Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 12

MEETING DATE: **November 20, 2019**

SUBJECT: **Actuarial Valuation and Review and GASB 67 Report as of June 30, 2019**

SUBMITTED FOR: **___ Consent** **_X_ Deliberation and Action** **__ Receive and File**

RECOMMENDATION

Staff recommends the Board:

1) Adopt the 2020-21 fiscal year employer and member contribution rates recommended by Segal;
2) Receive and file the Actuarial Valuation and Review as of June 30, 2019; and
3) Receive and file the Governmental Accounting Standards Board Statement 67 Actuarial Valuation as of June 30, 2019.

PURPOSE

This item supports the 2019-20 Strategic Management Plan by maintaining prudent and effective funding policies and practices that assist in producing low contribution rate volatility and plan sustainability.

DISCUSSION

The Actuarial Valuation and Review as of June 30, 2019 prepared by Segal Consulting is attached. The following sections highlight key components of the valuation report. Segal will attend the Board Meeting to present the report and answer any questions.

Investment Return for 2018-19 – The market value investment return for 2018-19 was 7.17% compared to the assumed investment rate of return for the Plan of 7.00%. For 2018-19, the annual return for valuation purposes was 6.91% (as determined using the seven-year asset smoothing). [See page 23 of the valuation report]

As a result of higher-than-assumed investment returns on a market value basis, SCERS has a net deferred gains of $118.4 million as of June 30, 2019, which is slightly lower than prior year's net deferred gains of $128.9 million as of June 30, 2018. If SCERS earns the assumed rate of investment return, and all other actuarial assumptions are met, there will still be net investment gains on the actuarial value of assets in the next six years, which translates to moderate downward pressure on the employer contribution rates. SCERS also has $129.8 million in the Contingency Reserve available to help mitigate future losses. [See page 19 of the valuation report]

Funded Status – SCERS' funded status on a market value basis increased from 82.5% as of June 30, 2018 to 82.6% as of June 30, 2019. SCERS' funding status on an actuarial value of assets basis (using seven-year asset smoothing) increased from 81.4% as of June 30, 2018 to 81.6% as of June 30, 2019. [See page 10 of the valuation report]

Funded Status
Dollar Amounts in Thousands

Valuation Year Ending June 30	(1) Actuarial Accrued Liability	(2) Market Value of Assets	(3) Market Value of Assets as a % of Actuarial Accrued Liability (2)/(1)	(4) Actuarial Value of Assets	(5) Actuarial Value of Assets as a % of Actuarial Accrued Liability (4)/(1)
2019	$11,895,520	$9,821,694	82.6%	$9,703,313	81.6%
2018	$11,213,263	$9,251,937	82.5%	$9,123,004	81.4%

The Unfunded Actuarial Accrued Liability (UAAL) increased from $1.961 billion as of June 30, 2018 to $2.074 billion as of June 30, 2019, on a market value basis. On an actuarial value basis, the UAAL increased from $2.090 billion as of June 30, 2018 to $2.192 billion as of June 30, 2019.

Changes in Actuarial Assumptions – In May 2017, the Board approved changes in actuarial assumptions as recommended by the Plan actuary resulting from the 2016 Experience Study. The changes in actuarial assumptions resulted in material increases in contributions, in which the Board approved a plan to recognize the full impact of the assumption changes on member and employer normal cost immediately, and to phase-in the impact on the employer UAAL rate over three years. The phase-in will be completed in fiscal year 2020-21 and the full cost impact of the assumption changes will be recognized before the next triennial Experience Study to be conducted in spring of 2020, which could affect contribution rates in 2021-22.

Impact on Employer Contribution Rates - Contribution rates are expressed as a percentage of members' pension-eligible compensation, also known as a "percentage of payroll." The table below summarizes the impact on the aggregate total employer contribution rate due to the phased-in changes in the actuarial assumptions. [See page 29 of the valuation report]

Aggregate Total Employer Contribution Rate (June 30, 2018 Valuation)	**26.76%**
Effect of phase-in of change in employer's UAAL contribution rate impact due to changes in actuarial assumptions over three years	1.95%
Effect of actual contributions less than expected (due to phase-in)	0.29%
Effect of COLA increases higher than expected	0.26%
Effect of investment return less than expected (after smoothing)	0.06%
Effect of differences between expected and actual experience	0.12%
Aggregate Total Employer Contribution Rate (June 30, 2019 Valuation)	**29.44%**

Below are the aggregate total employer contribution rates by employer. [See pages 33-35 of the valuation report]

Aggregate Total Employer Contribution Rate			
Employer	**FY 2020-21**	**FY 2019-20**	**Change**
County of Sacramento	29.51%	26.75%	2.76%
Superior Court	25.73%	24.06%	1.67%
Special Districts	33.04%	31.05%	1.99%
All Employers Combined	29.44%	26.76%	2.68%

The aggregate total employer contribution rates are a combination of the normal cost rate and the UAAL rate across all member categories and benefit tiers. The contribution rate for Special District employers is higher due to a higher UAAL amortization payment, unlike the County and the Superior Court, Special District employers did not provide UAAL funding from pension obligation bonds in 2004 when benefit formulas were enhanced. Information regarding the UAAL amortization layers and amortization periods can be found on pages 72-74 of the valuation report.

Impact on Member Contribution Rates - The aggregate member contribution rate across all member categories and benefit tiers remains stable and reflects a decrease from 11.71% to 11.58% due to changes in membership demographics. [See page 9 of the valuation report] Information regarding the base (unadjusted) member contribution rates by plan and tier can be found on pages 99-113 of the valuation report.

