011
- New hire assumptions:
 - Assumes 50% of 2013 new hires will be Classic Tier 2 Members (2%@60) and 50% will be New Members with PEPRA benefits.
 - Assumes Classic Members will decrease from 50% to 0% of new hires over 20 years.

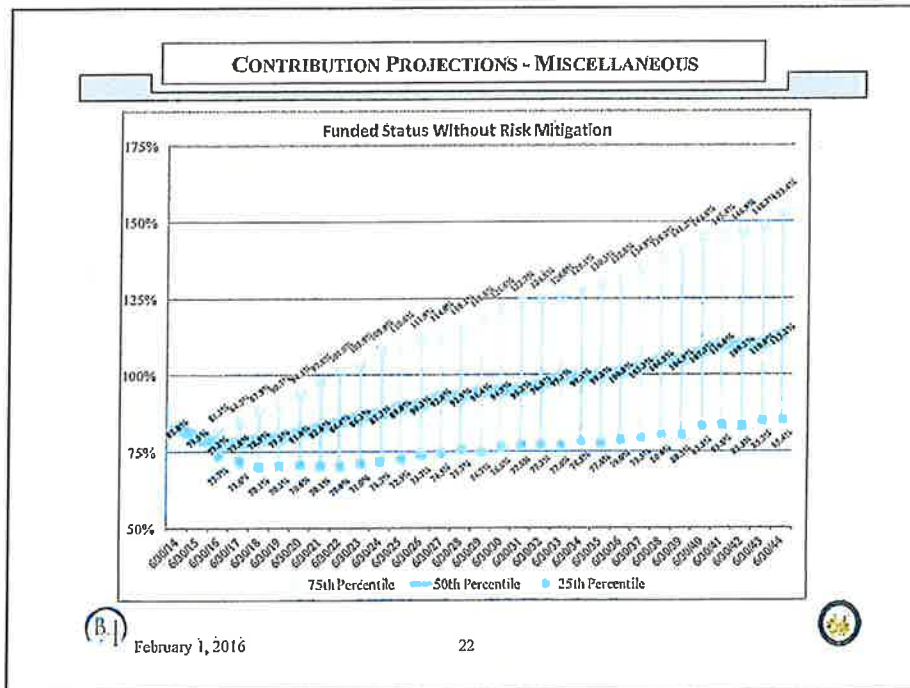
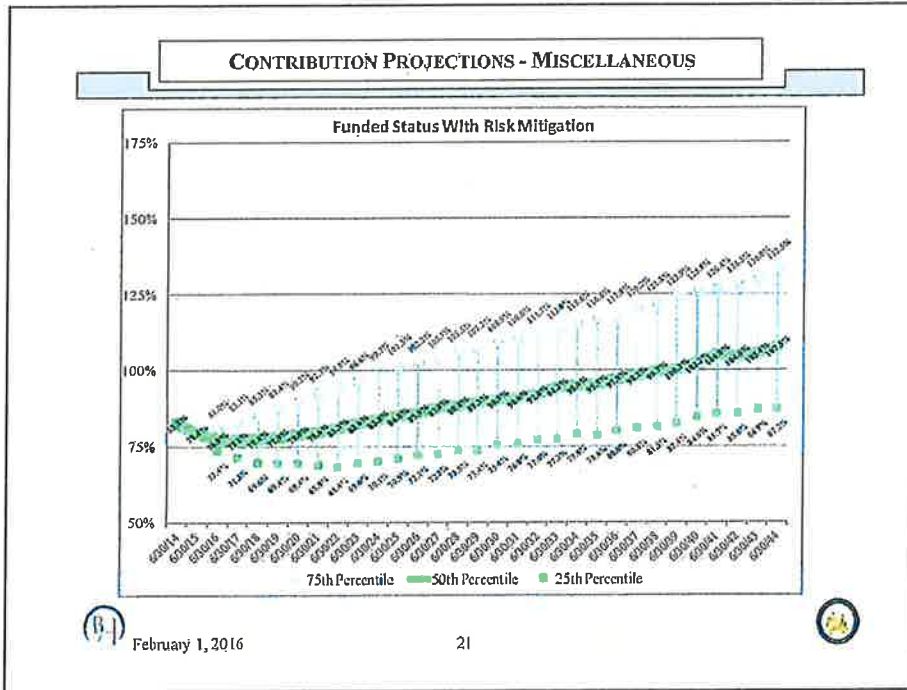
² Based on CalPERS CAFR.
³ June 30, 2016 return based on CalPERS return of (1.0%) through 10/31/15 and assumed future returns for 8 months.


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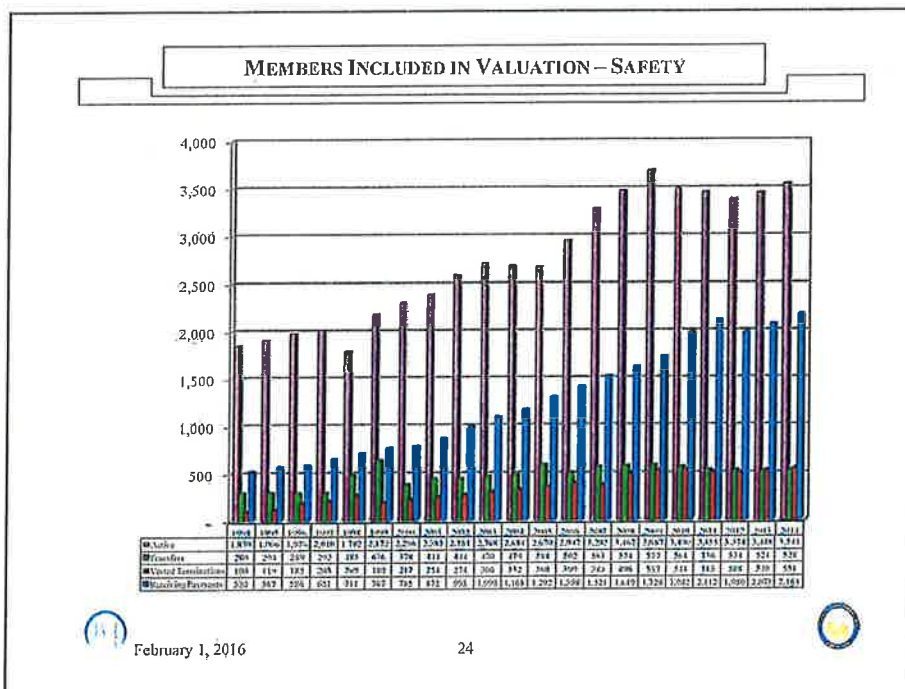
SUMMARY OF DEMOGRAPHIC INFORMATION – SAFETY				
	1994	2004	2013	2014
Actives				
■ Counts	1,839	2,684	3,448	3,541
■ Average				
• Age	38	39	39	39
• County Service	10	9	10	11
• PERSable Wages	\$44,200	\$60,200	\$78,700	\$83,400
■ Total PERSable Wages (millions)	88.8	177.9	296.5	322.5
Receiving Payments				
■ Counts				
• Service		592	1,346	1,411
• Disability		455	545	556
• Beneficiaries		121	182	197
• Total	520	1,168	2,073	2,164
■ Average Annual County Provided Benefit ⁴				
• Service		\$29,100	\$50,600	\$51,300
• Disability		19,700	26,400	26,700
• Service Retirements in last 5 years		31,200	58,100	58,300

⁴ Average County provided pensions are based on County service & County benefit formula, and are not representative of benefits for long service employees.



February 1, 2016

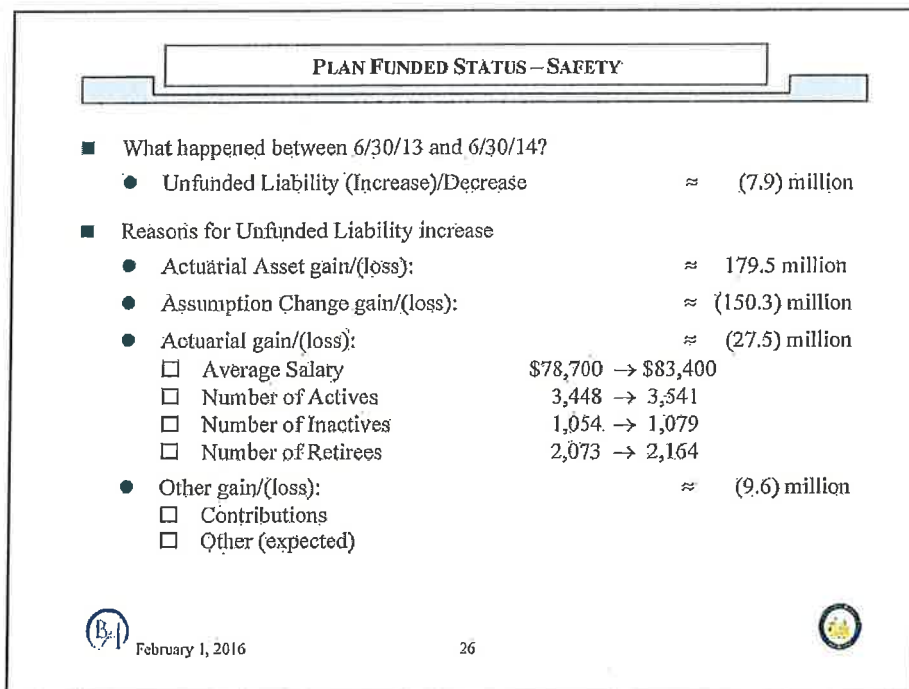
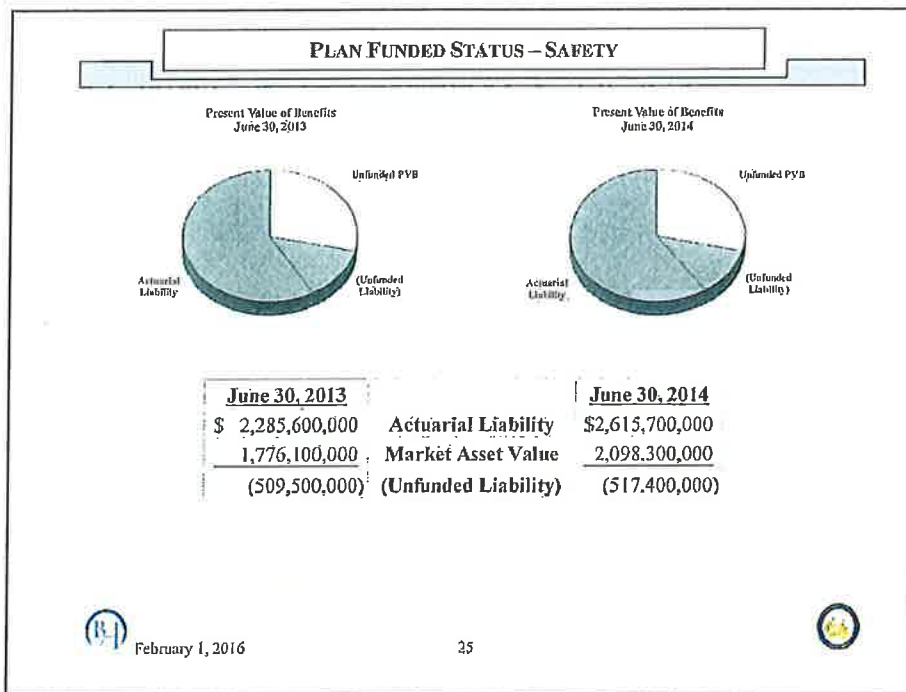
23

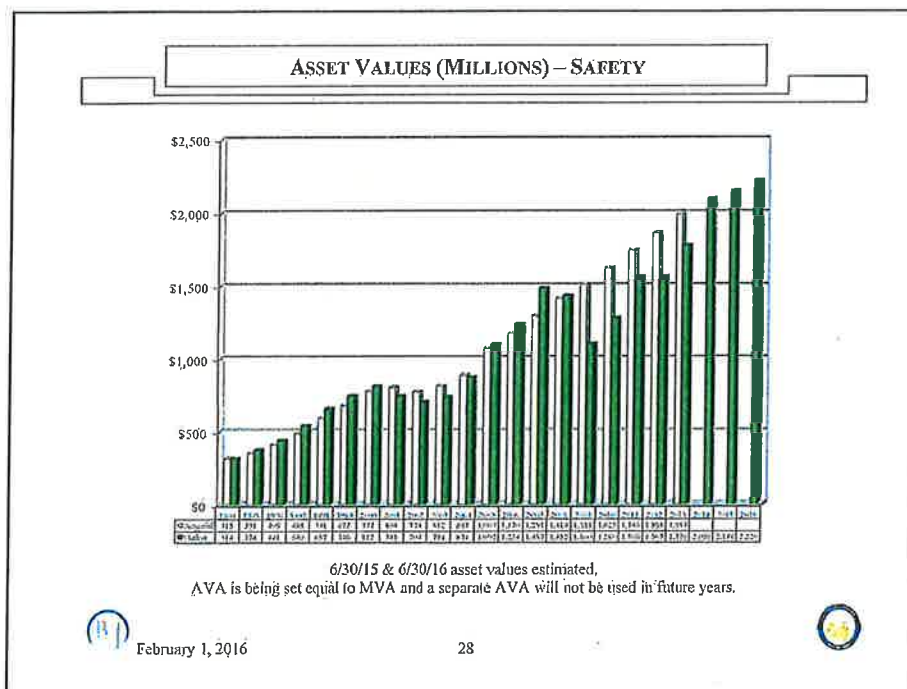
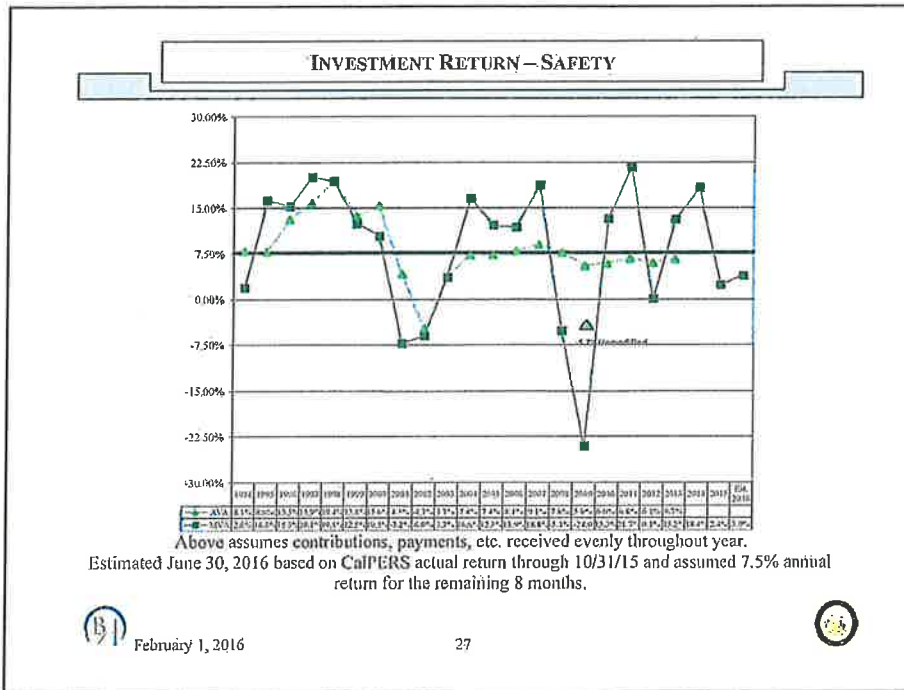


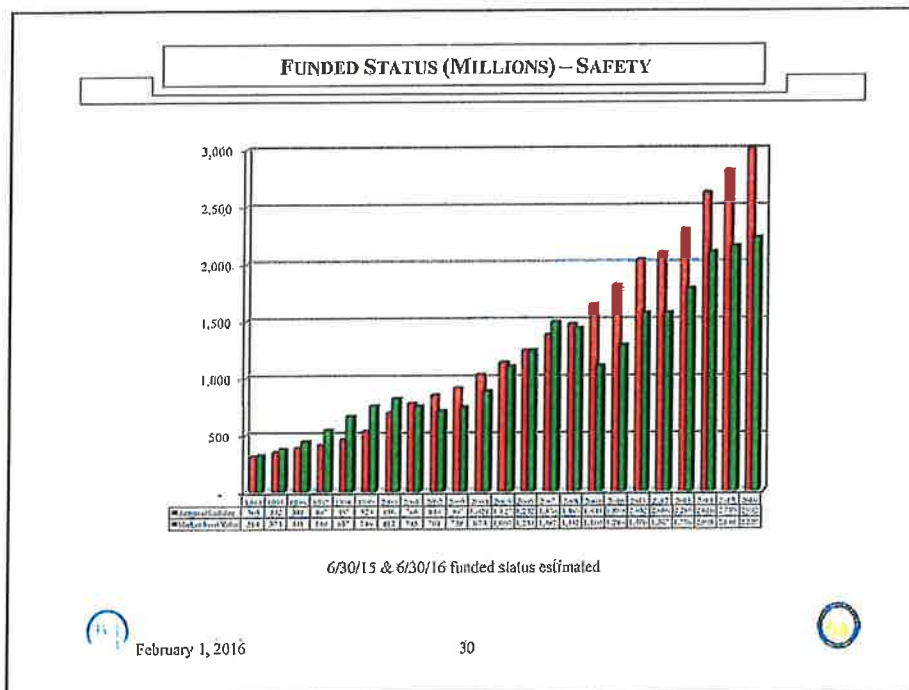
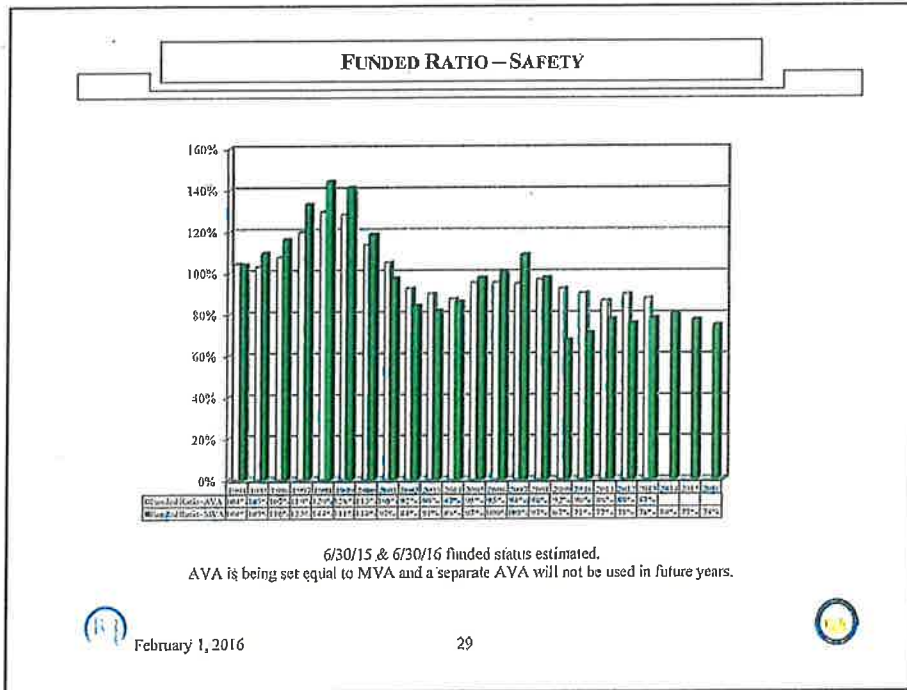
February 1, 2016

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CONTRIBUTION PROJECTIONS – SAFETY