Changes in Member Contribution Rates			
Benefit Tier	**FY 2020-21**	**FY 2019-20**	**Change**
Miscellaneous Tier 1	5.98%	5.91%	0.07%
Miscellaneous Tier 2	3.87%	3.87%	0.00%
Miscellaneous Tier 3	5.51%	5.54%	(0.03%)
Miscellaneous Tier 4	8.36%	8.37%	(0.01%)
Miscellaneous Tier 5	9.45%	9.45%	0.00%
Safety Tier 1	19.84%	19.49%	0.35%
Safety Tier 2	14.79%	14.77%	0.02%
Safety Tier 3	14.35%	14.33%	0.02%
Safety Tier 4	14.97%	15.09%	(0.12%)

<u>Effects of Pension Reform</u> – The impact of the County's and the State's pension reform measures are already being seen in the SCERS member workforce, and significant cost reduction resulting from these measures are projected to be realized in future years.

<u>Participation Levels</u> - Equally important to the lower cost of the new tiers is the transition of the workforce from participation levels in the legacy tiers versus participation levels in the Public Employees' Pension Reform Act (PEPRA) tiers. Below is a summary of active membership as of June 30, 2019 and 2018: [See pages 46 - 54 of the valuation report]

Active Membership				
Plan/Tier	**June 30, 2019**	**Percentage of Total Membership**	**June 30, 2018**	**Percentage of Total Membership**
Miscellaneous Tier 1	34	0.3%	46	0.4%
Miscellaneous Tier 2	45	0.4%	52	0.4%
Miscellaneous Tier 3	6,229	49.1%	6,701	52.9%
Miscellaneous Tier 4	342	2.7%	350	2.8%
Miscellaneous Tier 5	3,934	31.0%	3,437	27.1%
Safety Tier 1	96	0.8%	125	1.0%
Safety Tier 2	1,151	9.1%	1,214	9.6%
Safety Tier 3	118	0.9%	118	0.9%
Safety Tier 4	729	5.8%	634	5.0%
Total	**12,678**		**12,677**	

Currently, approximately 37% of the membership is in the new Miscellaneous and Safety tiers established by PEPRA. It is projected that within the next few years, 50% or more of the membership will be in the new tiers. Pension reform will continue to have a positive impact on employer normal cost for the next decade and beyond.

Ratio of Retired to Active Participants - As noted in previous valuation reports, the downsizing of the County workforce following the Great Financial Crisis, combined with an increased number of retirees and beneficiaries (primarily due to the Baby Boomer demographic) has impacted the ratio of non-active participants to active participants. Compared to 2010, when there were considerably more active participants than non-active participants (inactive vested members and retired members and beneficiaries), there are now 1.26 non-active participants for every active participant as of June 30, 2019. [See page 14 of the valuation report] While a steady increase in retirees and beneficiaries is expected to continue, there appears to be a small increase in the number of active SCERS members. However, the gap continues to widen between members drawing from the Plan and those paying into it. This creates sensitivity to our cash flow needs, which Staff continues to monitor. This dynamic also adds volatility to contribution rates should the Plan experience a loss.

Paying Down Unfunded Liability

Based on SCERS' funding plan, the outstanding Net UAAL balance of $2.192 billion as of June 30, 2019 is projected to be eliminated by year 2037, holding all assumptions constant. [See pages 75-76] Employer contributions should gradually increase through 2034 before dropping significantly as amortization tiers are paid off.

BACKGROUND

The annual actuarial valuation measures the current and projected assets and liabilities of SCERS, as well as the determination of SCERS' funded status. This information forms the basis for establishing the actuary's recommendations for the employer and member contribution rates for the upcoming fiscal year. The Board then uses the actuary's recommendations in adopting the appropriate contribution rates, which are conveyed to the Board of Supervisors for implementation.

In measuring the assets and liabilities, and determining SCERS' funded status, the actuary uses investment and actuarial experience to-date, plus various assumptions about the projected future growth in assets and liabilities. The actuarial assumptions include both economic and demographic assumptions, which are long term in nature, as opposed to the experience that might be anticipated in the next few years.

In each valuation, the previous year experience is compared to the actuarial assumptions, and to the extent there are differences, the contribution rates are adjusted. This is referred to as the "differences between expected and actual experience" and can result in either an upward or downward adjustment in the next year's contribution rate depending on whether the experience produced an "actuarial gain" or "actuarial loss." A review of demographic and economic assumptions is conducted as part of the triennial experience study.

The last triennial experience study prepared by Segal Consulting covered the period July 1, 2013 through June 30, 2016 and was presented for the Board's consideration in May 2017. At that time, the Board approved various actuarial assumptions which have been used in preparing the annual actuarial valuation as of June 30, 2017. The next experience study will cover the period of July 1, 2016 through June 30, 2019 and will be presented to the Board in 2020.

In determining appropriate contribution rates, the overall goal is to establish employer and member contribution rates which, together with investment earnings, will provide sufficient funding to pay the benefits earned by SCERS members. To accomplish this, the actuary identifies two cost components.

First, the actuary determines the contribution rate necessary to cover the “normal cost” of the retirement benefits. This is the amount which, when applied to the projected future compensation of the member, along with projected future investment earnings, will be sufficient to provide for the payment of the prospective benefits for the member as established under law. The normal cost is shared by the employer and employee, with the specific cost-sharing formula established either by statute or pursuant to collective bargaining or other labor agreements. With certain limitations, the cost-sharing burden can be modified by changes in those agreements.

Second, the actuary determines the contribution rate necessary to fund the portion of the ultimate benefit liability that has not been covered by previous normal cost contributions and investment returns. This cost component is referred to as the unfunded accrued actuarial liability (UAAL) rate and arises from several factors including actuarial losses, assumption changes, and investment under-performance.

GASB 67 ACTUARIAL VALUATION REPORT

Also attached is the GASB 67 Actuarial Valuation as of June 30, 2019 prepared by Segal Consulting.

GASB 67 redefined pension liability and expense for financial reporting purposes. When measuring pension liability, GASB uses the same actuarial cost method (Entry Age method) and the same type of discount rate (long-term expected rate of return on pension plan investments) as SCERS uses for funding. As a result, the Total Pension Liability measure for financial reporting purposes is determined on the same basis as SCERS’ Actuarial Accrued Liability measure for funding, which totals at $11.896 billion as of June 30, 2019.