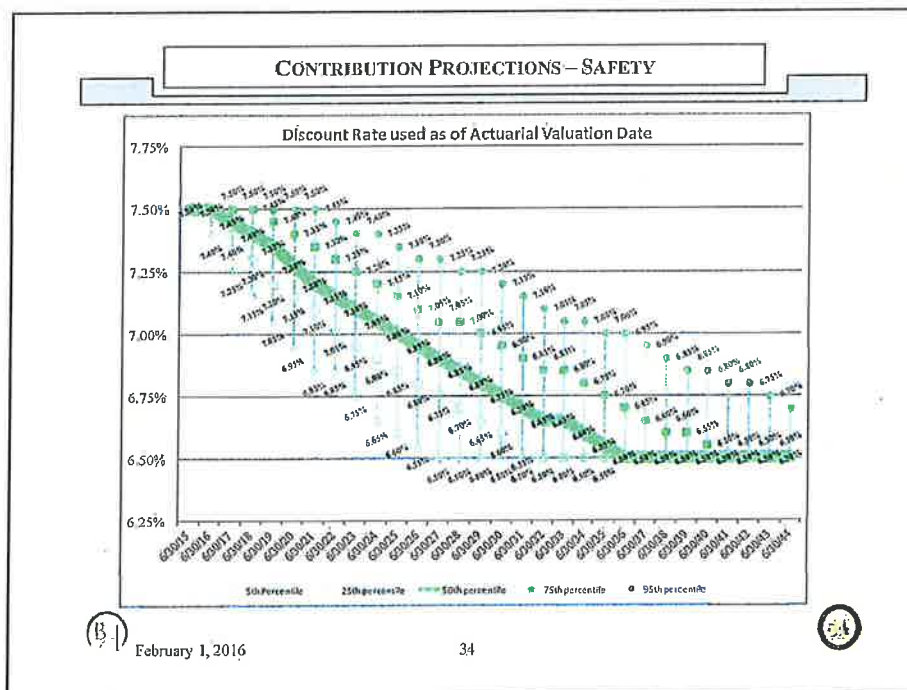
- Market Value Investment Return:
 - June 30, 2013 13.2%⁵
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 - June 30, 2015 2.4%³
 - Future returns⁵ based on stochastic analysis using 1,000 trials

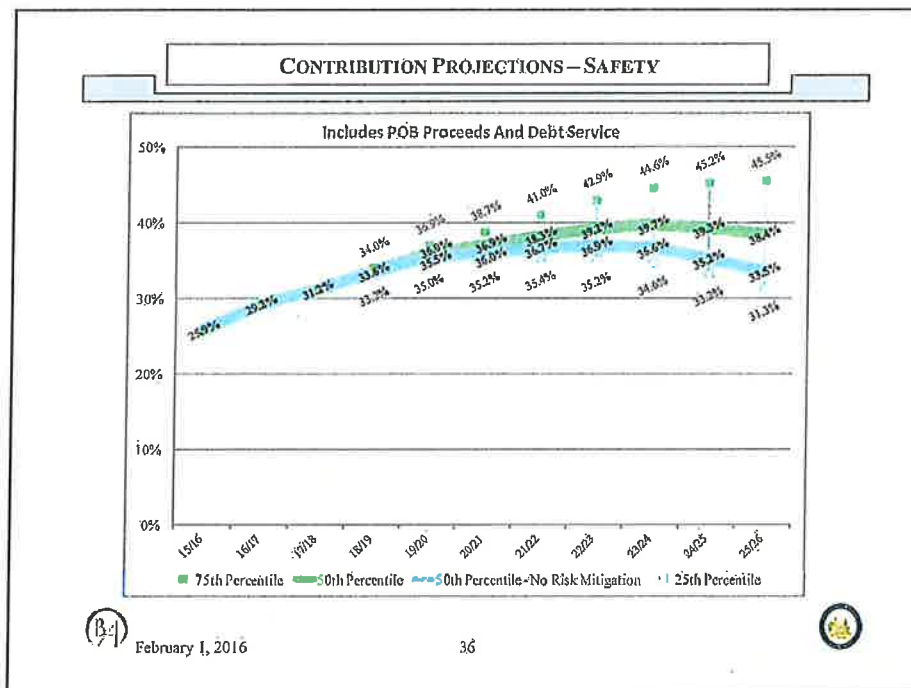
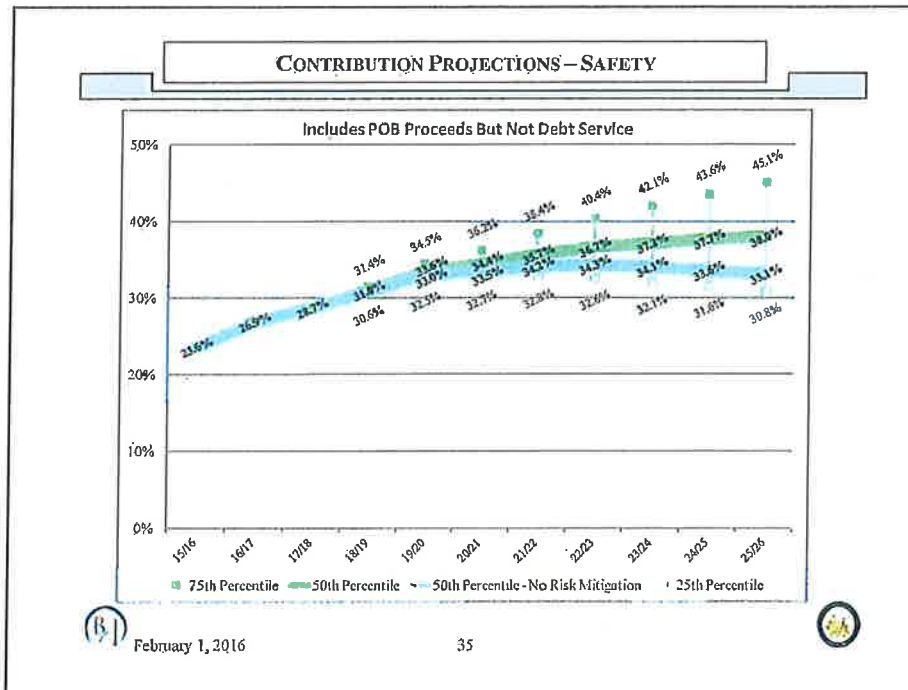
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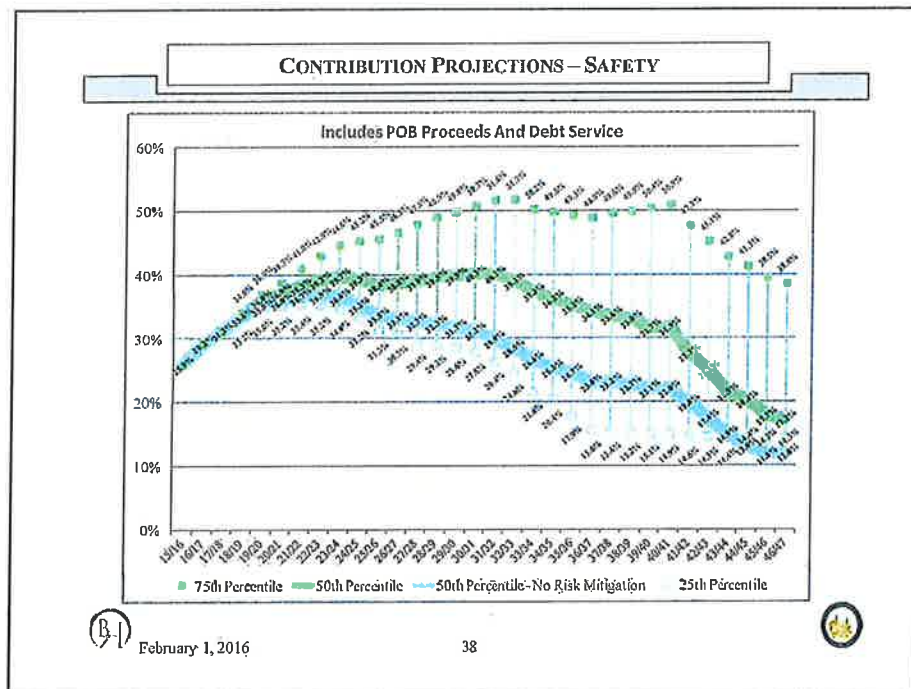
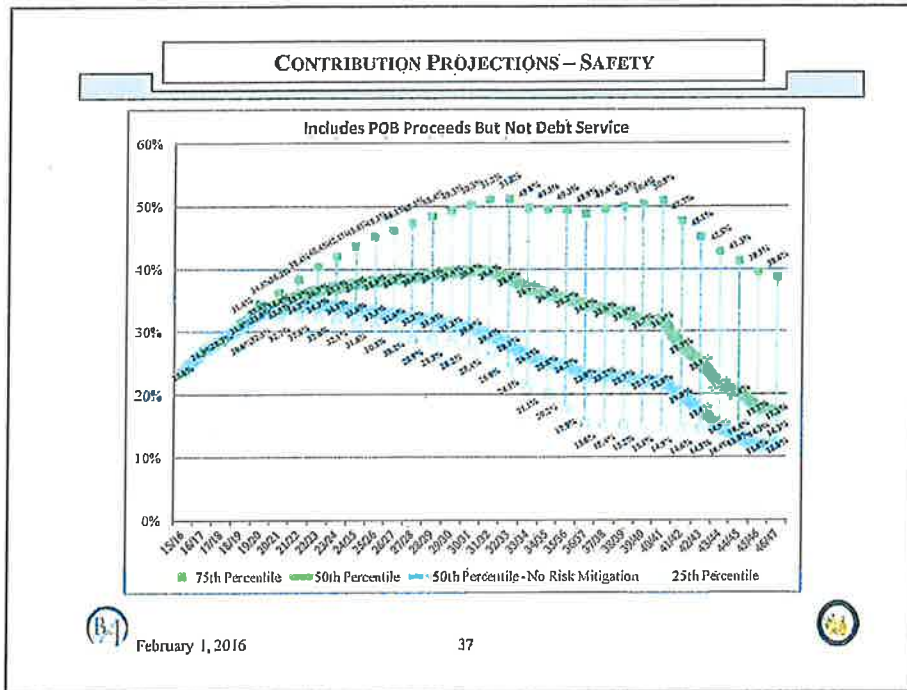
- No Other: Gains/Losses, Method/Assumption Changes, Benefit Improvements
- Excludes Employer Paid Member Contributions (EPMC)
- Includes Tier 2 (2%@50) effective October 1, 2011
- New hire assumptions:
 - Assumes 50% of 2013 new hires will be Classic Tier 2 Members (2%@50) and 50% will be New Members with PEPRAs benefits.
 - Assumes Classic Members will decrease from 50% to 0% of new hires over 10 years.

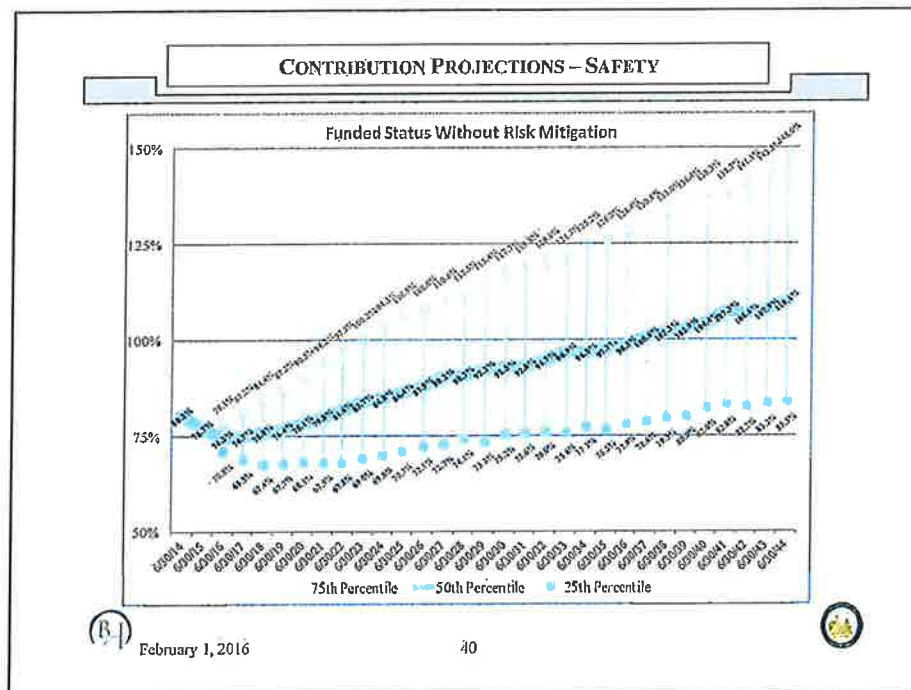
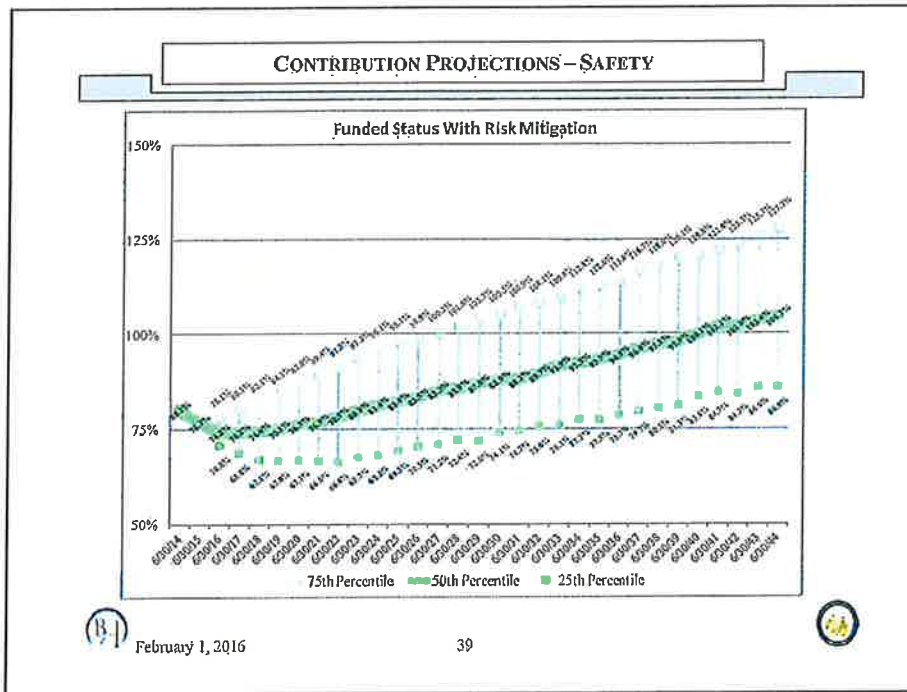
³ Based on CalPERS CAFR.
⁵ June 30, 2016 return based on CalPERS return of (1.0%) through 10/31/15 and assumed future returns for 8 months.

(B) February 1, 2016
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(C)









POB (MILLIONS) BOND PROCEEDS BALANCE			
	<u>Safety</u>	<u>Misc.</u>	<u>Total</u>
■ POB @ 2/16/05	\$ 85.7	\$ 311.2	\$ 396.9
•			
•			
•			
•			
■ Balance @ 6/30/15	90.7	329.4	420.1
■ Earning 7/1/15 - 2/15/16 ⁷	1.6	5.9	7.5
■ Amortization payment through 2/15/16 ⁸	<u>(3.5)</u>	<u>(12.8)</u>	<u>(16.3)</u>
■ Balance @ 2/15/16	88.8	322.5	411.3

⁷ Based on CalPERS actual return through 10/31/15 and assumed 7.5% annual return for the remaining 3.5 months.
⁸ Based on a 28 year closed amortization

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POB (MILLIONS) BOND PROCEEDS BALANCE				
	<u>Payments</u>			<u>Balance</u>
	<u>Principal</u>	<u>Interest</u>	<u>Total</u>	
■ 2/17/05	n/a	n/a	n/a	\$400.0
■ 8/15/05	n/a	\$9.4	\$9.4	400.0
•				
•				
•				
•				
■ 2/15/2015	\$14.0	8.2	22.2	320.5
■ 8/15/2015	n/a	7.8	7.8	320.5
■ 2/15/2016	16.0	7.8	23.8	304.5

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POB (MILLIONS)	
■ Net Estimated Gains through February 15, 2016:	
A. CalPERS Estimated Balance	\$ 411.3
B. Bond Proceeds Balance	304.5
C. Cash Flow Savings/(Deficit) [Payments that would have been paid to CalPERS less POB debt service]	<u>(34.8)</u>
D. Net [(A) - (B) + (C)]	72.0
■ Net Estimated Gains through February 15, 2016:	
E. CalPERS Investment Earnings	\$271.1
F. POB Interest Payments	195.9
G. Cost of Issuance	<u>3.1</u>
H. Net [(E) - (F) - (G)]	72.0
■ Above estimates based on market rate of return.	

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NET FUNDED RATIO (MILLIONS)				
	Safety			
	<u>6/30/13</u>	<u>6/30/14</u>	<u>Proj. 6/30/15⁹</u>	<u>Proj. 6/30/16¹⁰</u>
(1) AAL	\$ 2,286	\$ 2,616	\$ 2,799	\$ 2,992
(2) AVA/MVA ¹¹	<u>1,776</u>	<u>2,098</u>	<u>2,148</u>	<u>2,220</u>
(3) UAAL [(1) - (2)]	510	517	652	772
(4) Funding Ratio [(2)/(1)]	77.7%	80.2%	76.7%	74.2%
(5) POB Balance	\$ 75	\$ 72	\$ 69	\$ 66
(6) Net MVA [(2) - (5)]	1,701	2,026	2,078	2,154
(7) Net Funding Ratio [(6)/(1)]	74.4%	77.5%	74.3%	72.0%

⁹ 6/30/15 CalPERS published rate 2.4%.
¹⁰ Projected 6/30/16 MVA based on CalPERS actual return through 10/31/15 and assumed 7.5% annual return for the remaining 8 months.
¹¹ AVA is being set equal to MVA at 6/30/13 and a separate AVA is not available after 6/30/13.

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NET FUNDED RATIO (MILLIONS)				
	Miscellaneous			
	<u>6/30/13</u>	<u>6/30/14</u>	<u>Proj. 6/30/15</u> ¹²	<u>Proj. 6/30/16</u> ¹³
(1) AAL	\$ 5,009	\$ 5,656	\$ 6,052	\$ 6,470
(2) AVA/MVA ¹⁴	<u>3,974</u>	<u>4,683</u>	<u>4,807</u>	<u>4,978</u>
(3) UAAL [(1) - (2)]	1,035	973	1,246	1,492
(4) Funding Ratio [(2)/(1)]	79.3%	82.8%	79.4%	76.9%
(5) POB Balance	\$ 272	\$ 262	\$ 251	\$ 239
(6) Net MVA [(2) - (5)]	3,702	4,421	4,555	4,740
(7) Net Funding Ratio [(6)/(1)]	73.9%	78.2%	75.3%	73.3%

¹² 6/30/15 CalPERS published rate 2.4%.
¹³ Projected 6/30/16 MVA based on CalPERS actual return through 10/31/15 and assumed 7.5% annual return for the remaining 8 months.
¹⁴ AVA is being set equal to MVA at 6/30/13 and a separate AVA is not available after 6/30/13.

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NET FUNDED RATIO (MILLIONS)				
	Total			
	<u>6/30/13</u>	<u>6/30/14</u>	<u>Proj. 6/30/15</u> ¹⁵	<u>Proj. 6/30/16</u> ¹⁶
(1) AAL	\$ 7,295	\$ 8,272	\$ 8,852	\$ 9,462
(2) AVA/MVA ¹⁷	<u>5,750</u>	<u>6,781</u>	<u>6,954</u>	<u>7,199</u>
(3) UAAL [(1) - (2)]	1,545	1,491	1,897	2,263
(4) Funding Ratio [(2)/(1)]	78.8%	82.0%	78.6%	76.1%
(5) POB Balance	\$ 347	\$ 335	\$ 320	\$ 305
(6) Net MVA [(2) - (5)]	5,403	6,447	6,634	6,894
(7) Net Funding Ratio [(6)/(1)]	74.1%	77.9%	74.9%	72.9%

¹⁵ 6/30/15 CalPERS published rate 2.4%.
¹⁶ Projected 6/30/16 MVA based on CalPERS actual return through 10/31/15 and assumed 7.5% annual return for the remaining 8 months.
¹⁷ AVA is being set equal to MVA at 6/30/13 and a separate AVA is not available after 6/30/13.