The GASB 67 Valuation Report provides additional information related to the net pension liability, the changes in net pension liability, the discount rate used in determining the total pension liability, the sensitivity of net pension liability to changes in the discount rate, as well as other required note disclosures.

The information in this report will be incorporated into SCERS’ Comprehensive Annual Financial Report, which will be presented to the Board in December.

ATTACHMENTS

- Fiscal Years 2020-21 and 2019-20 Contribution Rate Schedules

- Actuarial Valuation and Review as of June 30, 2019
- Governmental Accounting Standards Board Statement 67
  Actuarial Valuation as of June 30, 2019

Prepared by:

/S/

Debbie Chan
Senior Accounting Manager

Reviewed by:

/S/

Eric Stern
Chief Executive Officer

FY 2020-21 and FY 2019-20 EMPLOYER CONTRIBUTION RATES

Sacramento County and Elected Officials

MISCELLANEOUS

	Tier 1		Tier 2		Tier 3		Tier 4		Tier 5	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
Normal Cost	10.52%	10.66%	7.66%	8.21%	10.69%	10.90%	10.40%	10.39%	9.45%	9.45%
UAAL	11.51%	9.53%	11.51%	9.53%	11.51%	9.53%	11.51%	9.53%	11.51%	9.53%
Total	**22.03%**	**20.19%**	**19.17%**	**17.74%**	**22.20%**	**20.43%**	**21.91%**	**19.92%**	**20.96%**	**18.98%**

SAFETY

	Tier 1		Tier 2		Tier 3		Tier 4	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
Normal Cost	27.40%	25.92%	19.37%	19.55%	18.73%	18.64%	14.97%	15.09%
UAAL	34.38%	28.76%	34.38%	28.76%	34.38%	28.76%	34.38%	28.76%
Total	**61.78%**	**54.68%**	**53.75%**	**48.31%**	**53.11%**	**47.40%**	**49.35%**	**43.85%**

Superior Court *

MISCELLANEOUS

	Tier 1		Tier 2		Tier 3		Tier 5	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
Normal Cost	13.50%	13.90%	11.44%	12.55%	15.54%	15.91%	9.45%	9.45%
UAAL	11.47%	9.50%	11.47%	9.50%	11.47%	9.50%	11.47%	9.50%
Total	**24.97%**	**23.40%**	**22.91%**	**22.05%**	**27.01%**	**25.41%**	**20.92%**	**18.95%**

Special Districts *

MISCELLANEOUS

Galt-Arno Cemetery and Fair Oaks Cemetery Districts

	Tier 3		Tier 5	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
Normal Cost	15.54%	15.91%	9.45%	9.45%
UAAL	14.10%	14.43%	14.10%	14.43%
Total	**29.64%**	**30.34%**	**23.55%**	**23.88%**

Orangevale Recreation and Park District

	Tier 3		Tier 5	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
Normal Cost	10.69%	10.90%	9.45%	9.45%
UAAL	18.64%	17.77%	18.64%	17.77%
Total	**29.33%**	**28.67%**	**28.09%**	**27.22%**

Rio Linda Elverta Recreation and Park District

	Tier 5	
	FY 2020-21	FY 2019-20
Normal Cost	9.45%	9.45%
UAAL	0.82%	0.36%
Total	**10.27%**	**9.81%**

All Other Special Districts

	Tier 1		Tier 3		Tier 5	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
Normal Cost	13.50%	13.90%	15.54%	15.91%	9.45%	9.45%
UAAL	18.64%	17.77%	18.64%	17.77%	18.64%	17.77%
Total	**32.14%**	**31.67%**	**34.18%**	**33.68%**	**28.09%**	**27.22%**

* Rates present pertain to the applicable Tiers for the respective employers.

FY 2020-21 and FY 2019-20 MEMBER CONTRIBUTION RATES

Sacramento County and Elected Officials

MISCELLANEOUS

	Tier 1*		Tier 2		Tier 3		Tier 4		Tier 5	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
All	9.58%	9.65%	7.80%	8.37%	10.60%	10.81%	10.29%	10.28%	9.45%	9.45%

SAFETY

	Tier 1*		Tier 2		Tier 3		Tier 4	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
All	22.40%	22.31%	19.24%	19.41%	18.68%	18.60%	14.97%	15.09%

Superior Court **

MISCELLANEOUS

	Tier 1*		Tier 2		Tier 3		Tier 5	
	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
All	5.98%	5.91%	3.87%	3.87%	5.51%	5.54%	9.45%	9.45%

Special Districts **

MISCELLANEOUS

Galt-Arno Cemetery and Fair Oaks Cemetery Districts

Tier 3		Tier 5	
FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
5.51%	5.54%	9.45%	9.45%

Orangevale Recreation and Park District

Tier 3		Tier 5	
FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
10.60%	10.81%	9.45%	9.45%

Rio Linda Elverta Recreation and Park District

Tier 5	
FY 2020-21	FY 2019-20
9.45%	9.45%

All Other Special Districts

Tier 1*		Tier 3		Tier 5	
FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20	FY 2020-21	FY 2019-20
5.98%	5.91%	5.51%	5.54%	9.45%	9.45%

Note: For legacy tiers (Miscellaneous tiers 1, 2, 3, and 4 and Safety tiers 1, 2, and 3), member rates shown are for bi-weekly salary in excess of $161 (or monthly salary in excess of $350). For PEPRA tiers (Miscellaneous tier 5 and Safety tier 4), member rates shown are for the total bi-weekly salary.

* Members who enter prior to 1/1/1975 contribute on the basis of their actual entry age and all others contribute based on the basis of a single entry age of 35 for Miscellaneous members and age of 29 for Safety members. The rates shown are for single entry age of 35 and entry age of 29 for Miscellaneous and Safety members, respectively.