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PEPRA COST SHARING

- Target of 50% of total normal cost for everyone
- *New members* must pay greater of 50% of total normal cost or bargained amount if higher
- Employer cannot pay any part of *new member* required employee contributions
- Employer may impose current employees pay 50% of total normal cost (limited to certain amounts) if not agreed through collective bargaining by 1/1/18
- Miscellaneous Plan:

	<u>Current Members</u>	<u>New Members</u>
	<u>3% @ 60</u>	<u>2% @ 60</u>
● Employer Normal Cost	10.9%	7.0%
● Member Normal Cost	<u>7.8%</u>	<u>6.8%</u>
● Total Normal Cost	18.7%	13.8%
● 50% Target	9.35%	6.9%

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PEPRA COST SHARING



- Safety Plan:

	<u>Current Members</u>	<u>New Members</u>
	<u>3% @ 50</u>	<u>2.7% @ 57</u>
● Employer Normal Cost	18.6%	14.5%
● Member Normal Cost	<u>8.9%</u>	<u>8.9%</u>
● Total Normal Cost	27.5%	23.4%
● 50% Target	13.75%	11.7%

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PAYING DOWN THE UNFUNDED LIABILITY

- Pension Obligation Bond (POB)
 - Interest arbitrage between expected CalPERS earnings and rate paid on POB
 - Not guaranteed
- Borrow from General Fund
 - Pay GF back like a loan
 - Payments come from all funds
- Request shorter amortization period of CalPERS
 - Higher short term payments
 - Less interest and lower long term payments
- One time payments
 - County resolution to use portion of one time money


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PAYING DOWN THE UNFUNDED LIABILITY

- Internal Service Fund
 - Restricted investments
 - Likely low (0.5% - 1.0%) investment returns
 - Short term/high quality
 - Designed for preservation of principal
 - Assets could be used by Board of Supervisors for other purposes
- Irrevocable Supplemental (§115) Pension Trust
 - A few trusts established
 - PARS & PFM
 - Investments significantly less restricted
 - Designed for long term returns
 - Likely much higher (5% - 7%) investment return
 - Assets could not be used by Board of Supervisors for other purposes
 - Can only be used to
 - Reimburse County for CalPERS contributions
 - Make payments directly to CalPERS


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California Public Employees' Retirement System
 Actuarial Office
 P.O. Box 942701
 Sacramento, CA 94229-2701
 TTY: (916) 795-3240
 (888) 225-7377 phone • (916) 795-2744 fax
www.calpers.ca.gov

October 2015

**MISCELLANEOUS PLAN OF THE COUNTY OF RIVERSIDE (CalPERS ID: 5982690295)
 Annual Valuation Report as of June 30, 2014**

Dear Employer,

As an attachment to this letter, you will find a copy of the June 30, 2014 actuarial valuation report of your pension plan. Your 2014 actuarial valuation report contains important actuarial information about your pension plan at CalPERS. Your CalPERS staff actuary, whose signature appears in the Actuarial Certification Section on page 1, is available to discuss the report with you after November 30, 2015.

Future Contribution Rates

The exhibit below displays the Minimum Employer Contribution Rate for Fiscal Year 2016-17 and a projected contribution rate for 2017-18, before any cost sharing. The projected rate for 2017-18 is based on the most recent information available, including an estimate of the investment return for Fiscal Year 2014-15, namely 2.4 percent. For a projection of employer rates beyond 2017-18, please refer to the "Projected Rates" in the "Risk Analysis" section, which includes rate projections through 2021-22. The 5-year projection of future employer contribution rates supersedes any previous projections we have provided. The Risk Analysis section of your valuation report also contains estimated employer contribution rates in future years under a variety of investment return scenarios.

Fiscal Year	Employer Contribution Rate
2016-17	16.476%
2017-18	17.7% (projected)

Member contributions other than cost sharing (whether paid by the employer or the employee) are in addition to the above rates. **The employer contribution rates in this report do not reflect any cost sharing arrangement you may have with your employees.**

The estimate for 2017-18 also assumes that there are no future contract amendments and no liability gains or losses (such as larger than expected pay increases, more retirements than expected, etc.). This is a very important assumption because these gains and losses do occur and can have a significant impact on your contribution rate. Even for the largest plans, such gains and losses often cause a change in the employer's contribution rate of one or two percent of payroll and may be even larger in some less common instances. These gains and losses cannot be predicted in advance so the projected employer contribution rates are just estimates. Your actual rate for 2017-18 will be provided in next year's report.

Changes since the Prior Year's Valuation

This actuarial valuation includes Board adopted changes to the demographic assumptions based on the most recent experience study report. The most significant of these is the improvement in post-retirement mortality acknowledging the greater life expectancies we are seeing in our membership and expected continued improvements. The actuarial assumptions and methods used in CalPERS public agency valuations are approved by the Board of Administration upon the recommendation of the Chief Actuary. The individual plan actuary whose signature appears in the actuarial certification in the accompanying report does not set plan specific actuarial assumptions.

Besides the above noted changes, there may also be changes specific to your plan such as contract amendments and funding changes.

Further descriptions of general changes are included in the "Highlights and Executive Summary" section and in Appendix A, "Actuarial Methods and Assumptions." The effect of the changes on your rate is included in the "Reconciliation of Required Employer Contributions" Section.

Effective with the 2014 actuarial valuation, Governmental Accounting Standards Board Statement No. 27 financial reporting information is no longer provided in CalPERS annual actuarial valuation reports. GASB 27 has been replaced with GASB 68 for financial statement reporting purposes. CalPERS is providing separate accounting valuation reports on a fee for service basis for our public agency employers. More details on GASB 68 and instructions for ordering your GASB 68 report are available on our website.

Potential Changes to Future Year Valuations

One of CalPERS strategic goals is to improve the long-term pension benefit sustainability of the system through an integrated view of pension assets and liabilities. The Board of Administration has been engaging in discussions on the funding risks faced by the system and possible risk mitigation strategies to better protect our members. Recent Board actions on a new asset allocation, new actuarial assumptions and new smoothing and amortization policies have already lowered risk. However, future contribution rate volatility is expected as CalPERS pension plans continue to mature. Two approaches under consideration are a flexible glide path methodology, a lowering of the discount rate and expected investment volatility following a great investment return and a blended glide path methodology which is similar to the flexible glide path but with check points over time that would trigger additional asset allocation changes and lowering of the discount rate if investment returns did not result in a sufficient reduction in volatility. Either approach requires thoughtful discussion as it involves tradeoffs between short and long-term system impacts and potential future increases in required contributions. Additional information can be found on the CalPERS website with possible Board action on risk mitigation strategy and policy at the November 2015 Board meeting.

We understand that you might have a number of questions about these results. While we are very interested in discussing these results with your agency, in the interest of allowing us to give every public agency their results, we ask that you wait until after November 30 to contact us with actuarial questions. If you have other questions, you may call the Customer Contact Center at (888)-CalPERS or **(888-225-7377)**.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan Milligan". The signature is fluid and cursive, with a long horizontal stroke at the end.

ALAN MILLIGAN
Chief Actuary



ACTUARIAL VALUATION
as of June 30, 2014

**for the
MISCELLANEOUS PLAN
of the
COUNTY OF RIVERSIDE**
(CalPERS ID: 5982690295)
(Rate Plan ID: 62)

**REQUIRED CONTRIBUTIONS
FOR FISCAL YEAR
July 1, 2016 – June 30, 2017**

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ACTUARIAL CERTIFICATION

To the best of our knowledge, this report is complete and accurate and contains sufficient information to disclose, fully and fairly, the funded condition of the MISCELLANEOUS PLAN OF THE COUNTY OF RIVERSIDE. This valuation is based on the member and financial data as of June 30, 2014 provided by the various CalPERS databases and the benefits under this plan with CalPERS as of the date this report was produced. It is our opinion that the valuation has been performed in accordance with generally accepted actuarial principles, in accordance with standards of practice prescribed by the Actuarial Standards Board, and that the assumptions and methods are internally consistent and reasonable for this plan, as prescribed by the CalPERS Board of Administration according to provisions set forth in the California Public Employees' Retirement Law.

The undersigned is an actuary for CalPERS, who is a member of the American Academy of Actuaries and the Society of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.



TODD TAUZER, FSA, CERA, MAAA
Senior Pension Actuary, CalPERS

HIGHLIGHTS AND EXECUTIVE SUMMARY

- **INTRODUCTION**
- **PURPOSE OF THE REPORT**
- **REQUIRED EMPLOYER CONTRIBUTION**
- **PLAN'S FUNDED STATUS**
- **COST**
- **CHANGES SINCE THE PRIOR YEAR'S VALUATION**
- **SUBSEQUENT EVENTS**

Introduction

This report presents the results of the June 30, 2014 actuarial valuation of the MISCELLANEOUS PLAN OF THE COUNTY OF RIVERSIDE of the California Public Employees' Retirement System (CalPERS). This actuarial valuation sets the Fiscal Year 2016-17 required employer contribution rates.

This actuarial valuation includes Board adopted changes to the demographic assumptions based on the most recent experience study report. The most significant of these is the improvement in post-retirement mortality acknowledging the greater life expectancies we are seeing in our membership and expected continued improvements. The actuarial assumptions and methods used in CalPERS public agency valuations are approved by the Board of Administration upon the recommendation of the Chief Actuary. The individual plan actuary whose signature appears in the actuarial certification in this report does not set plan specific actuarial assumptions.

Effective with the 2014 actuarial valuation, Governmental Accounting Standards Board Statement No. 27 financial reporting information is no longer provided in CalPERS annual actuarial valuation reports. GASB 27 has been replaced with GASB 68 for financial statement reporting purposes. CalPERS is providing separate accounting valuation reports on a fee for service basis for our public agency employers. More details on GASB 68 and instructions for ordering your GASB 68 report are available on our website.

Purpose of the Report

The actuarial valuation was prepared by the CalPERS Actuarial Office using data as of June 30, 2014. The purpose of the report is to:

- Set forth the assets and accrued liabilities of this plan as of June 30, 2014;
- Determine the required employer contribution rate for the Fiscal Year July 1, 2016 through June 30, 2017;
- Provide actuarial information as of June 30, 2014 to the CalPERS Board of Administration and other interested parties.

The pension funding information presented in this report should not be used in financial reports subject to Governmental Accounting Standards Board (GASB) Statement Number 68 for an Agent Employer Defined Benefit Pension Plan. A separate accounting valuation report for such purposes is available from CalPERS and details for ordering are available on our website.

The use of this report for any other purposes may be inappropriate. In particular, this report does not contain information applicable to alternative benefit costs. The employer should contact their actuary before disseminating any portion of this report for any reason that is not explicitly described above.

California Actuarial Advisory Panel Recommendations

This report includes all the basic disclosure elements as described in the *Model Disclosure Elements for Actuarial Valuation Reports* recommended in 2011 by the California Actuarial Advisory Panel (CAAP), with the exception of including the original base amounts of the various components of the unfunded liability in the Schedule of Amortization Bases shown on page 14.

Additionally, this report includes the following "Enhanced Risk Disclosures" also recommended by the CAAP in the Model Disclosure Elements document:

- A "Deterministic Stress Test," projecting future results under different investment income scenarios
- A "Sensitivity Analysis," showing the impact on current valuation results using a 1 percent plus or minus change in the discount rate.

Required Employer Contribution

	Fiscal Year 2015-16	Fiscal Year 2016-17
Actuarially Determined Employer Contributions		
1. Contribution in Projected Dollars		
a) Total Normal Cost	\$ 169,204,807	\$ 179,326,448
b) Employee Contribution ¹	72,083,101	74,878,722
c) Employer Normal Cost [(1a) – (1b)]	97,121,706	104,447,726
d) Unfunded Liability Contribution	47,296,668	57,139,513
e) Required Employer Contribution [(1c) + (1d)]	\$ 144,418,374	\$ 161,587,239
Projected Annual Payroll for Contribution Year	\$ 936,022,607	\$ 980,729,819
2. Contribution as a Percentage of Payroll		
a) Total Normal Cost	18.077%	18.285%
b) Employee Contribution ¹	7.701%	7.635%
c) Employer Normal Cost [(2a) – (2b)]	10.376%	10.650%
d) Unfunded Liability Rate	5.053%	5.826%
e) Required Employer Rate [(2c) + (2d)]	15.429%	16.476%
Minimum Employer Contribution Rate²	15.429%	16.476%
Annual Lump Sum Prepayment Option ³	\$ 139,289,449	\$ 155,848,572

¹ For classic members this is the percentage specified in the Public Employees Retirement Law, net of any reduction from the use of a modified formula or other factors. For PEPRAs members, the member contribution rate is based on 50 percent of the normal cost. A development of PEPRAs member contribution rates can be found in Appendix D. Employee cost sharing is not shown in this report.

² The Minimum Employer Contribution Rate under PEPRAs is the greater of the required employer rate or the employer normal cost. The timing of contributions made during the year coincides with the employer's payroll reporting periods. § 20572 of the Public Employees' Retirement Law assesses interest at an annual rate of 10 percent if a contracting agency fails to remit the required contributions when due.

³ The Annual Lump Sum Prepayment can be made between July 1 and July 15 and should be made before the contributions for the first payroll reporting period of the new fiscal year are due. If there is contractual cost sharing or other change, this amount will change.

Plan's Funded Status

	June 30, 2013	June 30, 2014
1. Present Value of Projected Benefits	\$ 6,229,128,605	\$ 6,911,347,405
2. Entry Age Normal Accrued Liability	5,008,806,968	5,656,121,103
3. Market Value of Assets (MVA)	\$ 3,974,442,195	\$ 4,682,894,962
4. Unfunded Liability [(2) – (3)]	\$ 1,034,364,773	\$ 973,226,141
5. Funded Ratio [(3) / (2)]	79.3%	82.8%



Actuarial Cost Estimates in General

What will this pension plan cost? Unfortunately, there is no simple answer. There are two major reasons for the complexity of the answer. First, actuarial calculations, including the ones in this report, are based on a number of assumptions about the future. These assumptions can be divided into two categories.

- Demographic assumptions include the percentage of employees that will terminate, die, become disabled, and retire in each future year.
- Economic assumptions include future salary increases for each active employee, and the assumption with the greatest impact, future asset returns at CalPERS for each year into the future until the last dollar is paid to current members of your plan.

While CalPERS has set these assumptions to reflect our best estimate of the real future of your plan, it must be understood that these assumptions are very long-term predictors and will surely not be realized in any one year. For example, while the asset earnings at CalPERS have averaged more than the assumed return of 7.5 percent for the past twenty year period ending June 30, 2014, returns for each fiscal year ranged from negative -24 percent to +21.7 percent.

Second, the very nature of actuarial funding produces the answer to the question of plan cost as the sum of two separate pieces.

- The Normal Cost (i.e., the annual cost associated with one year of service accrual) expressed as a percentage of total active payroll.
- The Past Service Cost or Accrued Liability (i.e., the current value of the benefit for all credited past service of current members) which is expressed as a lump sum dollar amount.

The cost is the sum of a percent of future pay and a lump sum dollar amount. To communicate the total cost, either the Normal Cost must be converted to a lump sum dollar amount or the Past Service Cost must be converted to a percent of payroll. Converting the Past Service Cost lump sum to a percent of payroll requires a specific amortization period, and the employer rate will vary depending on the amortization period chosen. CalPERS Board amortization and smoothing policies specify the amortization period used for each amortization base. These policies permit a restructuring of the amortization bases (also known as a "fresh start") when the application of the amortization policy would not otherwise achieve the goals of the policy – to eliminate the unfunded liabilities in a manner that maintains benefit security while minimizing substantial variations in employer contribution rates. Currently unfunded liabilities are paid as a percent of payroll. However, in the future, unfunded liabilities may be billed as dollar amounts as is the case for plans that are in risk pools.

Changes since the Prior Year's Valuation

Benefits

The standard actuarial practice at CalPERS is to recognize mandated legislative benefit changes in the first annual valuation following the effective date of the legislation. Voluntary benefit changes by plan amendment are generally included in the first valuation that is prepared after the amendment becomes effective even if the valuation date is prior to the effective date of the amendment.

This valuation generally reflects plan changes by amendments effective before the date of the report. Please refer to the "Plan's Major Benefit Options" and Appendix B for a summary of the plan provisions used in this valuation. The effect of any mandated benefit changes or plan amendments on the unfunded liability is shown in the "(Gain)/Loss Analysis" and the effect on your employer contribution rate is shown in the "Reconciliation of Required Employer Contributions." It should be noted that no change in liability or rate is shown for any plan changes which were already included in the prior year's valuation.

Actuarial Methods and Assumptions

The CalPERS Board of Administration approved several changes to the demographic assumptions that more closely align with actual experience based on the most recent experience study. The most significant of these is mortality improvement to acknowledge the greater life expectancies we are seeing in our membership and expected continued improvements. The new actuarial assumptions are used to set the Fiscal Year 2016-17 contribution rates for public agency employers. The increase in liability due to new actuarial assumptions calculated in this actuarial valuation is amortized over a 20-year period with a 5-year ramp-up/ramp-down in accordance with Board amortization policy.

Subsequent Events

Actuarial Methods and Assumptions

One of CalPERS strategic goals is to improve the long-term pension benefit sustainability of the system through an integrated view of pension assets and liabilities. The Board of Administration has been engaging in discussions on the funding risks faced by the system and possible risk mitigation strategies to better protect our members. Recent Board actions on a new asset allocation, new actuarial assumptions and new smoothing and amortization policies have already lowered risk. However, future contribution rate volatility is expected as CalPERS pension plans continue to mature. Two approaches under consideration are a flexible glide path methodology, a lowering of the discount rate and expected investment volatility following a great investment return and a blended glide path methodology which is similar to the flexible glide path but with check points over time that would trigger additional asset allocation changes and lowering of the discount rate if investment returns did not result in a sufficient reduction in volatility. Either approach requires thoughtful discussion as it involves tradeoffs between short and long-term system impacts and potential future increases in required contributions. Additional information can be found on the CalPERS website with possible Board action on risk mitigation strategy and policy at the November 2015 Board meeting.

ASSETS

- **RECONCILIATION OF THE MARKET VALUE OF ASSETS**
- **ASSET ALLOCATION**
- **CALPERS HISTORY OF INVESTMENT RETURNS**

Reconciliation of the Market Value of Assets

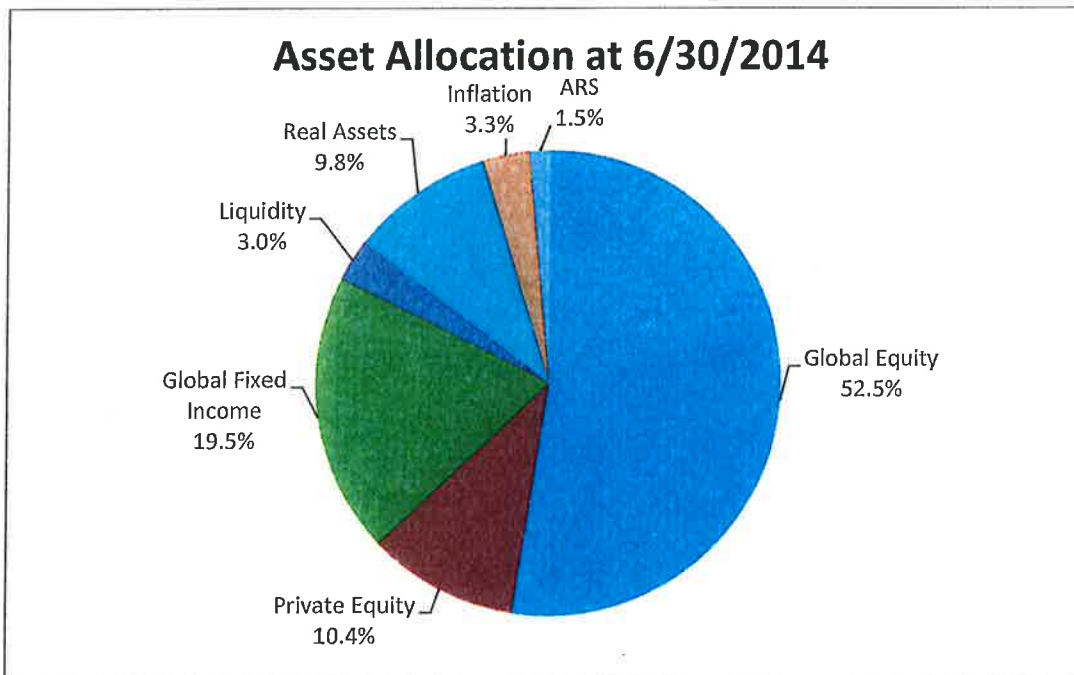
1. Market Value of Assets as of 6/30/13 Including Receivables	\$ 3,974,442,195
2. Change in Receivables for Service Buybacks as of 6/30/13	826,692
3. Employer Contributions	140,971,927
4. Employee Contributions	67,168,909
5. Benefit Payments to Retirees and Beneficiaries	(196,389,441)
6. Refunds	(8,171,365)
7. Lump Sum Payments	0
8. Transfers and Miscellaneous Adjustments	5,970,933
9. Investment Return	698,075,112
10. Market Value of Assets as of 6/30/14 Including Receivables	\$ 4,682,894,962

Asset Allocation

CalPERS adheres to an Asset Allocation Strategy which establishes asset class allocation policy targets and ranges, and manages those asset class allocations within their policy ranges. CalPERS Investment Belief No. 6 recognizes that strategic asset allocation is the dominant determinant of portfolio risk and return. On February 19, 2014 the CalPERS Board of Administration adopted changes to the current asset allocation as shown in the Policy Target Allocation below expressed as percentage of total assets. The asset allocation has an expected long term blended rate of return of 7.5 percent.