** Rates present pertain to the applicable Tiers for the respective employers.

Sacramento County Employees' Retirement System

Actuarial Valuation and Review as of June 30, 2019

Segal Consulting

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November 5, 2019

Board of Retirement
Sacramento County Employees' Retirement System
980 9th Street, Suite 1900
Sacramento, CA 95814

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2019. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal year 2020-2021.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement System. The census information and financial information on which our calculations were based was prepared by the staff of the System. That assistance is gratefully acknowledged.

The actuarial calculations were directed under the supervision of Andy Yeung, ASA, MAAA, FCA and Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the System.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By:

Paul Angelo, FSA, EA, MAAA, FCA Senior Vice President and Actuary	Andy Yeung, ASA, EA, MAAA, FCA Vice President and Actuary	Molly Calcagno, ASA, EA, MAAA Assistant Actuary

Table of Contents

Sacramento County Employees' Retirement System Actuarial Valuation and Review as of June 30, 2019

Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal Consulting ("Segal") to present a valuation of the Sacramento County Employees' Retirement System ("SCERS" or "the System") as of June 30, 2019. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of current Plan assets to cover the estimated cost of settling the Plan's accrued benefit obligations.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the pension plan, as administered by the Board of Retirement;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of June 30, 2019, provided by SCERS;
- The assets of the Plan as of June 30, 2019, provided by SCERS;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The funding policy adopted by the Board of Retirement.

One of the general goals of an actuarial valuation is to establish contributions which fully fund the System's liabilities, and which, as a percentage of payroll, remain as level as possible for each generation of active members. Annual actuarial valuations measure the progress toward this goal, as well as test the adequacy of the contribution rates.

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to evaluate the System's liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by the System's staff. This information has not been audited by us, but it has been reviewed and found to be consistent, both internally and with prior year's information.

The contribution requirements are determined as a percentage of payroll. The System's employer rates provide for both Normal Cost and a contribution to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have applied the funding policy adopted by the Board on June 19, 2013. Details of the funding policy are provided in *Section 4, Exhibit I on pages 88 and 89*.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit H on pages 72 through 74*. A graphical projection of the Unfunded Actuarial Accrued Liability (UAAL) amortization balances and payments has been included in *Section 3, Exhibit I on pages 75 and 76.*

The rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2020 through June 30, 2021.

Significant Issues

Ref: Pg. 31

1. The Board adopted a three-year phase-in of the cost impact of the changes in actuarial assumptions calculated in the June 30, 2017 valuation on the employer's UAAL rate only. The employer should be aware that their contributions for 2020-2021 (that are established in this valuation) have increased again for the last year of the three-year phase-in of the cost impact of these changes in actuarial assumptions, including the interest cost associated with the phase-in. In this report, we have shown the rates for 2019-2020 (determined in the June 30, 2018 valuation) both before and after the phase-in.

Ref: Pgs. 27, 38

Ref: Pgs. 72-76

2. The ratio of the actuarial value of assets to actuarial accrued liabilities increased from 81.4% to 81.6%. On a market value of assets basis, the funded ratio increased from 82.5% to 82.6%. The System's UAAL increased from $2,090 million as of June 30, 2018 to $2,192 million as of June 30, 2019. A reconciliation of the System's UAAL is provided in *Section 2, Subsection E*. A schedule of the current UAAL amortization amounts is provided in *Section 3, Exhibit H*. Note that a graphical projection of the UAAL amortization base and payments has been provided in *Section 3, Exhibit I*.

Ref: Pg. 29

3. The aggregate employer rate increased from 26.76% of payroll (after second year of phase-in) to 29.44% of payroll (after third and final year of phase-in). The reasons for this change in contribution rate are: (i) recognizing another one-third of the cost impact of the changes in actuarial assumptions, (ii) lower than expected returns on investments (after "smoothing"), (iii) lower than expected contributions, (iv) higher UAAL rate due to lower than expected increase in total payroll, (v) higher than expected COLA increases for Tier 1, (vi) effect of retirement experience loss on actives, (vii) and other losses, offset to some degree by (viii) lower than expected individual salary increases during 2018-2019 and (ix) changes in membership demographics. A reconciliation of the System's aggregate employer rate is provided in *Section 2, Subsection F*.

Ref: Pg. 30

4. The aggregate member rate calculated in this valuation has decreased from 11.71% of payroll to 11.58% of payroll. The decrease in member rate is due to changes in membership demographics, offset to some extent by a reduction in the COLA offset. A reconciliation of the System's aggregate member rate is provided in *Section 2, Subsection F*.

5. As of June 30, 2019, about 37% of active members are enrolled in the CalPEPRA tiers. As a result of the implementation of the CalPEPRA tiers, the aggregate Normal Cost rate is lower by about 0.8% of payroll compared to what the aggregate Normal Cost rate would have been if the active members were enrolled in the legacy tiers.

Ref: Pg. 19

6. As indicated in *Section 2, Subsection B*, the total net unrecognized investment gain as of June 30, 2019 is $118.4 million (as compared to a net unrecognized investment gain of $128.9 million as of June 30, 2018). This net investment gain will be recognized in the determination of the actuarial value of assets for funding purposes over the next six years. That means that even if the System earns the assumed rate of investment return of 7.00% per year on a market value basis, there will still be net investment gains on the actuarial value of assets in the next few years. Therefore, if the actual market return is equal to the assumed rate of 7.00% and all the other actuarial assumptions are met, the net employer contribution requirements would decrease in the next few years.

The unrecognized investment gains represent about 1% of the market value of assets. Unless offset by future investment losses or other unfavorable experience, the recognition of the $118.4 million in past market gains is expected to have an impact on the System's future funded ratio and the aggregate employer contributions. This potential impact may be illustrated as follows:

a. If the deferred gains were recognized immediately in the actuarial value of assets, the funded percentage would increase from 81.6% to 82.6%.

   For comparison purposes, if all the deferred gains in the June 30, 2018 valuation had been recognized immediately in the June 30, 2018 valuation, the funded percentage would have increased from 81.4% to 82.5%.

b. If the deferred gains were recognized immediately in the actuarial value of assets, the aggregate employer contribution rate would decrease from 29.44% of payroll to 28.6% of payroll.

   For comparison purposes, if all the deferred gains in the June 30, 2018 valuation had been recognized immediately in the June 30, 2018 valuation, the aggregate employer contribution rate would have decreased from 26.85% of payroll to 25.9% of payroll. Note that both of these rates are calculated with the three-year phase-in of the UAAL rate impact from the assumption changes.

7. The $129.8 million in the Contingency Reserve as of June 30, 2019 is available to credit interest to the valuation reserve accounts or to offset actuarial losses in future valuations at the Board's discretion. If that amount were applied in the June 30, 2019 valuation, the aggregate employer contribution rate would have decreased by about 0.9% of payroll.

8. The actuarial valuation report as of June 30, 2019 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected. Declines in asset values will increase the actuarial cost of the plan, while increases will decrease the actuarial cost of the plan.

9. Rio Linda Elverta Recreation and Parks District became a participating employer effective October 1, 2017. Employees are enrolled in Miscellaneous Tier 5, regardless of any reciprocity with other retirement systems. Besides paying the Normal Cost rate, the employer is only responsible for its share of the UAAL rate based only on actuarial experience that occured on or after July 1, 2017.

Ref: Pg. 42

10. The Actuarial Standards Board approved a new Actuarial Standard of Practice No. 51 (ASOP 51) regarding risk assessment. ASOP 51 is effective with SCERS' June 30, 2019 actuarial valuation. ASOP 51 requires actuaries to identify risks that "may reasonably be anticipated to significantly affect the plan's future financial condition". Investment risk, asset/liability mismatch risk, interest rate risk, longevity and other demographic risks and contribution risk are also cited as examples in ASOP 51. The standard does not require the actuary to evaluate the likelihood of contributing entities to make contributions when due, nor does it require the actuary to assess the likelihood or consequences of future changes in applicable law.

The actuary's assessment can be qualitative or quantitative (e.g., based on numerical demonstrations). The actuary may use non-numerical methods for assessing risks that might take the form of commentary about potential adverse experience and the likely effect on future results. While the standard does not require that every valuation include a quantitative risk assessment, the actuary may recommend that a more detailed risk assessment be performed. When making that decision, the actuary will take into account such factors as the Plan's design, maturity, size, funded status, asset allocation, cash flow, possible insolvency and current market conditions.

SCERS has chosen early implementation of that ASOP effective with the June 30, 2018 actuarial valuation, including more detailed quantitative risk assessments in a stand-alone report. A copy of the stand-alone risk assessment report associated with this valuation, including the quantitative analyses recommended by Segal in consultation with SCERS staff, will be available in the first quarter of 2020.

Further information regarding ASOP 51 can be found in *Section 2, Subsection J*.

Summary of Key Valuation Results

		June 30, 2019		June 30, 2018 (After Phase-In)	
		Total Rate	Estimated Annual Dollar Amount[1] ($ in '000s)	Total Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Employer Contribution Rates:	• Miscellaneous Tier 1	22.58%	$648	20.73%	$595
	• Miscellaneous Tier 2	19.74%	678	18.43%	633
	• Miscellaneous Tier 3	23.07%	121,088	21.31%	111,845
	• Miscellaneous Tier 4	21.91%	6,647	19.92%	6,043
	• Miscellaneous Tier 5	21.35%	51,404	19.36%	46,609
	• Safety Tier 1	61.78%	8,789	54.68%	7,778
	• Safety Tier 2	53.75%	78,609	48.31%	70,653
	• Safety Tier 3	53.11%	7,213	47.40%	6,437
	• Safety Tier 4	49.35%	30,580	43.85%	27,173
	All Categories Combined	29.44%	$305,656	26.76%	$277,766
Aggregate Member Contribution Rates:	All Categories Combined	11.58%	$120,240	11.71%	$121,590
		Total Rate[2]	Per Member Annual Dollar Amount[3]	Total Rate[2]	Per Member Annual Dollar Amount[3]
Individual Member Contribution Rates:[4]	• Miscellaneous Tier 1	5.98%	$4,968	5.91%	$4,906
	• Miscellaneous Tier 2	3.87%	2,899	3.87%	2,899
	• Miscellaneous Tier 3	5.51%	4,569	5.54%	4,592
	• Miscellaneous Tier 4	8.36%	7,295	8.37%	7,304
	• Miscellaneous Tier 5	9.45%	5,783	9.45%	5,783
	• Safety Tier 1	19.84%	29,125	19.49%	28,613
	• Safety Tier 2	14.79%	18,591	14.77%	18,563
	• Safety Tier 3	14.35%	16,318	14.33%	16,297
	• Safety Tier 4	14.97%	12,725	15.09%	12,827

(1) Based on June 30, 2019 projected annual compensation.
(2) Based on single full-rates payable by members who enter on or after January 1, 1975.
(3) Based on June 30, 2019 average projected annual compensation for members in each respective tier.
(4) Before reflecting members in legacy tiers agreeing to contribute an additional portion of the Normal Cost.

Summary of Key Valuation Results (continued)

		June 30, 2019 ($ in '000s)	June 30, 2018 ($ in '000s)
Actuarial Accrued Liability as of June 30:	• Retired members and beneficiaries	$6,980,429	$6,475,230
	• Inactive vested members[1]	374,219	404,086
	• Active members	4,395,106	4,284,121
	• Non-valuation reserves and designations	145,766	49,826
	• Total Actuarial Accrued Liability[2]	11,895,520	11,213,263
	• Normal Cost for plan year beginning June 30	249,783	246,898
Assets as of June 30:	• Market Value of Assets (MVA)	$9,821,694	$9,251,937
	• Actuarial Value of Assets (AVA)[2]	$9,703,313	$9,123,004
Funded status as of June 30:	• Unfunded Actuarial Accrued Liability on Market Value of Assets basis	$2,073,826	$1,961,326
	• Funded percentage on MVA basis	82.6%	82.5%
	• Unfunded Actuarial Accrued Liability on Actuarial Value of Assets basis	$2,192,207	$2,090,259
	• Funded percentage on AVA basis	81.6%	81.4%
Key assumptions:	• Net investment return	7.00%	7.00%
	• Price inflation	3.00%	3.00%
	• Payroll growth	3.25%	3.25%

(1) Includes inactive members due a refund of member contributions.