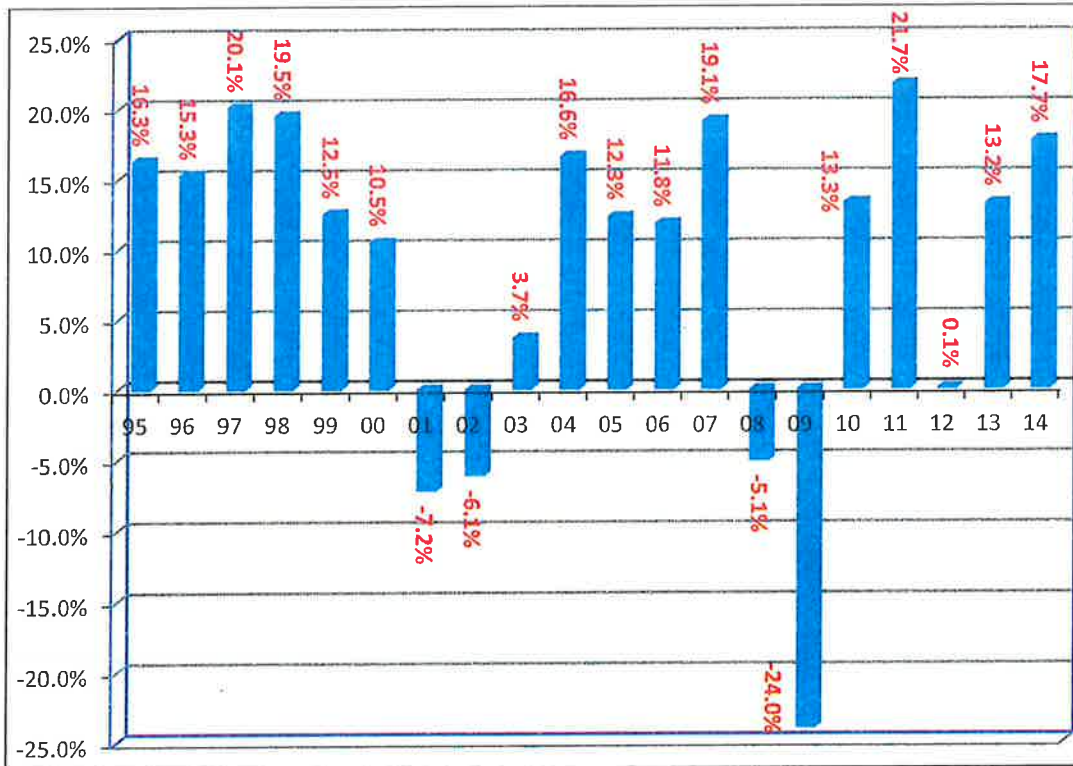
The asset allocation and market value of assets shown below reflect the values of the Public Employees Retirement Fund (PERF) in its entirety as of June 30, 2014. The assets for COUNTY OF RIVERSIDE MISCELLANEOUS PLAN are part of the Public Employees Retirement Fund (PERF) and are invested accordingly.

(A) Asset Class	(B) Market Value (\$ Billion)	(C) Policy Target Allocation
Global Equity	158.2	50.0%
Private Equity	31.5	14.0%
Global Fixed Income	58.8	17.0%
Liquidity	9.0	4.0%
Real Assets	29.6	11.0%
Inflation Sensitive Assets	9.9	4.0%
Absolute Return Strategy (ARS)	4.5	0.0%
Total Fund	\$301.5	100.0%



CalPERS History of Investment Returns

The following is a chart with the 20-year historical annual returns of the Public Employees Retirement Fund for each fiscal year ending on June 30. Beginning in 2002, the figures are reported as gross of fees.



The table below shows historical geometric mean annual returns of the Public Employees Retirement Fund for various time periods ending on June 30, 2014, (figures are reported as gross of fees). The geometric mean rate of return is the average rate per period compounded over multiple periods. It should be recognized that in any given year the rate of return is volatile. Although the expected rate of return on the recently adopted new asset allocation is 7.5 percent, the portfolio has an expected volatility of 11.76 percent per year. The volatility is a measure of the risk of the portfolio expressed in the standard deviation of the fund's total return distribution, expressed in percent. Consequently when looking at investment returns it is more instructive to look at returns over longer time horizons.

History of CalPERS Geometric Mean Rates of Return and Volatilities					
	1 year	5 year	10 year	20 year	30 year
Geometric Return	17.7%	13.0%	7.1%	8.4%	10.1%
Volatility	-	8.1%	14.0%	11.9%	11.4%

LIABILITIES AND RATES

- **DEVELOPMENT OF ACCRUED AND UNFUNDED LIABILITIES**
- **(GAIN) / LOSS ANALYSIS 06/30/13 - 06/30/14**
- **SCHEDULE OF AMORTIZATION BASES**
- **ALTERNATE AMORTIZATION SCHEDULES**
- **RECONCILIATION OF REQUIRED EMPLOYER CONTRIBUTIONS**
- **EMPLOYER CONTRIBUTION RATE HISTORY**
- **FUNDING HISTORY**

Development of Accrued and Unfunded Liabilities

		Prior Year Assumptions	New Assumptions
	June 30, 2013	June 30, 2014	June 30, 2014
1. Present Value of Projected Benefits			
a) Active Members	\$ 3,630,284,201	3,830,053,447	4,025,560,174
b) Transferred Members	226,155,790	230,815,861	241,916,181
c) Terminated Members	129,361,497	140,124,523	127,782,343
d) Members and Beneficiaries Receiving Payments	2,243,327,117	2,399,330,955	2,516,088,707
e) Total	\$ 6,229,128,605	6,600,324,786	6,911,347,405
2. Present Value of Future Employer Normal Costs	\$ 676,184,063	672,840,155	703,543,618
3. Present Value of Future Employee Contributions	\$ 544,137,574	560,179,746	551,682,684
4. Entry Age Normal Accrued Liability			
a) Active Members [(1a) - (2) - (3)]	\$ 2,409,962,564	2,597,033,546	2,770,333,872
b) Transferred Members (1b)	226,155,790	230,815,861	241,916,181
c) Terminated Members (1c)	129,361,497	140,124,523	127,782,343
d) Members and Beneficiaries Receiving Payments (1d)	2,243,327,117	2,399,330,955	2,516,088,707
e) Total	\$ 5,008,806,968	5,367,304,885	5,656,121,103
5. Market Value of Assets (MVA)	\$ 3,974,442,195	4,682,894,962	4,682,894,962
6. Unfunded Liability [(4e) - (5)]	\$ 1,034,364,773	684,409,923	973,226,141
7. Funded Ratio [(5) / (4e)]	79.3%	87.2%	82.8%

(Gain) /Loss Analysis 6/30/13 - 6/30/14

To calculate the cost requirements of the plan, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is compared to the expected experience based on the actuarial assumptions. This results in actuarial gains or losses, as shown below.

A Total (Gain)/Loss for the Year	
1. Unfunded Accrued Liability (UAL) as of 6/30/13	\$ 1,034,364,773
2. Expected Payment on the UAL during 2013/2014	46,496,740
3. Interest through 6/30/14 $[\.075 \times (A1) - ((1.075)^{\frac{1}{2}} - 1) \times (A2)]$	75,865,252
4. Expected UAL before all other changes $[(A1) - (A2) + (A3)]$	1,063,733,285
5. Change due to plan changes	0
6. Change due to assumption change	288,816,218
7. Expected UAL after all other changes $[(A4) + (A5) + (A6)]$	1,352,549,503
8. Actual UAL as of 6/30/14	973,226,141
9. Total (Gain)/Loss for 2013/2014 $[(A8) - (A7)]$	\$ (379,323,362)
B Contribution (Gain)/Loss for the Year	
1. Expected Contribution (Employer and Employee)	\$ 205,415,009
2. Interest on Expected Contributions	7,563,805
3. Actual Contributions	208,140,836
4. Interest on Actual Contributions	7,664,176
5. Expected Contributions with Interest $[(B1) + (B2)]$	212,978,814
6. Actual Contributions with Interest $[(B3) + (B4)]$	215,805,012
7. Contribution (Gain)/Loss $[(B5) - (B6)]$	\$ (2,826,198)
C Asset (Gain)/Loss for the Year	
1. Market Value of Assets as of 6/30/13	\$ 3,974,442,195
2. Receivables PY	(16,770,965)
3. Receivables CY	17,597,657
4. Contributions Received	208,140,836
5. Benefits and Refunds Paid	(204,560,806)
6. Transfers and miscellaneous adjustments	5,970,933
7. Expected Int. $[\.075 \times (C1 + C2) + ((1.075)^{\frac{1}{2}} - 1) \times ((C4) + (C5) + (C6))]$	297,177,028
8. Expected Assets as of 6/30/14 $[(C1) + (C2) + (C3) + (C4) + (C5) + (C6) + (C7)]$	4,281,996,878
9. Market Value of Assets as of 6/30/14	4,682,894,962
10. Asset (Gain)/Loss $[(C8) - (C9)]$	\$ (400,898,084)
D Liability (Gain)/Loss for the Year	
1. Total (Gain)/Loss (A9)	\$ (379,323,362)
2. Contribution (Gain)/Loss (B7)	(2,826,198)
3. Asset (Gain)/Loss (C10)	(400,898,084)
4. Liability (Gain)/Loss $[(D1) - (D2) - (D3)]$	\$ 24,400,920

Schedule of Amortization Bases

There is a two-year lag between the Valuation Date and the Contribution Fiscal Year.

- The assets, liabilities and funded status of the plan are measured as of the valuation date; June 30, 2014.
- The employer contribution rate determined by the valuation is for the fiscal year beginning two years after the valuation date; Fiscal Year 2016-17.

This two-year lag is necessary due to the amount of time needed to extract and test the membership and financial data, and due to the need to provide public agencies with their employer contribution rates well in advance of the start of the fiscal year.

The Unfunded Liability is used to determine the employer contribution and therefore must be rolled forward two years from the valuation date to the first day of the fiscal year for which the contribution is being determined. The Unfunded Liability is rolled forward each year by subtracting the expected Payment on the Unfunded Liability for the fiscal year and adjusting for interest. The Expected Payment on the Unfunded Liability for a fiscal year is equal to the Expected Employer Contribution for the fiscal year minus the Expected Normal Cost for the year. The Employer Contribution Rate for the first fiscal year is determined by the actuarial valuation two years ago and the rate for the second year is from the actuarial valuation one year ago. The Normal Cost Rate for each of the two fiscal years is assumed to be the same as the rate determined by the current valuation. All expected dollar amounts are determined by multiplying the rate by the expected payroll for the applicable fiscal year, based on payroll as of the valuation date.

Reason for Base	Date Established	Amortization Period	Amounts for Fiscal 2016-17						
			Balance 6/30/14	Expected Payment 2014-15	Balance 6/30/15	Expected Payment 2015-16	Balance 6/30/16	Scheduled Payment for 2016-17	Payment as Percentage of Payroll
FS 30-YEAR AMORTIZATION	06/30/08	24	\$(10,139,897)	\$(655,837)	\$(10,220,403)	\$(675,512)	\$(10,286,548)	\$(695,777)	(0.071%)
GOLDEN HANDSHAKE	06/30/09	15	\$33,202,082	\$2,789,348	\$32,800,182	\$2,873,028	\$32,281,376	\$2,959,219	0.302%
ASSUMPTION CHANGE	06/30/09	15	\$84,643,809	\$7,111,030	\$83,619,222	\$7,324,361	\$82,296,605	\$7,544,092	0.769%
SPECIAL (GAIN)/LOSS	06/30/09	25	\$115,228,835	\$7,302,999	\$116,299,087	\$7,522,089	\$117,222,451	\$7,747,752	0.790%
GOLDEN HANDSHAKE	06/30/10	16	\$1,169,186	\$94,523	\$1,158,872	\$97,358	\$1,144,844	\$100,279	0.010%
SPECIAL (GAIN)/LOSS	06/30/10	26	\$80,815,598	\$5,025,130	\$81,666,602	\$5,175,884	\$82,425,126	\$5,331,161	0.544%
GOLDEN HANDSHAKE	06/30/11	17	\$32,550,734	\$2,539,835	\$32,358,682	\$2,616,030	\$32,073,225	\$2,694,511	0.275%
ASSUMPTION CHANGE	06/30/11	17	\$101,887,428	\$7,949,967	\$101,286,284	\$8,188,466	\$100,392,773	\$8,434,120	0.860%
SPECIAL (GAIN)/LOSS	06/30/11	27	\$(44,483,005)	\$(2,716,758)	\$(45,002,436)	\$(2,798,261)	\$(45,476,320)	\$(2,882,208)	(0.294%)
PAYMENT (GAIN)/LOSS	06/30/12	28	\$(67,744,995)	\$(4,068,123)	\$(68,607,950)	\$(4,190,166)	\$(69,409,090)	\$(4,315,871)	(0.440%)
(GAIN)/LOSS	06/30/12	28	\$214,559,837	\$12,884,431	\$217,292,962	\$13,270,964	\$219,830,305	\$13,669,093	1.394%
(GAIN)/LOSS	06/30/13	29	\$522,043,672	\$56,769	\$561,138,088	\$7,892,427	\$595,040,402	\$16,258,399	1.658%
ASSUMPTION CHANGE	06/30/14	20	\$288,816,218	\$(6,073,518)	\$316,774,592	\$(6,255,723)	\$347,018,758	\$6,609,905	0.674%
(GAIN)/LOSS	06/30/14	30	\$(379,323,361)	\$4,811,435	\$(412,761,215)	\$5,091,443	\$(448,997,227)	\$(6,315,162)	(0.644%)
TOTAL			\$973,226,141	\$37,051,231	\$1,007,802,569	\$46,132,388	\$1,035,556,680	\$57,139,513	5.826%

Alternate Amortization Schedules

The amortization schedule shown on the previous page shows the minimum contribution required according to CalPERS amortization policy. There has been considerable interest from many agencies in paying off these unfunded accrued liabilities sooner and the possible savings in doing so. Therefore, we have provided alternate amortization schedules to help analyze your current amortization schedule and illustrate the advantages of accelerating payments towards your plan's unfunded liability of \$1,035,556,680 as of June 30, 2016, which under the minimum schedule, will require total payments of \$2,210,124,106. Shown below are the level rate payments required to amortize your plan's unfunded liability assuming a fresh start over the various periods noted. Note that the payments under each scenario would increase by 3 percent for each year into the future.

Period	Level Rate of Payroll Amortization				
	2016-17 Rate	2016-17 Payment	Total Payments	Total Interest	Difference from Current Schedule
20	7.973%	\$78,190,150	\$2,100,998,617	\$1,065,441,937	\$109,125,489
15	9.679%	\$94,929,000	\$1,765,576,290	\$730,019,610	\$444,547,816

If you are interested in changing your plan's amortization schedule please contact your plan actuary to discuss further.

Reconciliation of Required Employer Contributions

	Percentage of Projected Payroll	Estimated \$ Based on Projected Payroll
1. Contribution for 7/1/15 – 6/30/16	15.429%	\$ 144,418,374
2. Effect of changes since the prior year annual valuation		
a) Effect of changes in demographics and financial results	(0.284%)	(2,782,525)
b) Effect of plan changes	0.000%	0
c) Effect of changes in Assumptions	1.331%	13,053,514
d) Effect of change in payroll	-	6,897,876
e) Effect of elimination of amortization base	0.000%	0
f) Effect of changes due to Fresh Start	0.000%	0
g) Net effect of the changes above [Sum of (a) through (f)]	1.047%	17,168,865
3. Contribution for 7/1/16 – 6/30/17 [(1)+(2g)]	16.476%	161,587,239

The contribution actually paid (item 1) may be different if a prepayment of unfunded actuarial liability is made or a plan change became effective after the prior year's actuarial valuation was performed.

Employer Contribution Rate History

The table below provides a recent history of the employer contribution rates for your plan, as determined by the annual actuarial valuation. It does not account for prepayments or benefit changes made in the middle of the year.

Required By Valuation

Fiscal Year	Employer Normal Cost	Unfunded Rate	Total Employer Contribution Rate
2011 - 2012	10.370%	2.742%	13.112%
2012 - 2013	10.227%	3.267%	13.494%
2013 - 2014	11.099%	3.902%	15.001%
2014 - 2015	10.341%	4.186%	14.527%
2015 - 2016	10.376%	5.053%	15.429%
2016 - 2017	10.650%	5.826%	16.476%

Funding History

The Funding History below shows the recent history of the actuarial accrued liability, the market value of assets, the funded ratio and the annual covered payroll.

Valuation Date	Accrued Liability	Market Value of Assets (MVA)	Unfunded Liability	Funded Ratio	Annual Covered Payroll
06/30/09	\$ 3,790,232,824	\$ 2,482,332,809	\$ 1,307,900,015	65.5%	\$ 841,103,683
06/30/10	4,097,191,707	2,882,444,152	1,214,747,555	70.4%	854,932,117
06/30/11	4,461,553,672	3,525,640,733	935,912,939	79.0%	812,362,628
06/30/12	4,708,881,750	3,520,189,846	1,188,691,904	74.8%	836,418,298
06/30/13	5,008,806,968	3,974,442,195	1,034,364,773	79.3%	856,593,282
06/30/14	5,656,121,103	4,682,894,962	973,226,141	82.8%	897,506,714

RISK ANALYSIS

- **VOLATILITY RATIOS**
- **PROJECTED RATES**
- **ANALYSIS OF FUTURE INVESTMENT RETURN SCENARIOS**
- **ANALYSIS OF DISCOUNT RATE SENSITIVITY**
- **HYPOTHETICAL TERMINATION LIABILITY**

Volatility Ratios

The actuarial calculations supplied in this communication are based on a number of assumptions about very long-term demographic and economic behavior. Unless these assumptions (terminations, deaths, disabilities, retirements, salary growth, and investment return) are exactly realized each year, there will be differences on a year-to-year basis. The year-to-year differences between actual experience and the assumptions are called actuarial gains and losses and serve to lower or raise the employer's rates from one year to the next. Therefore, the rates will inevitably fluctuate, especially due to the ups and downs of investment returns.

Asset Volatility Ratio (AVR)

Plans that have higher asset to payroll ratios produce more volatile employer rates due to investment return. For example, a plan with an asset to payroll ratio of 8 may experience twice the contribution volatility due to investment return volatility, than a plan with an asset to payroll ratio of 4. Below we have shown your asset volatility ratio, a measure of the plan's current rate volatility. It should be noted that this ratio is a measure of the current situation. It increases over time but generally tends to stabilize as the plan matures.

Liability Volatility Ratio (LVR)

Plans that have higher liability to payroll ratios produce more volatile employer rates due to investment return and changes in liability. For example, a plan with a liability to payroll ratio of 8 is expected to have twice the contribution volatility of a plan with a liability to payroll ratio of 4. The liability volatility ratio is also included in the table below. It should be noted that this ratio indicates a longer-term potential for contribution volatility and the asset volatility ratio, described above, will tend to move closer to this ratio as the plan matures.

Rate Volatility	As of June 30, 2014	
1. Market Value of Assets without Receivables	\$	4,665,297,305
2. Payroll		897,506,714
3. Asset Volatility Ratio (AVR = 1. / 2.)		5.2
4. Accrued Liability	\$	5,656,121,103
5. Liability Volatility Ratio (LVR = 4. / 2.)		6.3

Projected Rates

The estimated rate for 2017-18 is based on a projection of the most recent information we have available, including an estimated 2.4 percent investment return for Fiscal Year 2014-15.