(2) Includes non-valuation reserves and designations.

Summary of Key Valuation Results (continued)

		June 30, 2019	June 30, 2018	Change From Prior Year
Demographic data as of June 30:	**Active Members:**			
	• Number of members	12,678	12,677	0.0%
	• Average age	45.7	45.7	0.0
	• Average service	11.9	11.9	0.0
	• Total projected compensation	$1,038,340,908	$1,007,815,585	3.0%
	• Average projected compensation	$81,901	$79,500	3.0%
	Retired Members and Beneficiaries:			
	• Number of members:			
	– Service retired	10,001	9,547	4.8%
	– Disability retired	719	716	0.4%
	– Beneficiaries	1,661	1,620	2.5%
	– Total	12,381	11,883	4.2%
	• Average age	69.8	69.6	0.2
	• Average monthly benefit	$3,521	$3,381	4.1%
	Inactive Vested Members:			
	• Number of members[1]	3,602	3,509	2.7%
	• Average Age	47.0	47.4	-0.4
	Total Members:	28,661	28,069	2.1%

[1] Includes inactive members due a refund of member contributions.

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal Consulting ("Segal") relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the Market Value of Assets as of the valuation date, as provided by the System. The System uses "Valuation Value of Assets" that differs from market value to gradually reflect year-to-year changes in the Market Value of Assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the System. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:
  - Differences between actual experience and anticipated experience;
  - Changes in actuarial assumptions or methods; and
  - Changes in statutory provisions.
- If the System is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The System should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

A. Member Data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive vested members, retired members and beneficiaries.

This section presents a summary of significant statistical data on these member groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B, and C*.

MEMBER POPULATION: 2010 – 2019

Year Ended June 30	Active Members	Inactive Vested Members[1]	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2010	13,340	2,740	8,346	11,086	0.83	0.63
2011	12,434	2,710	8,821	11,531	0.93	0.71
2012	12,155	2,851	9,239	12,090	0.99	0.76
2013	12,026	3,249	9,634	12,883	1.07	0.80
2014	12,049	3,201	10,049	13,250	1.10	0.83
2015	12,072	3,261	10,541	13,802	1.14	0.87
2016	12,393	3,301	10,960	14,261	1.15	0.88
2017	12,587	3,425	11,396	14,821	1.18	0.91
2018	12,677	3,509	11,883	15,392	1.21	0.94
2019	12,678	3,602	12,381	15,983	1.26	0.98

[1] Includes inactive members due a refund of member contributions.

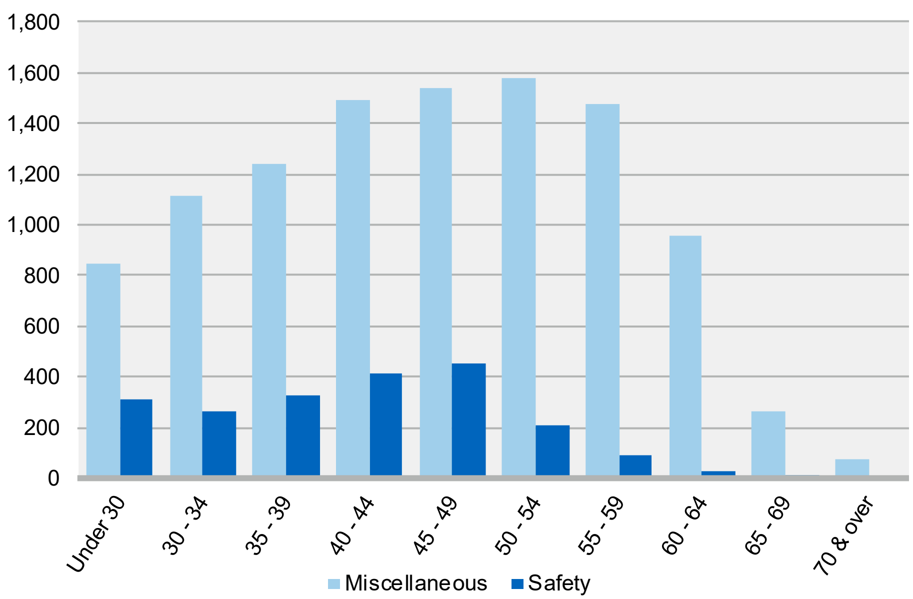
Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 12,678 active members with an average age of 45.7, average years of service of 11.9 years and average compensation of $81,901. The 12,677 active members in the prior valuation had an average age of 45.7, average service of 11.9 years and average compensation of $79,500.

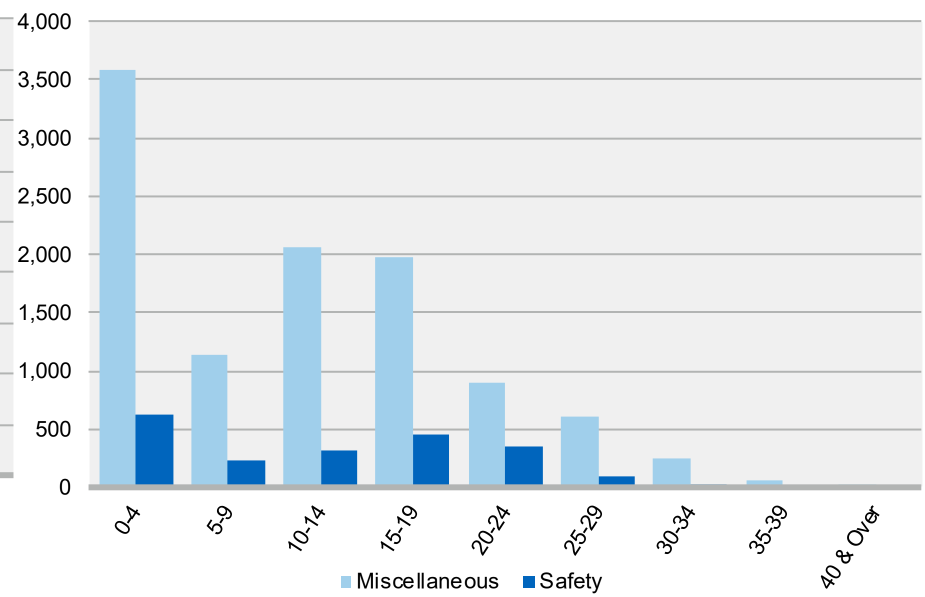
Among the active members, there were none with unknown age information.