The table below shows projected employer contribution rates (before cost sharing) for the next five fiscal years, assuming CalPERS earns 2.4 percent for Fiscal Year 2014-15 and 7.50 percent every fiscal year thereafter, and assuming that all other actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur during the projection period. The projected contribution rates do not reflect that the plan's normal cost will decline over time as new employees are hired into PEPRA and other lower cost benefit tiers.

	Required Rate	Projected Future Employer Contribution Rates				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Contribution Rates:	16.476%	17.7%	19.0%	20.2%	20.6%	21.0%

Analysis of Future Investment Return Scenarios

In 2014 CalPERS completed a 2-year asset liability management study incorporating actuarial assumptions and strategic asset allocation. On February 19, 2014 the CalPERS Board of Administration adopted relatively modest changes to the current asset allocation that will reduce the expected volatility of returns. The adopted asset allocation is expected to have a long-term blended return that continues to support a discount rate assumption of 7.5 percent. The newly adopted asset allocation has a lower expected investment volatility which will result in better risk characteristics than an equivalent margin for adverse deviation. The previous asset allocation had an expected standard deviation of 12.45 percent while the current asset allocation has a lower expected standard deviation of 11.76 percent.

The investment return for Fiscal Year 2014-15 was announced July 13, 2015. The investment return in Fiscal Year 2014-15 is 2.4 percent before administrative expenses. This year, there will be no adjustment for real estate and private equities. For purposes of projecting future employer rates, we are assuming a 2.4 percent investment return for Fiscal Year 2014-15.

The investment return realized during a fiscal year first affects the contribution rate for the fiscal year two years later. Specifically, the investment return for 2014-15 will first be reflected in the June 30, 2015 actuarial valuation that will be used to set the 2017-18 employer contribution rates. The 2015-16 investment return will first be reflected in the June 30, 2016 actuarial valuation that will be used to set the 2018-19 employer contribution rates and so forth.

Based on a 2.4 percent investment return for Fiscal Year 2014-15, the April 17, 2013 CalPERS Board-approved amortization and rate smoothing method change, the February 18, 2014 new demographic assumptions including 20-year mortality improvement using Scale BB and assuming that all other actuarial assumptions will be realized, and that no further changes to assumptions, contributions, benefits, or funding will occur between now and the beginning of the Fiscal Year 2017-18, the effect on the 2017-18 Employer Rate is as follows:

Estimated 2017-18 Employer Rate

17.7%

**Estimated Increase in Employer Rate between
2016-17 and 2017-18**

1.2%

As part of this report, a sensitivity analysis was performed to determine the effects of various investment returns during fiscal years 2015-16, 2016-17 and 2017-18 on the 2018-19, 2019-20 and 2020-21 employer rates. Once again, the projected rate increases assume that all other actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur.

Five different investment return scenarios were selected.

- The first scenario is what one would expect if the markets were to give us a 5th percentile return from July 1, 2015 through June 30, 2018. The 5th percentile return corresponds to a -3.8 percent return for each of the 2015-16, 2016-17 and 2017-18 fiscal years.
- The second scenario is what one would expect if the markets were to give us a 25th percentile return from July 1, 2015 through June 30, 2018. The 25th percentile return corresponds to a 2.8 percent return for each of the 2015-16, 2016-17 and 2017-18 fiscal years.
- The third scenario assumed the return for 2015-16, 2016-17, 2017-18 would be our assumed 7.5 percent investment return which represents about a 49th percentile event.
- The fourth scenario is what one would expect if the markets were to give us a 75th percentile return from July 1, 2015 through June 30, 2018. The 75th percentile return corresponds to a 12.0 percent return for each of the 2015-16, 2016-17 and 2017-18 fiscal years.
- Finally, the last scenario is what one would expect if the markets were to give us a 95th percentile return from July 1, 2015 through June 30, 2018. The 95th percentile return corresponds to a 18.9 percent return for each of the 2015-16, 2016-17 and 2017-18 fiscal years.

The table below shows the estimated projected contribution rates and the estimated increases for your plan under the five different scenarios.

2015-18 Investment Return Scenario	Estimated Employer Rate			Estimated Change in Employer Rate between 2017-18 and 2020-21
	2018-19	2019-20	2020-21	
(3.8%) (5th percentile)	19.8%	22.7%	25.5%	7.7%
2.8% (25th percentile)	19.3%	21.3%	22.7%	5.0%
7.5%	19.0%	20.2%	20.6%	2.9%
12.0%(75th percentile)	18.6%	19.2%	18.5%	0.8%
18.9%(95th percentile)	18.1%	10.7%	10.7%	(7.1%)

Analysis of Discount Rate Sensitivity

The following analysis looks at the 2016-17 total normal cost rates and liabilities under two different discount rate scenarios. Shown below are the total normal cost rates assuming discount rates that are 1 percent lower and 1 percent higher than the current valuation discount rate. This analysis gives an indication of the potential plan impacts if the PERF were to realize investment returns of 6.50 percent or 8.50 percent over the long-term.

This type of analysis gives the reader a sense of the long-term risk to the contribution rates.

Sensitivity Analysis			
As of June 30, 2014	6.50% Discount Rate (-1%)	7.50% Discount Rate (assumed rate)	8.50% Discount Rate (+1%)
Total Normal Cost	22.972%	18.285%	14.744%
Accrued Liability	\$6,482,237,529	\$5,656,121,103	\$4,979,273,242
Unfunded Accrued Liability	\$1,799,342,567	\$973,226,141	\$296,378,280

Hypothetical Termination Liability

The hypothetical termination liability is an estimate of the financial position of your plan if you had terminated your contract with CalPERS as of June 30, 2014. Your plan liability on a termination basis is calculated differently compared to the plan's ongoing funding liability. For this hypothetical termination liability calculation both compensation and service are frozen as of the valuation date and no future pay increases or service accruals are included.

For the Terminated Agency Pool the CalPERS Board adopted a more conservative investment policy and asset allocation strategy. Since the Terminated Agency Pool has limited funding sources due to the fact that no future employer contributions will be made, expected benefit payments are secured by risk-free assets. With this change, CalPERS increased benefit security for members while limiting its funding risk. However, this asset allocation has a lower expected rate of return than the PERF. Consequently, the lower discount rate for the Terminated Agency pool results in higher liabilities for terminated plans.

The effective termination discount rate will depend on actual market rates of return for risk-free securities on the date of termination. As market discount rates are variable the table below shows a range for the hypothetical termination liability based on the lowest and highest interest rates observed during the period from July 1, 2013 through June 30, 2015.

Valuation Date	Market Value of Assets (MVA)	Hypothetical Termination Liability ^{1,2} @ 2.00%	Unfunded Termination Liability @ 2.00%	Hypothetical Termination Liability ^{1,2} @ 3.75%	Unfunded Termination Liability @ 3.75%
06/30/14	\$ 4,682,894,962	\$ 11,287,922,458	\$ 6,605,027,496	\$ 8,466,576,906	\$ 3,783,681,944

¹ The hypothetical liabilities calculated above include a 7 percent mortality contingency load in accordance with Board policy. Other actuarial assumptions, such as wage and inflation assumptions, can be found in Appendix A.

² The current discount rate assumption used for termination valuations is a weighted average of the 10-year and 30-year U.S. Treasury yields where the weights are based on matching asset and liability durations as of the termination date. The discount rates used in the table are based on 20-year Treasury bonds, rounded to the nearest quarter percentage point, which is a good proxy for most plans. The 20-year Treasury yield was 3.00% on June 30, 2014.

In order to terminate your plan, you must first contact our Retirement Services Contract Unit to initiate a Resolution of Intent to Terminate. The completed Resolution will allow your plan actuary to give you a preliminary termination valuation with a more up-to-date estimate of your plan liabilities. CalPERS strongly advises you to consult with your plan actuary before beginning this process.

Plan's Major Benefit Options

Shown below is a summary of the major optional benefits for which your agency has contracted. A description of principal standard and optional plan provisions is in the following section of this Appendix.

Benefit Provision	Contract Package						
	Active Misc	Active Misc	Active Misc	Active Misc	Active Misc	Active Misc	Inactive Misc
Benefit Formula Social Security Coverage Fully/Modified	3.0% @ 60 Yes Modified	3.0% @ 60 Yes Modified	3.0% @ 60 Yes Modified	2.0% @ 60 Yes Modified	2.0% @ 62 Yes Full	2.0% @ 60 Yes Modified	2.0% @ 55 Yes Modified
Employee Contribution Rate	8.00%	8.00%	8.00%	7.00%	6.50%	8.00%	8.00%
Final Average Compensation Period	One Year	One Year	One Year	Three Year	Three Year	One Year	One Year
Sick Leave Credit	No	No	No	No	No	No	No
Non-Industrial Disability	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Industrial Disability	No	No	No	No	No	No	No
Pre-Retirement Death Benefits Optional Settlement 2W 1959 Survivor Benefit Level Special Alternate (firefighters)	No No No No No	No No No No No	No No No No No	No No No No No	No No No No No	No No No No No	No No No No No
Post-Retirement Death Benefits Lump Sum Survivor Allowance (PRSA)	\$500 Yes	\$500 Yes	\$500 Yes	\$500 Yes	\$500 Yes	\$500 Yes	\$500 Yes
COLA	2%	2%	2%	2%	2%	2%	2%

Plan's Major Benefit Options

Shown below is a summary of the major optional benefits for which your agency has contracted. A description of principal standard and optional plan provisions is in the following section of this Appendix.

Benefit Provision	Contract Package					
	Receiving Misc	Inactive Misc	Inactive Misc	Inactive Misc	Inactive Misc	Receiving Misc
Benefit Formula Social Security Coverage Full/Modified		2.0% @ 55 Yes Modified	3.0% @ 60 No Full	2.0% @ 55 Yes Modified	3.0% @ 60 No Full	
Employee Contribution Rate		One Year	One Year	One Year	One Year	
Final Average Compensation Period		No	No	No	No	
Sick Leave Credit		Standard	Standard	Standard	Standard	
Non-Industrial Disability		No	No	No	No	
Industrial Disability		No	No	No	No	
Pre-Retirement Death Benefits Optional Settlement 2W		No	No	No	No	
1959 Survivor Benefit Level Special		No	Indexed	No	Indexed	
Alternate (firefighters)		No	No	No	No	
Post-Retirement Death Benefits Lump Sum	\$500 Yes	\$500 Yes	\$500 Yes	\$500 Yes	\$500 Yes	\$500 Yes
Survivor Allowance (PRSA)	2%	2%	2%	2%	2%	2%
COLA						

APPENDICES

- **APPENDIX A – ACTUARIAL METHODS AND ASSUMPTIONS**
- **APPENDIX B – PRINCIPAL PLAN PROVISIONS**
- **APPENDIX C – PARTICIPANT DATA**
- **APPENDIX D – DEVELOPMENT OF PEPRA MEMBER CONTRIBUTION RATES**
- **APPENDIX E – GLOSSARY OF ACTUARIAL TERMS**

APPENDIX A

ACTUARIAL METHODS AND ASSUMPTIONS

- **ACTUARIAL DATA**
- **ACTUARIAL METHODS**
- **ACTUARIAL ASSUMPTIONS**
- **MISCELLANEOUS**

Actuarial Data

As stated in the Actuarial Certification, the data, which serves as the basis of this valuation, has been obtained from the various CalPERS databases. We have reviewed the valuation data and believe that it is reasonable and appropriate in aggregate. We are unaware of any potential data issues that would have a material effect on the results of this valuation, except that data does not always contain the latest salary information for former members now in reciprocal systems and does not recognize the potential for unusually large salary deviation in certain cases such as elected officials. Therefore, salary information in these cases may not be accurate. These situations are relatively infrequent, however, and when they do occur, they generally do not have a material impact on the employer contribution rates.

Actuarial Methods

Funding Method

The actuarial funding method used for the Retirement Program is the Entry Age Normal Cost Method. Under this method, projected benefits are determined for all members and the associated liabilities are spread in a manner that produces level annual cost as a percent of pay in each year from the age of hire (entry age) to the assumed retirement age. The cost allocated to the current fiscal year is called the normal cost.

The actuarial accrued liability for active members is then calculated as the portion of the total cost of the plan allocated to prior years. The actuarial accrued liability for members currently receiving benefits, for active members beyond the assumed retirement age, and for members entitled to deferred benefits, is equal to the present value of the benefits expected to be paid. No normal costs are applicable for these participants.

The excess of the total actuarial accrued liability over the market value of plan assets is called the unfunded actuarial accrued liability (UAL). Funding requirements are determined by adding the normal cost and an amortization of the unfunded liability as a level percentage of assumed future payrolls. Commencing with the June 30, 2013 valuation all new gains or losses are tracked and amortized over a fixed 30-year period with a 5 year ramp up at the beginning and a 5 year ramp down at the end of the amortization period. All changes in liability due to plan amendments (other than golden handshakes), changes in actuarial assumptions, or changes in actuarial methodology are amortized separately over a 20-year period with a 5 year ramp up at the beginning and a 5 year ramp down at the end of the amortization period. Changes in unfunded accrued liability due to a Golden Handshake will be amortized over a period of 5 years.

Additional contributions will be required for any plan or pool if their cash flows hamper adequate funding progress by preventing the expected funded status on a market value of assets basis to either:

- Increase by at least 15 percent by June 30, 2043; or
- Reach a level of 75 percent funded by June 30, 2043

The necessary additional contribution will be obtained by changing the amortization period of the gains and losses, except for those occurring in the fiscal years 2008-2009, 2009-2010, and 2010-2011 to a period, which will result in the satisfaction of the above criteria. CalPERS actuaries will reassess the criteria above when performing each future valuation to determine whether or not additional contributions are necessary.

An exception to the funding rules above is used whenever the application of such rules results in inconsistencies. In these cases, a "fresh start" approach is used. This simply means that the current unfunded actuarial liability is projected and amortized over a set number of years. However, in the case of a 30-year fresh start, just the unfunded liability not already in the (gain)/loss base (which is already amortized over 30 years), will go into the new fresh start base. In addition, a fresh start is needed in the following situations:

- 1) When a positive payment would be required on a negative unfunded actuarial liability (or conversely a negative payment on a positive unfunded actuarial liability); or

- 2) When there are excess assets, rather than an unfunded liability. In this situation, a 30-year fresh start is used, unless a longer fresh start is needed to avoid a negative total rate.

It should be noted that the actuary may choose to use a fresh start under other circumstances. In all cases, the fresh start period is set by the actuary at what is deemed appropriate; however, the period will not be greater than 30 years.

Asset Valuation Method

It is the policy of the CalPERS Board of Administration to use professionally accepted amortization methods to eliminate unfunded accrued liabilities or surpluses in a manner that maintains benefit security for the members of the System while minimizing substantial variations in employer contribution rates. On April 17, 2013, the CalPERS Board of Administration approved a recommendation to change the CalPERS amortization and rate smoothing policies. Beginning with the June 30, 2013 valuations that set the 2015-16 rates, CalPERS employs an amortization and smoothing policy that pays for all gains and losses over a fixed 30-year period with the increases or decreases in the rate spread directly over a 5-year period. CalPERS no longer uses an actuarial value of assets and only uses the market value of assets. This direct rate smoothing method is equivalent to a method using a 5 year asset smoothing period with no actuarial value of asset corridor and a 25-year amortization period for gains and losses.

PEPRA Normal Cost Rate Methodology

Per Government Code Section 7522.30(b) the "normal cost rate" shall mean the annual actuarially determined normal cost for the plan of retirement benefits provided to the new member and shall be established based on actuarial assumptions used to determine the liabilities and costs as part of the annual actuarial valuation. The plan of retirement benefits shall include any elements that would impact the actuarial determination of the normal cost, including, but not limited to, the retirement formula, eligibility and vesting criteria, ancillary benefit provisions, and any automatic cost-of-living adjustments as determined by the public retirement system.

Each non-pooled plan is considered to be stable with a sufficiently large demographic of actives. It is preferable to determine normal cost using a large active population ongoing so that this rate remains relatively stable. The total PEPRA normal cost will be calculated using all active members within a non-pooled plan. Accordingly plans will be funded equally between employer and employee based on the demographics of the employees of that employer. As each non-pooled plan builds up to either 100+ active PEPRA members or half of their active population is under the PEPRA formula, the total PEPRA normal cost will be based on the active PEPRA population in the plan.

Actuarial Assumptions

In 2014 CalPERS completed a 2-year asset liability management study incorporating actuarial assumptions and strategic asset allocation. On February 19, 2014 the CalPERS Board of Administration adopted relatively modest changes to the current asset allocation that will reduce the expected volatility of returns. The adopted asset allocation is expected to have a long-term blended return that continues to support a discount rate assumption of 7.5 percent. The Board also approved several changes to the demographic assumptions that more closely align with actual experience. The most significant of these is mortality improvement to acknowledge the greater life expectancies we are seeing in our membership and expected continued improvements. The new actuarial assumptions are used in this valuation to set the Fiscal Year 2016-17 contribution rates for public agency employers. The increase in liability due to new actuarial assumptions is amortized over a 20-year period with a 5-year ramp-up/ramp-down in accordance with Board policy. These new actuarial assumptions are set forth below. For more details, please refer to the experience study report that can be found on the CalPERS website under: Forms and Publications Center; Employers Section. Click on View employer publications; Actuarial Reports and scroll down to CalPERS Experience Study.

Economic Assumptions

Discount Rate

7.5 percent compounded annually (net of expenses). This assumption is used for all plans.

Termination Liability Discount Rate

The current discount rate assumption used for termination valuations is a weighted average of the 10-year and 30-year U.S. Treasury yields where the weights are based on matching asset and liability durations as of the termination date.

Previously, for purposes of the hypothetical termination liability estimate, the discount rate used was the yield on the 30-year US Treasury Separate Trading of Registered Interest and Principal of Securities (STRIPS). However, this point in time estimate for the termination discount rate can be significantly different from the calculated discount rate for a plan termination based on prevailing market rates. Rather than using a point estimate the hypothetical termination liabilities in this report are calculated using an observed range of market interest rates. This range is based on the 20-year Treasury bond which has a similar duration to most plan liabilities and serves as a good proxy for the termination discount rate.

The securities purchased for the Terminated Agency Pool (TAP), however, consist solely of STRIPS, TIPS, and cash with varying maturity dates over the next 30 years. As a result, the methodology to set the discount rate for the TAP needs to be modified to ensure the discount rate is consistent with the yield rate of the portfolio. Beginning with the June 30, 2014 valuation the discount rate will be calculated by using a weighted average of the yields of the securities effective in the portfolio as of the last day of the most recent month of termination. This methodology would result in a discount rate that more closely reflects the yield rate of the TAP. As of June 30, 2014 this discount rate is 2.91 percent as opposed to the yield on the 30-year Strip of 3.55 percent.

Furthermore, when a plan with a large liability terminates a contingency immunization calculation is performed using actual cash flows of the terminating agency. Large liability terminations are expected to have large annual cash flows that may have an impact on the TAP's cash flows thus creating a need to rebalance the portfolio. Pricing the actual cash flows at current market rates would have the same effect as a rebalance. A large liability plan is defined as one that would cause a 50 percent reduction of the existing TAP surplus as of the latest annual valuation. Quotes would be retrieved from securities necessary to immunize the additional liability. The termination discount rate is determined using the methodology above with the calculation being based on the yields of the quoted securities as opposed to the entire TAP portfolio.

Salary Growth

Annual increases vary by category, entry age, and duration of service. A sample of assumed increases are shown below.

Public Agency Miscellaneous

<u>Duration of Service</u>	<u>(Entry Age 20)</u>	<u>(Entry Age 30)</u>	<u>(Entry Age 40)</u>
0	0.1220	0.1160	0.1020
1	0.0990	0.0940	0.0830
2	0.0860	0.0810	0.0710
3	0.0770	0.0720	0.0630
4	0.0700	0.0650	0.0570
5	0.0640	0.0600	0.0520
10	0.0460	0.0430	0.0390
15	0.0420	0.0400	0.0360
20	0.0390	0.0380	0.0340
25	0.0370	0.0360	0.0330
30	0.0350	0.0340	0.0320

Public Agency Fire

<u>Duration of Service</u>	<u>(Entry Age 20)</u>	<u>(Entry Age 30)</u>	<u>(Entry Age 40)</u>
0	0.2000	0.1980	0.1680
1	0.1490	0.1460	0.1250
2	0.1200	0.1160	0.0990
3	0.0980	0.0940	0.0810
4	0.0820	0.0780	0.0670
5	0.0690	0.0640	0.0550
10	0.0470	0.0460	0.0420
15	0.0440	0.0420	0.0390
20	0.0420	0.0390	0.0360
25	0.0400	0.0370	0.0340
30	0.0380	0.0360	0.0340

Public Agency Police

<u>Duration of Service</u>	<u>(Entry Age 20)</u>	<u>(Entry Age 30)</u>	<u>(Entry Age 40)</u>
0	0.1500	0.1470	0.1310
1	0.1160	0.1120	0.1010
2	0.0950	0.0920	0.0830
3	0.0810	0.0780	0.0700
4	0.0700	0.0670	0.0600
5	0.0610	0.0580	0.0520
10	0.0450	0.0430	0.0370
15	0.0450	0.0430	0.0370
20	0.0450	0.0430	0.0370
25	0.0450	0.0430	0.0370
30	0.0450	0.0430	0.0370

Salary Growth (continued)

Public Agency County Peace Officers			
<u>Duration of Service</u>	<u>(Entry Age 20)</u>	<u>(Entry Age 30)</u>	<u>(Entry Age 40)</u>
0	0.1770	0.1670	0.1500
1	0.1340	0.1260	0.1140
2	0.1080	0.1030	0.0940
3	0.0900	0.0860	0.0790
4	0.0760	0.0730	0.0670
5	0.0650	0.0620	0.0580
10	0.0470	0.0450	0.0410
15	0.0460	0.0450	0.0390
20	0.0460	0.0450	0.0380
25	0.0460	0.0450	0.0380
30	0.0460	0.0440	0.0380

Schools			
<u>Duration of Service</u>	<u>(Entry Age 20)</u>	<u>(Entry Age 30)</u>	<u>(Entry Age 40)</u>
0	0.0900	0.0880	0.0820
1	0.0780	0.0750	0.0700
2	0.0700	0.0680	0.0630
3	0.0650	0.0630	0.0580
4	0.0610	0.0590	0.0540
5	0.0580	0.0560	0.0510
10	0.0460	0.0450	0.0410
15	0.0420	0.0410	0.0380
20	0.0390	0.0380	0.0350
25	0.0370	0.0350	0.0330
30	0.0350	0.0330	0.0310

- The Miscellaneous salary scale is used for Local Prosecutors.
- The Police salary scale is used for Other Safety, Local Sheriff, and School Police.

Overall Payroll Growth

3.00 percent compounded annually (used in projecting the payroll over which the unfunded liability is amortized). This assumption is used for all plans.

Inflation

2.75 percent compounded annually. This assumption is used for all plans.

Non-valued Potential Additional Liabilities

The potential liability loss for a cost-of-living increase exceeding the 2.75 percent inflation assumption, and any potential liability loss from future member service purchases are not reflected in the valuation.

Miscellaneous Loading Factors

Credit for Unused Sick Leave

Total years of service is increased by 1 percent for those plans that have accepted the provision providing Credit for Unused Sick Leave.

Conversion of Employer Paid Member Contributions (EPMC)

Total years of service is increased by the Employee Contribution Rate for those plans with the provision providing for the Conversion of Employer Paid Member Contributions (EPMC) during the final compensation period.

Norris Decision (Best Factors)

Employees hired prior to July 1, 1982 have projected benefit amounts increased in order to reflect the use of "Best Factors" in the calculation of optional benefit forms. This is due to a 1983 Supreme Court decision, known as the Norris decision, which required males and females to be treated equally in the determination of benefit amounts. Consequently, anyone already employed at that time is given the best possible conversion factor when optional benefits are determined. No loading is necessary for employees hired after July 1, 1982.

Termination Liability

The termination liabilities include a 7 percent contingency load. This load is for unforeseen improvements in mortality.

Demographic Assumptions

Pre-Retirement Mortality

Non-Industrial Death Rates vary by age and gender. Industrial Death rates vary by age. See sample rates in table below. The non-industrial death rates are used for all plans. The industrial death rates are used for Safety Plans (except for Local Prosecutor safety members where the corresponding Miscellaneous Plan does not have the Industrial Death Benefit).

Age	Non-Industrial Death (Not Job-Related)		Industrial Death (Job-Related)
	Male	Female	Male and Female
20	0.00031	0.00020	0.00003
25	0.00040	0.00023	0.00007
30	0.00049	0.00025	0.00010
35	0.00057	0.00035	0.00012
40	0.00075	0.00050	0.00013
45	0.00106	0.00071	0.00014
50	0.00155	0.00100	0.00015
55	0.00228	0.00138	0.00016
60	0.00308	0.00182	0.00017
65	0.00400	0.00257	0.00018
70	0.00524	0.00367	0.00019
75	0.00713	0.00526	0.00020
80	0.00990	0.00814	0.00021

Miscellaneous Plans usually have Industrial Death rates set to zero unless the agency has specifically contracted for Industrial Death benefits. If so, each Non-Industrial Death rate shown above will be split into two components; 99 percent will become the Non-Industrial Death rate and 1 percent will become the Industrial Death rate.

Post-Retirement Mortality

Rates vary by age, type of retirement and gender. See sample rates in table below. These rates are used for all plans.

Age	Healthy Recipients		Non-Industrially Disabled (Not Job-Related)		Industrially Disabled (Job-Related)	
	Male	Female	Male	Female	Male	Female
50	0.00501	0.00466	0.01680	0.01158	0.00501	0.00466
55	0.00599	0.00416	0.01973	0.01149	0.00599	0.00416
60	0.00710	0.00436	0.02289	0.01235	0.00754	0.00518
65	0.00829	0.00588	0.02451	0.01607	0.01122	0.00838
70	0.01305	0.00993	0.02875	0.02211	0.01635	0.01395
75	0.02205	0.01722	0.03990	0.03037	0.02834	0.02319
80	0.03899	0.02902	0.06083	0.04725	0.04899	0.03910
85	0.06969	0.05243	0.09731	0.07762	0.07679	0.06251
90	0.12974	0.09887	0.14804	0.12890	0.12974	0.09887
95	0.22444	0.18489	0.22444	0.21746	0.22444	0.18489
100	0.32536	0.30017	0.32536	0.30017	0.32536	0.30017
105	0.58527	0.56093	0.58527	0.56093	0.58527	0.56093
110	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

The post-retirement mortality rates above include 20 years of projected on-going mortality improvement using Scale BB published by the Society of Actuaries.

Marital Status

For active members, a percentage who are married upon retirement is assumed according to member category as shown in the following table.

Member Category	Percent Married
Miscellaneous Member	85%
Local Police	90%
Local Fire	90%
Other Local Safety	90%
School Police	90%

Age of Spouse

It is assumed that female spouses are 3 years younger than male spouses. This assumption is used for all plans.

Terminated Members

It is assumed that terminated members refund immediately if non-vested. Terminated members who are vested are assumed to follow the same service retirement pattern as active members but with a load to reflect the expected higher rates of retirement, especially at lower ages. The following table shows the load factors that are applied to the service retirement assumption for active members to obtain the service retirement pattern for separated vested members:

Age	Load Factor Miscellaneous	Load Factor Safety
50	190%	310%
51	110%	190%
52	110%	105%
53 through 54	100%	105%
55	100%	140%
56 and above	100% (no change)	100% (no change)

Termination with Refund

Rates vary by entry age and service for Miscellaneous Plans. Rates vary by service for Safety Plans.
 See sample rates in tables below.

Public Agency Miscellaneous						
Duration of Service	Entry Age 20	Entry Age 25	Entry Age 30	Entry Age 35	Entry Age 40	Entry Age 45
0	0.1742	0.1674	0.1606	0.1537	0.1468	0.1400
1	0.1545	0.1477	0.1409	0.1339	0.1271	0.1203
2	0.1348	0.1280	0.1212	0.1142	0.1074	0.1006
3	0.1151	0.1083	0.1015	0.0945	0.0877	0.0809
4	0.0954	0.0886	0.0818	0.0748	0.0680	0.0612
5	0.0212	0.0193	0.0174	0.0155	0.0136	0.0116
10	0.0138	0.0121	0.0104	0.0088	0.0071	0.0055
15	0.0060	0.0051	0.0042	0.0032	0.0023	0.0014
20	0.0037	0.0029	0.0021	0.0013	0.0005	0.0001
25	0.0017	0.0011	0.0005	0.0001	0.0001	0.0001
30	0.0005	0.0001	0.0001	0.0001	0.0001	0.0001
35	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Public Agency Safety			
Duration of Service	Fire	Police	County Peace Officer
0	0.0710	0.1013	0.0997
1	0.0554	0.0636	0.0782
2	0.0398	0.0271	0.0566
3	0.0242	0.0258	0.0437
4	0.0218	0.0245	0.0414
5	0.0029	0.0086	0.0145
10	0.0009	0.0053	0.0089
15	0.0006	0.0027	0.0045
20	0.0005	0.0017	0.0020
25	0.0003	0.0012	0.0009
30	0.0003	0.0009	0.0006
35	0.0003	0.0009	0.0006

The Police Termination and Refund rates are also used for Public Agency Local Prosecutors, Other Safety, Local Sheriff and School Police.

Schools						
Duration of Service	Entry Age 20	Entry Age 25	Entry Age 30	Entry Age 35	Entry Age 40	Entry Age 45
0	0.1730	0.1627	0.1525	0.1422	0.1319	0.1217
1	0.1585	0.1482	0.1379	0.1277	0.1174	0.1071
2	0.1440	0.1336	0.1234	0.1131	0.1028	0.0926
3	0.1295	0.1192	0.1089	0.0987	0.0884	0.0781
4	0.1149	0.1046	0.0944	0.0841	0.0738	0.0636
5	0.0278	0.0249	0.0221	0.0192	0.0164	0.0135
10	0.0172	0.0147	0.0122	0.0098	0.0074	0.0049
15	0.0115	0.0094	0.0074	0.0053	0.0032	0.0011
20	0.0073	0.0055	0.0038	0.0020	0.0002	0.0002
25	0.0037	0.0023	0.0010	0.0002	0.0002	0.0002

30	0.0015	0.0003	0.0002	0.0002	0.0002	0.0002
35	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002

Termination with Vested Benefits

Rates vary by entry age and service for Miscellaneous Plans. Rates vary by service for Safety Plans. See sample rates in tables below.

Public Agency Miscellaneous

Duration of Service	Entry Age 20	Entry Age 25	Entry Age 30	Entry Age 35	Entry Age 40
5	0.0656	0.0597	0.0537	0.0477	0.0418
10	0.0530	0.0466	0.0403	0.0339	0.0000
15	0.0443	0.0373	0.0305	0.0000	0.0000
20	0.0333	0.0261	0.0000	0.0000	0.0000
25	0.0212	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000

Public Agency Safety

Duration of Service	Fire	Police	County Peace Officer
5	0.0162	0.0163	0.0265
10	0.0061	0.0126	0.0204
15	0.0058	0.0082	0.0130
20	0.0053	0.0065	0.0074
25	0.0047	0.0058	0.0043
30	0.0045	0.0056	0.0030
35	0.0000	0.0000	0.0000

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.
- The Police Termination with vested benefits rates are also used for Public Agency Local Prosecutors, Other Safety, Local Sheriff and School Police.

Schools

Duration of Service	Entry Age 20	Entry Age 25	Entry Age 30	Entry Age 35	Entry Age 40
5	0.0816	0.0733	0.0649	0.0566	0.0482
10	0.0629	0.0540	0.0450	0.0359	0.0000
15	0.0537	0.0440	0.0344	0.0000	0.0000
20	0.0420	0.0317	0.0000	0.0000	0.0000
25	0.0291	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000

Non-Industrial (Not Job-Related) Disability

Rates vary by age and gender for Miscellaneous Plans. Rates vary by age and category for Safety Plans.

Age	Miscellaneous		Fire	Police	County Peace Officer	Schools	
	Male	Female	Male and Female	Male and Female	Male and Female	Male	Female
20	0.0002	0.0001	0.0001	0.0001	0.0001	0.0003	0.0003
25	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
30	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0002
35	0.0005	0.0008	0.0001	0.0003	0.0004	0.0005	0.0004
40	0.0012	0.0016	0.0001	0.0004	0.0007	0.0015	0.0010
45	0.0019	0.0022	0.0002	0.0005	0.0013	0.0030	0.0019
50	0.0021	0.0023	0.0005	0.0008	0.0018	0.0039	0.0024
55	0.0022	0.0018	0.0010	0.0013	0.0010	0.0036	0.0021
60	0.0022	0.0014	0.0015	0.0020	0.0006	0.0031	0.0014

- The Miscellaneous Non-Industrial Disability rates are used for Local Prosecutors.
- The Police Non-Industrial Disability rates are also used for Other Safety, Local Sheriff and School Police.

Industrial (Job-Related) Disability

Rates vary by age and category.

Age	Fire	Police	County Peace Officer
20	0.0001	0.0000	0.0004
25	0.0003	0.0017	0.0013
30	0.0007	0.0048	0.0025
35	0.0016	0.0079	0.0037
40	0.0030	0.0110	0.0051
45	0.0053	0.0141	0.0067
50	0.0277	0.0185	0.0092
55	0.0409	0.0479	0.0151
60	0.0583	0.0602	0.0174

- The Police Industrial Disability rates are also used for Local Sheriff and Other Safety.
- Fifty Percent of the Police Industrial Disability rates are used for School Police.
- One Percent of the Police Industrial Disability rates are used for Local Prosecutors.
- Normally, rates are zero for Miscellaneous Plans unless the agency has specifically contracted for Industrial Disability benefits. If so, each miscellaneous non-industrial disability rate will be split into two components: 50 percent will become the Non-Industrial Disability rate and 50 percent will become the Industrial Disability rate.

Service Retirement

Retirement rates vary by age, service, and formula, except for the safety ½ @ 55 and 2% @ 55 formulas, where retirement rates vary by age only.

Service Retirement

Public Agency Miscellaneous 1.5% @ 65

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.008	0.011	0.013	0.015	0.017	0.019
51	0.007	0.010	0.012	0.013	0.015	0.017
52	0.010	0.014	0.017	0.019	0.021	0.024
53	0.008	0.012	0.015	0.017	0.019	0.022
54	0.012	0.016	0.019	0.022	0.025	0.028
55	0.018	0.025	0.031	0.035	0.038	0.043
56	0.015	0.021	0.025	0.029	0.032	0.036
57	0.020	0.028	0.033	0.038	0.043	0.048
58	0.024	0.033	0.040	0.046	0.052	0.058
59	0.028	0.039	0.048	0.054	0.060	0.067
60	0.049	0.069	0.083	0.094	0.105	0.118
61	0.062	0.087	0.106	0.120	0.133	0.150
62	0.104	0.146	0.177	0.200	0.223	0.251
63	0.099	0.139	0.169	0.191	0.213	0.239
64	0.097	0.136	0.165	0.186	0.209	0.233
65	0.140	0.197	0.240	0.271	0.302	0.339
66	0.092	0.130	0.157	0.177	0.198	0.222
67	0.129	0.181	0.220	0.249	0.277	0.311
68	0.092	0.129	0.156	0.177	0.197	0.221
69	0.092	0.130	0.158	0.178	0.199	0.224
70	0.103	0.144	0.175	0.198	0.221	0.248

Public Agency Miscellaneous 2% @ 60

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.010	0.013	0.015	0.018	0.019	0.021
51	0.009	0.011	0.014	0.016	0.017	0.019
52	0.011	0.014	0.017	0.020	0.022	0.024
53	0.010	0.012	0.015	0.017	0.020	0.021
54	0.015	0.019	0.023	0.025	0.029	0.031
55	0.022	0.029	0.035	0.040	0.045	0.049
56	0.018	0.024	0.028	0.033	0.036	0.040
57	0.024	0.032	0.038	0.043	0.049	0.053
58	0.027	0.036	0.043	0.049	0.055	0.061
59	0.033	0.044	0.054	0.061	0.068	0.076
60	0.056	0.077	0.092	0.105	0.117	0.130
61	0.071	0.097	0.118	0.134	0.149	0.166
62	0.117	0.164	0.198	0.224	0.250	0.280
63	0.122	0.171	0.207	0.234	0.261	0.292
64	0.114	0.159	0.193	0.218	0.244	0.271
65	0.150	0.209	0.255	0.287	0.321	0.358
66	0.114	0.158	0.192	0.217	0.243	0.270
67	0.141	0.196	0.238	0.270	0.301	0.337
68	0.103	0.143	0.174	0.196	0.219	0.245
69	0.109	0.153	0.185	0.209	0.234	0.261
70	0.117	0.162	0.197	0.222	0.248	0.277

Service Retirement

Public Agency Miscellaneous 2% @ 55

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.014	0.018	0.021	0.025	0.027	0.031
51	0.012	0.014	0.017	0.020	0.021	0.025
52	0.013	0.017	0.019	0.023	0.025	0.028
53	0.015	0.020	0.023	0.027	0.030	0.034
54	0.026	0.033	0.038	0.045	0.051	0.059
55	0.048	0.061	0.074	0.088	0.100	0.117
56	0.042	0.053	0.063	0.075	0.085	0.100
57	0.044	0.056	0.067	0.081	0.091	0.107
58	0.049	0.062	0.074	0.089	0.100	0.118
59	0.057	0.072	0.086	0.103	0.118	0.138
60	0.067	0.086	0.103	0.123	0.139	0.164
61	0.081	0.103	0.124	0.148	0.168	0.199
62	0.116	0.147	0.178	0.214	0.243	0.288
63	0.114	0.144	0.174	0.208	0.237	0.281
64	0.108	0.138	0.166	0.199	0.227	0.268
65	0.155	0.197	0.238	0.285	0.325	0.386
66	0.132	0.168	0.203	0.243	0.276	0.328
67	0.122	0.155	0.189	0.225	0.256	0.304
68	0.111	0.141	0.170	0.204	0.232	0.274
69	0.114	0.144	0.174	0.209	0.238	0.282
70	0.130	0.165	0.200	0.240	0.272	0.323

Public Agency Miscellaneous 2.5% @ 55

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.004	0.009	0.019	0.029	0.049	0.094
51	0.004	0.009	0.019	0.029	0.049	0.094
52	0.004	0.009	0.020	0.030	0.050	0.095
53	0.008	0.014	0.025	0.036	0.058	0.104
54	0.024	0.034	0.050	0.066	0.091	0.142
55	0.066	0.088	0.115	0.142	0.179	0.241
56	0.042	0.057	0.078	0.098	0.128	0.184
57	0.041	0.057	0.077	0.097	0.128	0.183
58	0.045	0.061	0.083	0.104	0.136	0.192
59	0.055	0.074	0.098	0.123	0.157	0.216
60	0.066	0.088	0.115	0.142	0.179	0.241
61	0.072	0.095	0.124	0.153	0.191	0.255
62	0.099	0.130	0.166	0.202	0.248	0.319
63	0.092	0.121	0.155	0.189	0.233	0.302
64	0.091	0.119	0.153	0.187	0.231	0.299
65	0.122	0.160	0.202	0.245	0.297	0.374
66	0.138	0.179	0.226	0.272	0.329	0.411
67	0.114	0.149	0.189	0.229	0.279	0.354
68	0.100	0.131	0.168	0.204	0.250	0.322
69	0.114	0.149	0.189	0.229	0.279	0.354
70	0.127	0.165	0.209	0.253	0.306	0.385