Distribution of Active Participants as of June 30, 2019

ACTIVES BY AGE



ACTIVES BY YEARS OF SERVICE



Inactive Members

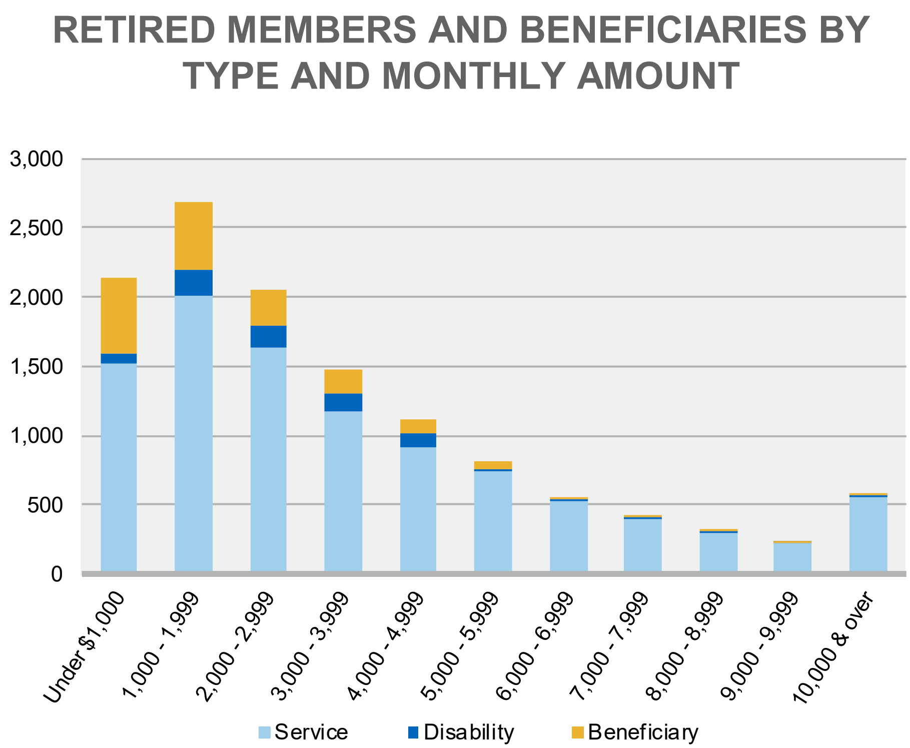
In this year's valuation, there were 3,602 members with a vested right to a deferred or immediate vested benefit or entitled to a return of their member contributions versus 3,509 in the prior valuation.

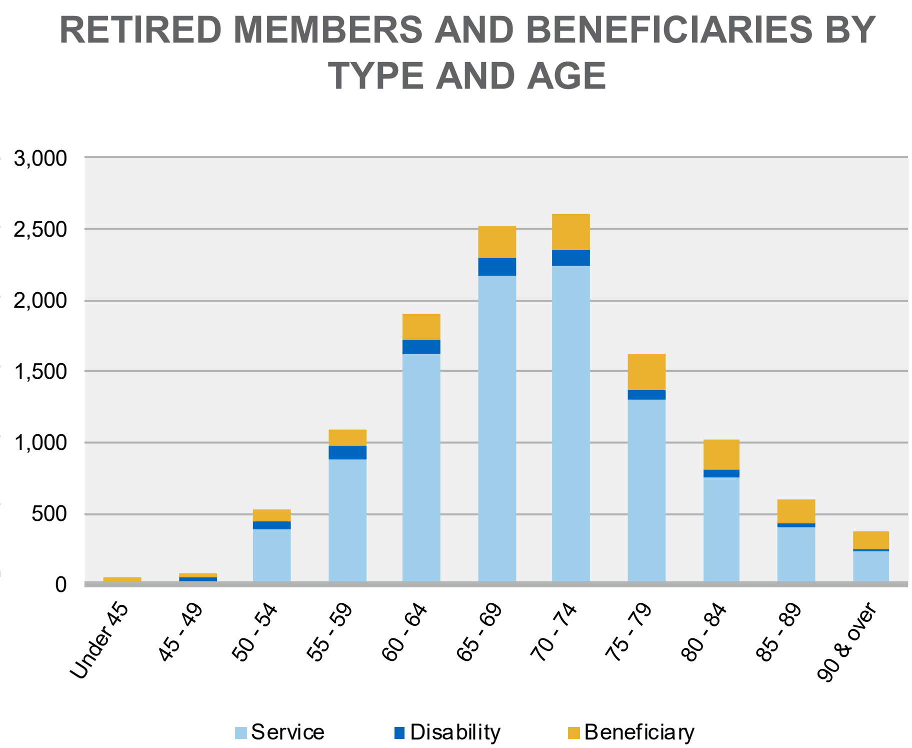
Retired Members and Beneficiaries

As of June 30, 2019, 10,720 retired members and 1,661 beneficiaries were receiving total monthly benefits of $43,599,217. For comparison, in the previous valuation, there were 10,263 retired members and 1,620 beneficiaries receiving monthly benefits of $40,179,742.

As of June 30, 2019, the average monthly benefit for retired members and beneficiaries is $3,521, compared to $3,381 in the previous valuation. The average age for retired members and beneficiaries is 69.8 in the current valuation, compared with 69.6 in the prior valuation.