Service Retirement

Public Agency Miscellaneous 2.7% @ 55

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.004	0.009	0.014	0.035	0.055	0.095
51	0.002	0.006	0.011	0.030	0.050	0.090
52	0.006	0.012	0.017	0.038	0.059	0.099
53	0.010	0.017	0.024	0.046	0.068	0.110
54	0.032	0.044	0.057	0.085	0.113	0.160
55	0.076	0.101	0.125	0.165	0.205	0.265
56	0.055	0.074	0.093	0.127	0.160	0.214
57	0.050	0.068	0.086	0.118	0.151	0.204
58	0.055	0.074	0.093	0.127	0.161	0.215
59	0.061	0.082	0.102	0.138	0.174	0.229
60	0.069	0.093	0.116	0.154	0.192	0.250
61	0.086	0.113	0.141	0.183	0.225	0.288
62	0.105	0.138	0.171	0.218	0.266	0.334
63	0.103	0.135	0.167	0.215	0.262	0.329
64	0.109	0.143	0.177	0.226	0.275	0.344
65	0.134	0.174	0.215	0.270	0.326	0.401
66	0.147	0.191	0.235	0.294	0.354	0.433
67	0.121	0.158	0.196	0.248	0.300	0.372
68	0.113	0.147	0.182	0.232	0.282	0.352
69	0.117	0.153	0.189	0.240	0.291	0.362
70	0.141	0.183	0.226	0.283	0.341	0.418

Public Agency Miscellaneous 3% @ 60

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.012	0.018	0.024	0.039	0.040	0.091
51	0.009	0.014	0.019	0.034	0.034	0.084
52	0.014	0.020	0.026	0.043	0.044	0.096
53	0.016	0.023	0.031	0.048	0.050	0.102
54	0.026	0.036	0.045	0.065	0.070	0.125
55	0.043	0.057	0.072	0.096	0.105	0.165
56	0.042	0.056	0.070	0.094	0.103	0.162
57	0.049	0.065	0.082	0.108	0.119	0.180
58	0.057	0.076	0.094	0.122	0.136	0.199
59	0.076	0.100	0.123	0.157	0.175	0.244
60	0.114	0.148	0.182	0.226	0.255	0.334
61	0.095	0.123	0.152	0.190	0.214	0.288
62	0.133	0.172	0.211	0.260	0.294	0.378
63	0.129	0.166	0.204	0.252	0.285	0.368
64	0.143	0.185	0.226	0.278	0.315	0.401
65	0.202	0.260	0.318	0.386	0.439	0.542
66	0.177	0.228	0.279	0.340	0.386	0.482
67	0.151	0.194	0.238	0.292	0.331	0.420
68	0.139	0.179	0.220	0.270	0.306	0.391
69	0.190	0.245	0.299	0.364	0.414	0.513
70	0.140	0.182	0.223	0.274	0.310	0.396

Service Retirement

Public Agency Miscellaneous 2% @ 62						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.000	0.000	0.000	0.000	0.000	0.000
51	0.000	0.000	0.000	0.000	0.000	0.000
52	0.010	0.013	0.016	0.019	0.022	0.024
53	0.013	0.017	0.020	0.024	0.027	0.031
54	0.021	0.027	0.033	0.039	0.045	0.050
55	0.044	0.056	0.068	0.080	0.092	0.104
56	0.030	0.039	0.047	0.055	0.063	0.072
57	0.036	0.046	0.056	0.066	0.076	0.086
58	0.046	0.059	0.072	0.085	0.097	0.110
59	0.058	0.074	0.089	0.105	0.121	0.137
60	0.062	0.078	0.095	0.112	0.129	0.146
61	0.062	0.079	0.096	0.113	0.129	0.146
62	0.097	0.123	0.150	0.176	0.202	0.229
63	0.089	0.113	0.137	0.162	0.186	0.210
64	0.094	0.120	0.145	0.171	0.197	0.222
65	0.129	0.164	0.199	0.234	0.269	0.304
66	0.105	0.133	0.162	0.190	0.219	0.247
67	0.105	0.133	0.162	0.190	0.219	0.247
68	0.105	0.133	0.162	0.190	0.219	0.247
69	0.105	0.133	0.162	0.190	0.219	0.247
70	0.125	0.160	0.194	0.228	0.262	0.296

Service Retirement

Public Agency Fire ½ @ 55 and 2% @ 55			
Age	Rate	Age	Rate
50	0.0159	56	0.1108
51	0.0000	57	0.0000
52	0.0344	58	0.0950
53	0.0199	59	0.0441
54	0.0413	60	1.00000
55	0.0751		

Public Agency Police ½ @ 55 and 2% @ 55			
Age	Rate	Age	Rate
50	0.0255	56	0.0692
51	0.0000	57	0.0511
52	0.0164	58	0.0724
53	0.0272	59	0.0704
54	0.0095	60	1.0000
55	0.1667		

Service Retirement

Public Agency Police 2% @ 50						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.005	0.005	0.005	0.005	0.017	0.089
51	0.005	0.005	0.005	0.005	0.017	0.087
52	0.018	0.018	0.018	0.018	0.042	0.132
53	0.044	0.044	0.044	0.044	0.090	0.217
54	0.065	0.065	0.065	0.065	0.126	0.283
55	0.086	0.086	0.086	0.086	0.166	0.354
56	0.067	0.067	0.067	0.067	0.130	0.289
57	0.066	0.066	0.066	0.066	0.129	0.288
58	0.066	0.066	0.066	0.066	0.129	0.288
59	0.139	0.139	0.139	0.139	0.176	0.312
60	0.123	0.123	0.123	0.123	0.153	0.278
61	0.110	0.110	0.110	0.110	0.138	0.256
62	0.130	0.130	0.130	0.130	0.162	0.291
63	0.130	0.130	0.130	0.130	0.162	0.291
64	0.130	0.130	0.130	0.130	0.162	0.291
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police and Other Safety.

Service Retirement

Public Agency Fire 2% @ 50						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.009	0.009	0.009	0.009	0.013	0.020
51	0.013	0.013	0.013	0.013	0.020	0.029
52	0.018	0.018	0.018	0.018	0.028	0.042
53	0.052	0.052	0.052	0.052	0.079	0.119
54	0.067	0.067	0.067	0.067	0.103	0.154
55	0.089	0.089	0.089	0.089	0.136	0.204
56	0.083	0.083	0.083	0.083	0.127	0.190
57	0.082	0.082	0.082	0.082	0.126	0.189
58	0.088	0.088	0.088	0.088	0.136	0.204
59	0.074	0.074	0.074	0.074	0.113	0.170
60	0.100	0.100	0.100	0.100	0.154	0.230
61	0.072	0.072	0.072	0.072	0.110	0.165
62	0.099	0.099	0.099	0.099	0.152	0.228
63	0.114	0.114	0.114	0.114	0.175	0.262
64	0.114	0.114	0.114	0.114	0.175	0.262
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% @ 55						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.004	0.004	0.004	0.004	0.015	0.086
51	0.014	0.014	0.014	0.014	0.034	0.114
52	0.026	0.026	0.026	0.026	0.060	0.154
53	0.038	0.038	0.038	0.038	0.083	0.188
54	0.071	0.071	0.071	0.071	0.151	0.292
55	0.061	0.061	0.061	0.061	0.131	0.261
56	0.072	0.072	0.072	0.072	0.153	0.295
57	0.065	0.065	0.065	0.065	0.140	0.273
58	0.066	0.066	0.066	0.066	0.142	0.277
59	0.118	0.118	0.118	0.118	0.247	0.437
60	0.065	0.065	0.065	0.065	0.138	0.272
61	0.084	0.084	0.084	0.084	0.178	0.332
62	0.108	0.108	0.108	0.108	0.226	0.405
63	0.084	0.084	0.084	0.084	0.178	0.332
64	0.084	0.084	0.084	0.084	0.178	0.332
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police and Other Safety.

Service Retirement

Public Agency Fire 3% @ 55						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.001	0.001	0.001	0.006	0.016	0.069
51	0.002	0.002	0.002	0.006	0.018	0.071
52	0.012	0.012	0.012	0.021	0.040	0.098
53	0.032	0.032	0.032	0.049	0.085	0.149
54	0.057	0.057	0.057	0.087	0.144	0.217
55	0.073	0.073	0.073	0.109	0.179	0.259
56	0.064	0.064	0.064	0.097	0.161	0.238
57	0.063	0.063	0.063	0.095	0.157	0.233
58	0.065	0.065	0.065	0.099	0.163	0.241
59	0.088	0.088	0.088	0.131	0.213	0.299
60	0.105	0.105	0.105	0.155	0.251	0.344
61	0.118	0.118	0.118	0.175	0.282	0.380
62	0.087	0.087	0.087	0.128	0.210	0.295
63	0.067	0.067	0.067	0.100	0.165	0.243
64	0.067	0.067	0.067	0.100	0.165	0.243
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% @ 50						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.050	0.050	0.050	0.099	0.240	0.314
51	0.034	0.034	0.034	0.072	0.198	0.260
52	0.033	0.033	0.033	0.071	0.198	0.259
53	0.039	0.039	0.039	0.080	0.212	0.277
54	0.045	0.045	0.045	0.092	0.229	0.300
55	0.052	0.052	0.052	0.105	0.248	0.323
56	0.042	0.042	0.042	0.087	0.221	0.289
57	0.043	0.043	0.043	0.088	0.223	0.292
58	0.054	0.054	0.054	0.109	0.255	0.333
59	0.054	0.054	0.054	0.108	0.253	0.330
60	0.060	0.060	0.060	0.121	0.272	0.355
61	0.048	0.048	0.048	0.098	0.238	0.311
62	0.061	0.061	0.061	0.122	0.274	0.357
63	0.057	0.057	0.057	0.115	0.263	0.343
64	0.069	0.069	0.069	0.137	0.296	0.385
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police and Other Safety.

Service Retirement

Public Agency Fire 3% @ 50						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.020	0.020	0.020	0.040	0.130	0.192
51	0.008	0.008	0.008	0.023	0.107	0.164
52	0.023	0.023	0.023	0.043	0.136	0.198
53	0.023	0.023	0.023	0.043	0.135	0.198
54	0.027	0.027	0.027	0.048	0.143	0.207
55	0.043	0.043	0.043	0.070	0.174	0.244
56	0.053	0.053	0.053	0.085	0.196	0.269
57	0.054	0.054	0.054	0.086	0.197	0.271
58	0.052	0.052	0.052	0.084	0.193	0.268
59	0.075	0.075	0.075	0.116	0.239	0.321
60	0.065	0.065	0.065	0.102	0.219	0.298
61	0.076	0.076	0.076	0.117	0.241	0.324
62	0.068	0.068	0.068	0.106	0.224	0.304
63	0.027	0.027	0.027	0.049	0.143	0.208
64	0.094	0.094	0.094	0.143	0.277	0.366
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2% @ 57						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.011	0.011	0.011	0.011	0.020	0.036
51	0.009	0.009	0.009	0.009	0.016	0.028
52	0.018	0.018	0.018	0.018	0.034	0.060
53	0.037	0.037	0.037	0.037	0.067	0.119
54	0.049	0.049	0.049	0.049	0.089	0.159
55	0.063	0.063	0.063	0.063	0.115	0.205
56	0.045	0.045	0.045	0.045	0.082	0.146
57	0.064	0.064	0.064	0.064	0.117	0.209
58	0.047	0.047	0.047	0.047	0.086	0.154
59	0.105	0.105	0.105	0.105	0.130	0.191
60	0.105	0.105	0.105	0.105	0.129	0.188
61	0.105	0.105	0.105	0.105	0.129	0.188
62	0.105	0.105	0.105	0.105	0.129	0.188
63	0.105	0.105	0.105	0.105	0.129	0.188
64	0.105	0.105	0.105	0.105	0.129	0.188
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police and Other Safety.

Service Retirement

Public Agency Fire 2% @ 57						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.005	0.005	0.005	0.005	0.008	0.012
51	0.006	0.006	0.006	0.006	0.009	0.013
52	0.012	0.012	0.012	0.012	0.019	0.028
53	0.033	0.033	0.033	0.033	0.050	0.075
54	0.045	0.045	0.045	0.045	0.069	0.103
55	0.061	0.061	0.061	0.061	0.094	0.140
56	0.055	0.055	0.055	0.055	0.084	0.126
57	0.081	0.081	0.081	0.081	0.125	0.187
58	0.059	0.059	0.059	0.059	0.091	0.137
59	0.055	0.055	0.055	0.055	0.084	0.126
60	0.085	0.085	0.085	0.085	0.131	0.196
61	0.085	0.085	0.085	0.085	0.131	0.196
62	0.085	0.085	0.085	0.085	0.131	0.196
63	0.085	0.085	0.085	0.085	0.131	0.196
64	0.085	0.085	0.085	0.085	0.131	0.196
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2.5% @ 57						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.014	0.014	0.014	0.014	0.025	0.045
51	0.012	0.012	0.012	0.012	0.021	0.038
52	0.025	0.025	0.025	0.025	0.046	0.081
53	0.047	0.047	0.047	0.047	0.086	0.154
54	0.063	0.063	0.063	0.063	0.115	0.205
55	0.076	0.076	0.076	0.076	0.140	0.249
56	0.054	0.054	0.054	0.054	0.099	0.177
57	0.071	0.071	0.071	0.071	0.130	0.232
58	0.057	0.057	0.057	0.057	0.103	0.184
59	0.126	0.126	0.126	0.126	0.156	0.229
60	0.126	0.126	0.126	0.126	0.155	0.226
61	0.126	0.126	0.126	0.126	0.155	0.226
62	0.126	0.126	0.126	0.126	0.155	0.226
63	0.126	0.126	0.126	0.126	0.155	0.226
64	0.126	0.126	0.126	0.126	0.155	0.226
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police and Other Safety.

Service Retirement

Public Agency Fire 2.5% @ 57						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.007	0.007	0.007	0.007	0.010	0.015
51	0.008	0.008	0.008	0.008	0.012	0.018
52	0.016	0.016	0.016	0.016	0.025	0.038
53	0.042	0.042	0.042	0.042	0.064	0.096
54	0.057	0.057	0.057	0.057	0.088	0.132
55	0.074	0.074	0.074	0.074	0.114	0.170
56	0.066	0.066	0.066	0.066	0.102	0.153
57	0.090	0.090	0.090	0.090	0.139	0.208
58	0.071	0.071	0.071	0.071	0.110	0.164
59	0.066	0.066	0.066	0.066	0.101	0.151
60	0.102	0.102	0.102	0.102	0.157	0.235
61	0.102	0.102	0.102	0.102	0.157	0.236
62	0.102	0.102	0.102	0.102	0.157	0.236
63	0.102	0.102	0.102	0.102	0.157	0.236
64	0.102	0.102	0.102	0.102	0.157	0.236
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2.7% @ 57						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.0138	0.0138	0.0138	0.0138	0.0253	0.0451
51	0.0123	0.0123	0.0123	0.0123	0.0226	0.0402
52	0.0249	0.0249	0.0249	0.0249	0.0456	0.0812
53	0.0497	0.0497	0.0497	0.0497	0.0909	0.1621
54	0.0662	0.0662	0.0662	0.0662	0.1211	0.2160
55	0.0854	0.0854	0.0854	0.0854	0.1563	0.2785
56	0.0606	0.0606	0.0606	0.0606	0.1108	0.1975
57	0.0711	0.0711	0.0711	0.0711	0.1300	0.2318
58	0.0628	0.0628	0.0628	0.0628	0.1149	0.2049
59	0.1396	0.1396	0.1396	0.1396	0.1735	0.2544
60	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
61	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
62	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
63	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
64	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
65	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police and Other Safety.

Service Retirement

Public Agency Fire 2.7% @ 57						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.0065	0.0065	0.0065	0.0065	0.0101	0.0151
51	0.0081	0.0081	0.0081	0.0081	0.0125	0.0187
52	0.0164	0.0164	0.0164	0.0164	0.0254	0.0380
53	0.0442	0.0442	0.0442	0.0442	0.0680	0.1018
54	0.0606	0.0606	0.0606	0.0606	0.0934	0.1397
55	0.0825	0.0825	0.0825	0.0825	0.1269	0.1900
56	0.0740	0.0740	0.0740	0.0740	0.1140	0.1706
57	0.0901	0.0901	0.0901	0.0901	0.1387	0.2077
58	0.0790	0.0790	0.0790	0.0790	0.1217	0.1821
59	0.0729	0.0729	0.0729	0.0729	0.1123	0.1681
60	0.1135	0.1135	0.1135	0.1135	0.1747	0.2615
61	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
62	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
63	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
64	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
65	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Service Retirement

Schools 2% @ 55						
Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.005	0.009	0.013	0.015	0.016	0.018
51	0.005	0.010	0.014	0.017	0.019	0.021
52	0.006	0.012	0.017	0.020	0.022	0.025
53	0.007	0.014	0.019	0.023	0.026	0.029
54	0.012	0.024	0.033	0.039	0.044	0.049
55	0.024	0.048	0.067	0.079	0.088	0.099
56	0.020	0.039	0.055	0.065	0.072	0.081
57	0.021	0.042	0.059	0.070	0.078	0.087
58	0.025	0.050	0.070	0.083	0.092	0.103
59	0.029	0.057	0.080	0.095	0.105	0.118
60	0.037	0.073	0.102	0.121	0.134	0.150
61	0.046	0.090	0.126	0.149	0.166	0.186
62	0.076	0.151	0.212	0.250	0.278	0.311
63	0.069	0.136	0.191	0.225	0.251	0.281
64	0.067	0.133	0.185	0.219	0.244	0.273
65	0.091	0.180	0.251	0.297	0.331	0.370
66	0.072	0.143	0.200	0.237	0.264	0.295
67	0.067	0.132	0.185	0.218	0.243	0.272
68	0.060	0.118	0.165	0.195	0.217	0.243
69	0.067	0.133	0.187	0.220	0.246	0.275
70	0.066	0.131	0.183	0.216	0.241	0.270

Miscellaneous

Superfunded Status

Prior to enactment of the Public Employees' Pension Reform Act (PEPRA) that became effective January 1, 2013, a plan in superfunded status (actuarial value of assets exceeding present value of benefits) would normally pay a zero employer contribution rate while also being permitted to use its superfunded assets to pay its employees' normal member contributions.

However, Section 7522.52(a) of PEPRA states, "In any fiscal year a public employer's contribution to a defined benefit plan, in combination with employee contributions to that defined benefit plan, shall not be less than the total normal cost rate..." This means that not only must employers pay their employer normal cost regardless of plan surplus, but also, employers may no longer use superfunded assets to pay employee normal member contributions.

Internal Revenue Code Section 415

The limitations on benefits imposed by Internal Revenue Code Section 415 are taken into account in this valuation. Each year the impact of any changes in this limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. This results in lower contributions for those employers contributing to the Replacement Benefit Fund and protects CalPERS from prefunding expected benefits in excess of limits imposed by federal tax law.

Internal Revenue Code Section 401(a)(17)

The limitations on compensation imposed by Internal Revenue Code Section 401(a)(17) are taken into account in this valuation. Each year, the impact of any changes in the compensation limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base.

PEPRA Assumptions

The Public Employees' Pension Reform Act of 2013 (PEPRA) mandated new benefit formulas and new member contributions for new members (as defined by PEPRA) hired after January 1, 2013. For non-pooled plans, these new members were first reflected in the June 30, 2013 non-pooled plan valuations. New members in pooled plans were first reflected in the new Miscellaneous and Safety risk pools created by the CalPERS Board in November 2012 in response to the passage of PEPRA, also beginning with the June 30, 2013 valuation. Assumptions for PEPRA members are disclosed in Appendix A tables.

APPENDIX B

PRINCIPAL PLAN PROVISIONS

The following is a description of the principal plan provisions used in calculating costs and liabilities. We have indicated whether a plan provision is standard or optional. Standard benefits are applicable to all members while optional benefits vary among employers. Optional benefits that apply to a single period of time, such as Golden Handshakes, have not been included. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the complex Public Employees' Retirement Law. The law itself governs in all situations. For a full listing of all optional benefits refer to the PERS-CON-40 available on CalPERS website by choosing Employer Information > Retirement Benefit Programs & Contracting Services > Retirement Benefits Program > Contract Information > Optional Benefits

Service Retirement

Eligibility

A classic CalPERS member or PEPRA Safety member becomes eligible for Service Retirement upon attainment of age 50 with at least 5 years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). For employees hired into a plan with the 1.5 percent at 65 formula, eligibility for service retirement is age 55 with at least 5 years of service. PEPRA miscellaneous members become eligible for Service Retirement upon attainment of age 52 with at least 5 years of service.

Benefit

The Service Retirement benefit is a monthly allowance equal to the product of the *benefit factor*, *years of service*, and *final compensation*.

- The *benefit factor* depends on the benefit formula specified in your agency's contract. The table below shows the factors for each of the available formulas. Factors vary by the member's age at retirement. Listed are the factors for retirement at whole year ages:

Miscellaneous Plan Formulas

Retirement Age	1.5% at 65	2% at 60	2% at 55	2.5% at 55	2.7% at 55	3% at 60	PEPRA 2% at 62
50	0.5000%	1.092%	1.426%	2.000%	2.000%	2.000%	N/A
51	0.5667%	1.156%	1.522%	2.100%	2.140%	2.100%	N/A
52	0.6334%	1.224%	1.628%	2.200%	2.280%	2.200%	1.000%
53	0.7000%	1.296%	1.742%	2.300%	2.420%	2.300%	1.100%
54	0.7667%	1.376%	1.866%	2.400%	2.560%	2.400%	1.200%
55	0.8334%	1.460%	2.000%	2.500%	2.700%	2.500%	1.300%
56	0.9000%	1.552%	2.052%	2.500%	2.700%	2.600%	1.400%
57	0.9667%	1.650%	2.104%	2.500%	2.700%	2.700%	1.500%
58	1.0334%	1.758%	2.156%	2.500%	2.700%	2.800%	1.600%
59	1.1000%	1.874%	2.210%	2.500%	2.700%	2.900%	1.700%
60	1.1667%	2.000%	2.262%	2.500%	2.700%	3.000%	1.800%
61	1.2334%	2.134%	2.314%	2.500%	2.700%	3.000%	1.900%
62	1.3000%	2.272%	2.366%	2.500%	2.700%	3.000%	2.000%
63	1.3667%	2.418%	2.418%	2.500%	2.700%	3.000%	2.100%
64	1.4334%	2.418%	2.418%	2.500%	2.700%	3.000%	2.200%
65	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.300%
66	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.400%
67 & up	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.500%

Safety Plan Formulas

Retirement Age	½ at 55 *	2% at 55	2% at 50	3% at 55	3% at 50
50	1.783%	1.426%	2.000%	2.400%	3.000%
51	1.903%	1.522%	2.140%	2.520%	3.000%
52	2.035%	1.628%	2.280%	2.640%	3.000%
53	2.178%	1.742%	2.420%	2.760%	3.000%
54	2.333%	1.866%	2.560%	2.880%	3.000%
55 & Up	2.500%	2.000%	2.700%	3.000%	3.000%

* For this formula, the benefit factor also varies by entry age. The factors shown are for members with an entry age of 35 or greater. If entry age is less than 35, then the age 55 benefit factor is 50 percent divided by the difference between age 55 and entry age. The benefit factor for ages prior to age 55 is the same proportion of the age 55 benefit factor as in the above table.

PEPRA Safety Plan Formulas

Retirement Age	2% at 57	2.5% at 57	2.7% at 57
50	1.426%	2.000%	2.000%
51	1.508%	2.071%	2.100%
52	1.590%	2.143%	2.200%
53	1.672%	2.214%	2.300%
54	1.754%	2.286%	2.400%
55	1.836%	2.357%	2.500%
56	1.918%	2.429%	2.600%
57 & Up	2.000%	2.500%	2.700%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. An agency may contract for an optional benefit where any unused sick leave accumulated at the time of retirement will be converted to credited service at a rate of 0.004 years of service for each day of sick leave.
- The *final compensation* is the monthly average of the member's highest 36 or 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). The standard benefit is 36 months. Employers had the option of providing a final compensation equal to the highest 12 consecutive months for classic plans only. Final compensation must be defined by the highest 36 consecutive months' pay under the 1.5% at 65 formula. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security Contribution and Benefit Base. For employees that participate in Social Security this cap is \$115,064 for 2014 and for those employees that do not participate in social security the cap for 2014 is \$138,077, the equivalent of 120 percent of the 2013 Contribution and Benefit Base. Adjustments to the caps are permitted annually based on changes to the CPI for All Urban Consumers.
- Employees must be covered by Social Security with the 1.5% at 65 formula. Social Security is optional for all other benefit formulas. For employees covered by Social Security, the Modified formula is the standard benefit. Under this type of formula, the final compensation is offset by \$133.33 (or by one third if the final compensation is less than \$400). Employers may contract for the Full benefit with Social Security that will eliminate the offset

applicable to the final compensation. For employees not covered by Social Security, the Full benefit is paid with no offsets. Auxiliary organizations of the CSUC system may elect reduced contribution rates, in which case the offset is \$317 if members are not covered by Social Security or \$513 if members are covered by Social Security.

- The Miscellaneous Service Retirement benefit is not capped. The Safety Service Retirement benefit is capped at 90 percent of final compensation.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least 5 years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS classic members and Safety PEPPA members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 50 (55 for employees hired into a 1.5% @ 65 plan). PEPPA Miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 52.

Benefit

The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least 5 years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury, which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively employed by any CalPERS employer at the time of disability in order to be eligible for this benefit.

Standard Benefit

The standard Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8 percent of final compensation, multiplied by *service*, which is determined as follows:

- *Service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or
- *Service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3 percent of Final Compensation.

Improved Benefit

Employers have the option of providing the improved Non-Industrial Disability Retirement benefit. This benefit provides a monthly allowance equal to 30 percent of final compensation for the first 5 years of service, plus 1 percent for each additional year of service to a maximum of 50 percent of final compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job Related) Disability Retirement

All safety members have this benefit. For miscellaneous members, employers have the option of providing this benefit. An employer may choose to provide the Increased benefit option or the Improved benefit option.

Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes disabled while working, where disabled means the member is unable to perform the duties of the job because of a work-related illness or injury, which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described below.

Standard Benefit

The standard Industrial Disability Retirement benefit is a monthly allowance equal to 50 percent of final compensation.

Increased Benefit (75 percent of Final Compensation)

The increased Industrial Disability Retirement benefit is a monthly allowance equal to 75 percent final compensation for total disability.

Improved Benefit (50 percent to 90 percent of Final Compensation)

The improved Industrial Disability Retirement benefit is a monthly allowance equal to the Workman's Compensation Appeals Board permanent disability rate percentage (if 50 percent or greater, with a maximum of 90 percent) times the final compensation.

For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return of accumulated member contributions with respect to employment in this group. With the standard or increased benefit, a member may also choose to receive the annuitization of the accumulated member contributions.

If a member is eligible for Service Retirement and if the Service Retirement benefit is more than the Industrial Disability Retirement benefit, the member may choose to receive the larger benefit.

Post-Retirement Death Benefit

Standard Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of \$500 will be made to the retiree's designated survivor(s), or to the retiree's estate.

Improved Lump Sum Payment

Employers have the option of providing an improved lump sum death benefit of \$600, \$2,000, \$3,000, \$4,000 or \$5,000.

Form of Payment for Retirement Allowance

Standard Form of Payment

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

Improved Form of Payment (Post Retirement Survivor Allowance)

Employers have the option to contract for the post retirement survivor allowance.

For retirement allowances with respect to service subject to the modified formula, 25 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. For retirement allowances with respect to service subject to the full or supplemental formula, 50 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. This additional benefit is often referred to as post retirement survivor allowance (PRSA) or simply as survivor continuance.

In other words, 25 percent or 50 percent of the allowance, the continuance portion, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime. This benefit will not be discontinued in the event the spouse remarries.

The remaining 75 percent or 50 percent of the retirement allowance, which may be referred to as the option portion of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this option portion to be paid to any designated beneficiary after the retiree's death. Benefit options applicable to the option portion are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the option portion.

Pre-Retirement Death Benefits

Basic Death Benefit

This is a standard benefit.

Eligibility

An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this Basic Death benefit.

Benefit

The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year, plus a lump sum in the amount of one month's salary for each completed year of current service, up to a maximum of six months' salary. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

1957 Survivor Benefit

This is a standard benefit.

Eligibility

An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least 5 years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this 1957 Survivor benefit.

Benefit

The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. The total amount paid will be at least equal to the Basic Death benefit.

Optional Settlement 2W Death Benefit

This is an optional benefit.

Eligibility

An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least 5 years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this Optional Settlement 2W Death benefit.

Benefit

The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried children under age 18, if applicable. The total amount paid will be at least equal to the Basic Death Benefit.

Special Death Benefit

This is a standard benefit for safety members. An employer may elect to provide this benefit for miscellaneous members.

Eligibility

An employee's *eligible survivor(s)* may receive the Special Death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The Special Death benefit is a monthly allowance equal to 50 percent of final compensation, and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death at which time the allowance is continued to any unmarried children under age 22. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving children (*eligible* means unmarried children under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5 percent of final compensation
- if 2 eligible children: 20.0 percent of final compensation
- if 3 or more eligible children: 25.0 percent of final compensation

Alternate Death Benefit for Local Fire Members

This is an optional benefit available only to local fire members.

Eligibility

An employee's *eligible survivor(s)* may receive the Alternate Death benefit in lieu of the Basic Death Benefit or the 1957 Survivor Benefit if the member dies while actively employed and has at least 20 years of total CalPERS service. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 18.

Benefit

The Alternate Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) If the member has not yet attained age 50, the benefit is equal to that which would be payable if the member had retired at age 50, based on service credited at the time of death. The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried children under age 18, if applicable. The total amount paid will be at least equal to the Basic Death Benefit.

Cost-of-Living Adjustments (COLA)

Standard Benefit

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2 percent. Annual adjustments are calculated by first determining the lesser of 1) 2 percent compounded from the end of the year of retirement or 2) actual rate of inflation. The resulting increase is divided by the total increase provided in prior years. For any particular year, the COLA adjustment may be less than 2 percent (when the rate of inflation is low), may be greater than the rate of inflation (when the rate of inflation is low after several years of high inflation) or may even be greater than 2 percent (when inflation is high after several years of low inflation).

Improved Benefit

Employers have the option of providing a COLA of 3 percent, 4 percent, or 5 percent, determined in the same manner as described above for the standard 2 percent COLA. An improved COLA is not available with the 1.5% at 65 formula.

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 80 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan.

Employee Contributions

Each employee contributes toward his or her retirement based upon the retirement formula. The standard employee contribution is as described below.

The percent contributed below the monthly compensation breakpoint is 0 percent.

The monthly compensation breakpoint is \$0 for full and supplemental formula members and \$133.33 for employees covered by the modified formula.

The percent contributed above the monthly compensation breakpoint depends upon the benefit formula, as shown in the table below.

Benefit Formula	Percent Contributed above the Breakpoint
Miscellaneous, 1.5% at 65	2%
Miscellaneous, 2% at 60	7%
Miscellaneous, 2% at 55	7%
Miscellaneous, 2.5% at 55	8%
Miscellaneous, 2.7% at 55	8%
Miscellaneous, 3% at 60	8%
Miscellaneous, 2% at 62	50% of the Total Normal Cost
Safety, 1/2 at 55	Varies by entry age
Safety, 2% at 55	7%
Safety, 2% at 50	9%
Safety, 3% at 55	9%
Safety, 3% at 50	9%
Safety, 2% at 57	50% of the Total Normal Cost
Safety, 2.5% at 57	50% of the Total Normal Cost
Safety, 2.7% at 57	50% of the Total Normal Cost

The employer may choose to "pick-up" these contributions for the employees (Employer Paid Member Contributions or EPMC). EPMC is prohibited for new PEPRA members.

An employer may also include Employee Cost Sharing in the contract, where employees agree to share the cost of the employer contribution. These contributions are paid in addition to the member contribution.

Auxiliary organizations of the CSUC system may elect reduced contribution rates, in which case the offset is \$317 and the contribution rate is 6 percent if members are not covered by Social Security. If members are covered by Social Security, the offset is \$513 and the contribution rate is 5 percent.

Refund of Employee Contributions

If the member's service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6 percent interest.

1959 Survivor Benefit

This is a pre-retirement death benefit available only to members not covered by Social Security. Any agency joining CalPERS subsequent to 1993 was required to provide this benefit if the members were not covered by Social Security. The benefit is optional for agencies joining CalPERS prior to 1994. Levels 1, 2 and 3 are now closed. Any new agency or any agency wishing to add this benefit or increase the current level must choose the 4th or Indexed Level.

This benefit is not included in the results presented in this valuation. More information on this benefit is available on the CalPERS website at www.calpers.ca.gov.

APPENDIX C

PARTICIPANT DATA

- **SUMMARY OF VALUATION DATA**
- **ACTIVE MEMBERS**
- **TRANSFERRED AND TERMINATED MEMBERS**
- **RETIRED MEMBERS AND BENEFICIARIES**

Summary of Valuation Data

	June 30, 2013	June 30, 2014
1. Active Members		
a) Counts	15,530	15,934
b) Average Attained Age	43.98	44.08
c) Average Entry Age to Rate Plan	34.37	34.33
d) Average Years of Service	9.61	9.75
e) Average Annual Covered Pay	\$ 55,157	\$ 56,327
f) Annual Covered Payroll	856,593,282	897,506,714
g) Projected Annual Payroll for Contribution Year	936,022,607	980,729,819
h) Present Value of Future Payroll	7,038,876,851	7,218,954,833
2. Transferred Members		
a) Counts	3,635	3,811
b) Average Attained Age	43.98	43.87
c) Average Years of Service	3.54	3.37
d) Average Annual Covered Pay	\$ 73,276	\$ 75,454
3. Terminated Members		
a) Counts	7,414	7,758
b) Average Attained Age	43.35	43.63
c) Average Years of Service	2.22	2.21
d) Average Annual Covered Pay	\$ 41,990	\$ 42,526
4. Retired Members and Beneficiaries		
a) Counts	8,880	9,247
b) Average Attained Age	68.03	68.27
c) Average Annual Benefits	\$ 21,235	\$ 21,973
5. Active to Retired Ratio [(1a) / (4a)]	1.75	1.72

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Average Annual Benefits represents benefit amounts payable by this plan only. Some members may have service with another agency and would therefore have a larger total benefit than would be included as part of the average shown here.

Active Members

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Distribution of Active Members by Age and Service

Attained Age	Years of Service at Valuation Date						Total
	0-4	5-9	10-14	15-19	20-25	25+	
15-24	390	6	0	0	0	0	396
25-29	1111	398	2	0	0	0	1,511
30-34	977	982	209	7	0	0	2,175
35-39	670	852	469	133	4	0	2,128
40-44	545	789	521	333	93	7	2,288
45-49	438	631	441	316	170	89	2,085
50-54	359	653	449	301	215	263	2,240
55-59	260	465	375	271	180	264	1,815
60-64	119	274	235	167	110	98	1,003
65 and over	39	83	78	45	17	31	293
All Ages	4908	5133	2779	1573	789	752	15,934

Distribution of Average Annual Salaries by Age and Service

Attained Age	Years of Service at Valuation Date						Average
	0-4	5-9	10-14	15-19	20-25	25+	
15-24	\$31,033	\$37,552	\$0	\$0	\$0	\$0	\$31,132
25-29	38,297	39,851	41,650	0	0	0	38,711
30-34	42,875	53,069	51,097	60,999	0	0	48,326
35-39	46,886	59,786	60,132	60,236	73,225	0	55,854
40-44	50,017	59,220	63,445	65,959	61,753	73,612	59,118
45-49	51,013	58,527	63,981	68,998	70,479	65,543	60,963
50-54	51,778	57,992	62,728	66,637	71,865	77,163	62,690
55-59	56,873	60,825	62,976	66,628	67,385	72,424	63,908
60-64	67,907	61,072	62,035	61,007	65,169	69,201	63,341
65 and over	69,904	61,808	70,598	68,448	70,809	88,852	69,629
All Ages	\$45,179	\$56,655	\$61,929	\$65,854	\$68,403	\$73,535	\$56,327

Transferred and Terminated Members

Distribution of Transfers to Other CalPERS Plans by Age and Service

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0-4	5-9	10-14	15-19	20-25	25+		
15-24	50	0	0	0	0	0	50	\$54,255
25-29	269	11	0	0	0	0	280	59,232
30-34	521	39	3	0	0	0	563	72,003
35-39	583	54	6	0	0	0	643	77,578
40-44	475	50	14	8	0	0	547	81,176
45-49	423	72	39	42	8	0	584	78,761
50-54	301	90	41	51	26	8	517	76,895
55-59	217	65	30	29	13	10	364	73,290
60-64	107	44	18	15	7	2	193	82,210
65 and over	53	12	5	0	0	0	70	73,397
All Ages	2999	437	156	145	54	20	3,811	75,454

Distribution of Terminated Participants with Funds on Deposit by Age and Service

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0-4	5-9	10-14	15-19	20-25	25+		
15-24	104	0	0	0	0	0	104	\$25,521
25-29	684	29	1	0	0	0	714	33,093
30-34	1094	119	2	0	0	0	1,215	39,360
35-39	1047	130	22	2	0	0	1,201	42,404
40-44	969	153	26	11	1	0	1,160	47,087
45-49	802	154	60	19	11	2	1,048	47,817
50-54	747	129	52	20	3	2	953	43,576
55-59	597	75	36	11	2	4	725	44,077
60-64	384	42	16	3	0	0	445	42,528
65 and over	181	9	2	0	1	0	193	40,110
All Ages	6609	840	217	66	18	8	7,758	42,526

Retired Members and Beneficiaries

Distribution of Retirees and Beneficiaries by Age and Retirement Type*

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	1	0	0	14	15
30-34	1	1	4	0	1	7	14
35-39	0	4	6	1	0	6	17
40-44	0	11	10	0	1	12	34
45-49	1	28	13	0	1	16	59
50-54	331	63	21	1	0	21	437
55-59	979	45	20	8	0	46	1,098
60-64	1747	74	31	10	0	73	1,935
65-69	1940	79	26	7	0	108	2,160
70-74	1246	53	9	3	0	112	1,423
75-79	696	37	10	4	0	100	847
80-84	450	25	4	3	0	112	594
85 and Over	402	12	0	3	0	197	614
All Ages	7793	432	155	40	3	824	9,247

Distribution of Average Annual Amounts for Retirees and Beneficiaries by Age and Retirement Type*

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Average
Under 30	\$0	\$0	\$161	\$0	\$0	\$2,502	\$2,346
30-34	637	13,185	191	0	152	3,429	2,767
35-39	0	4,080	268	8,271	0	5,603	3,518
40-44	0	10,252	429	0	121	11,353	7,453
45-49	15,779	10,205	3,668	0	842	7,860	8,064
50-54	19,348	11,888	1,457	40,466	0	10,367	17,029
55-59	24,886	12,092	1,335	7,710	0	11,258	23,236
60-64	29,409	11,227	2,102	11,712	0	14,952	27,640
65-69	26,070	12,564	2,268	10,489	0	16,421	24,757
70-74	24,087	12,188	1,199	14,503	0	15,096	22,771
75-79	17,961	11,122	610	4,465	0	12,191	16,713
80-84	14,869	8,542	743	4,454	0	9,929	13,524
85 and Over	13,815	13,094	0	10,608	0	10,509	12,724
All Ages	\$24,060	\$11,511	\$1,650	\$10,188	\$372	\$12,193	\$21,973

Retired Members and Beneficiaries (continued)

Distribution of Retirees and Beneficiaries by Years Retired and Retirement Type*

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Yrs	2551	63	35	11	1	314	2,975
5-9	2556	56	24	8	1	219	2,864
10-14	1235	110	36	9	1	144	1,535
15-19	708	108	18	3	0	82	919
20-24	381	47	17	3	0	36	484
25-29	212	19	11	3	0	18	263
30 and Over	150	29	14	3	0	11	207
All Years	7793	432	155	40	3	824	9,247

Distribution of Average Annual Amounts for Retirees and Beneficiaries by Years Retired and Retirement Type*

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Average
Under 5 Yrs	\$25,651	\$12,591	\$2,281	\$14,654	\$842	\$12,618	\$23,675
5-9	29,114	13,186	3,312	6,487	152	13,253	27,300
10-14	22,303	13,456	1,671	9,966	121	12,124	20,143
15-19	16,077	9,719	659	15,598	0	10,897	14,564
20-24	14,207	9,879	907	3,625	0	8,520	12,831
25-29	10,475	9,273	385	6,050	0	8,255	9,764
30 and Over	7,237	9,335	345	9,636	0	8,015	7,141
All Years	\$24,060	\$11,511	\$1,650	\$10,188	\$372	\$12,193	\$21,973

* Counts of members do not include alternate payees receiving benefits while the member is still working. Therefore, the total counts may not match information on page 25 of the report. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.