Distribution of Retired Members and Beneficiaries as of June 30, 2019





Historical Plan Population

The chart below demonstrates the progression of the active population over the last ten years. The chart also shows the growth among the retired population over the same time period.

MEMBER STATISTICS: 2010 – 2019

	Active Participants			Retired Members and Beneficiaries		
Year Ended June 30	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2010	13,340	45.8	11.4	8,346	68.6	$2,588
2011	12,434	46.4	12.1	8,821	68.7	2,683
2012	12,155	46.8	12.6	9,239	68.8	2,780
2013	12,026	47.0	12.9	9,634	69.0	2,865
2014	12,049	46.9	12.8	10,049	69.1	2,950
2015	12,072	46.7	12.7	10,541	69.2	3,072
2016	12,393	46.3	12.4	10,960	69.4	3,156
2017	12,587	46.0	12.1	11,396	69.5	3,260
2018	12,677	45.7	11.9	11,883	69.6	3,381
2019	12,678	45.7	11.9	12,381	69.8	3,521

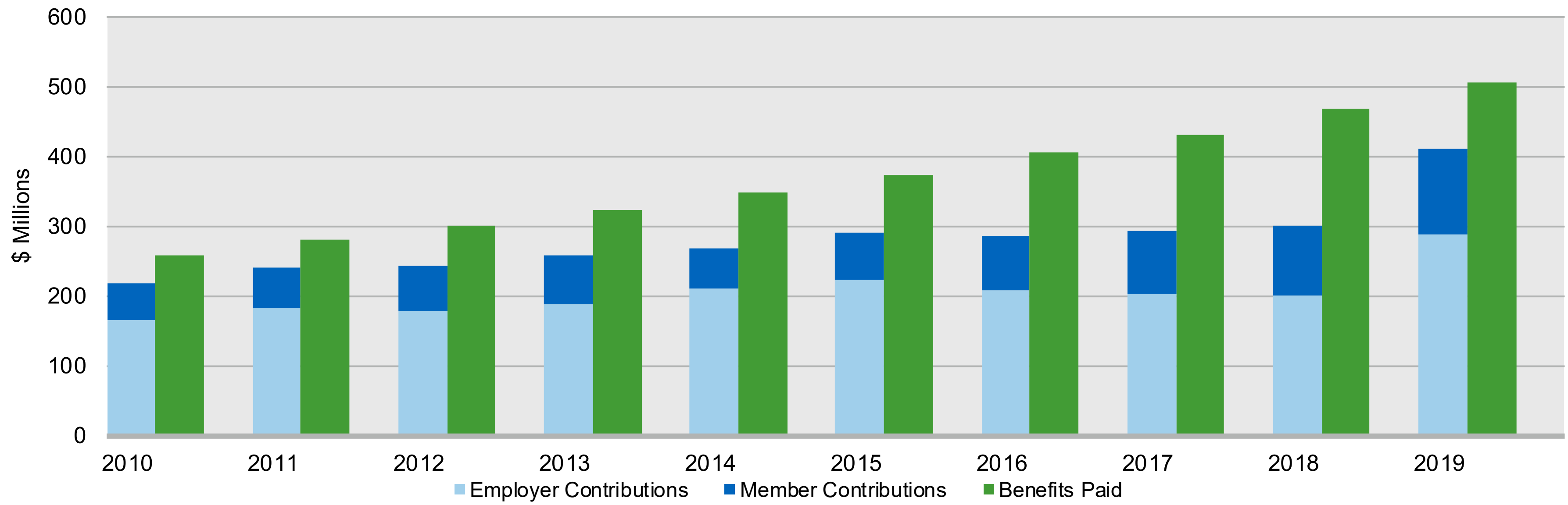
B. Financial Information

Retirement plan funding anticipates that, over the long term, both contributions and investment earnings (less investment fees and administrative expenses) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of transactions for the valuation year, is presented in *Section 3, Exhibits D, E, F and G*.

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the valuation asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

COMPARISON OF CONTRIBUTIONS WITH BENEFITS AND EXPENSES FOR YEARS ENDED JUNE 30, 2010 – 2019



DETERMINATION OF ACTUARIAL VALUE OF ASSETS

		Expected Return	Actual Return	Original Amount	Percent Deferred	Unrecognized Amount
1	Market Value of Assets					$9,821,694,000
2	Calculation of unrecognized return					
a)	Year ended June 30, 2014	$512,153,604	$1,101,487,307	$589,333,703	14.3%	$84,190,529
b)	Year ended June 30, 2015	589,233,282	152,368,245	(436,865,037)	28.6%	(124,818,582)
c)	Year ended June 30, 2016	592,506,256	(78,760,809)	(671,267,065)	42.9%	(287,685,885)
d)	Year ended June 30, 2017	576,748,382	1,042,009,164	465,260,782	57.1%	265,863,304
e)	Year ended June 30, 2018	600,381,878	834,483,764	234,101,886	71.4%	167,215,633
f)	Year ended June 30, 2019	649,300,474	665,185,884	15,885,410	85.7%	13,616,065
g)	Total unrecognized return(1)					$118,381,064
3	Preliminary Actuarial Value of Assets 1 – 2g					$9,703,312,936
4	Adjustment to be within 30% corridor					0
5	Final Actuarial Value of Assets 3 + 4					$9,703,312,936
6	Actuarial Value of Assets as a percentage of Market Value of Assets					98.8%
7	Non-valuation reserves and designations:					
a)	Contingency Reserve					$129,814,743
b)	Other Non-Valuation Reserves					0
c)	Subtotal					$129,814,743
8	Preliminary Valuation Value of Assets 5 – 7c					$9,573,498,193
9	Adjustment to Preliminary Valuation Value of Assets(2)					
a)	Balance of transfer to offset member COLA rate					$15,951,000
b)	Subtotal					$15,951,000
10	Final Valuation Value of Assets 8 – 9b					$9,557,547,193

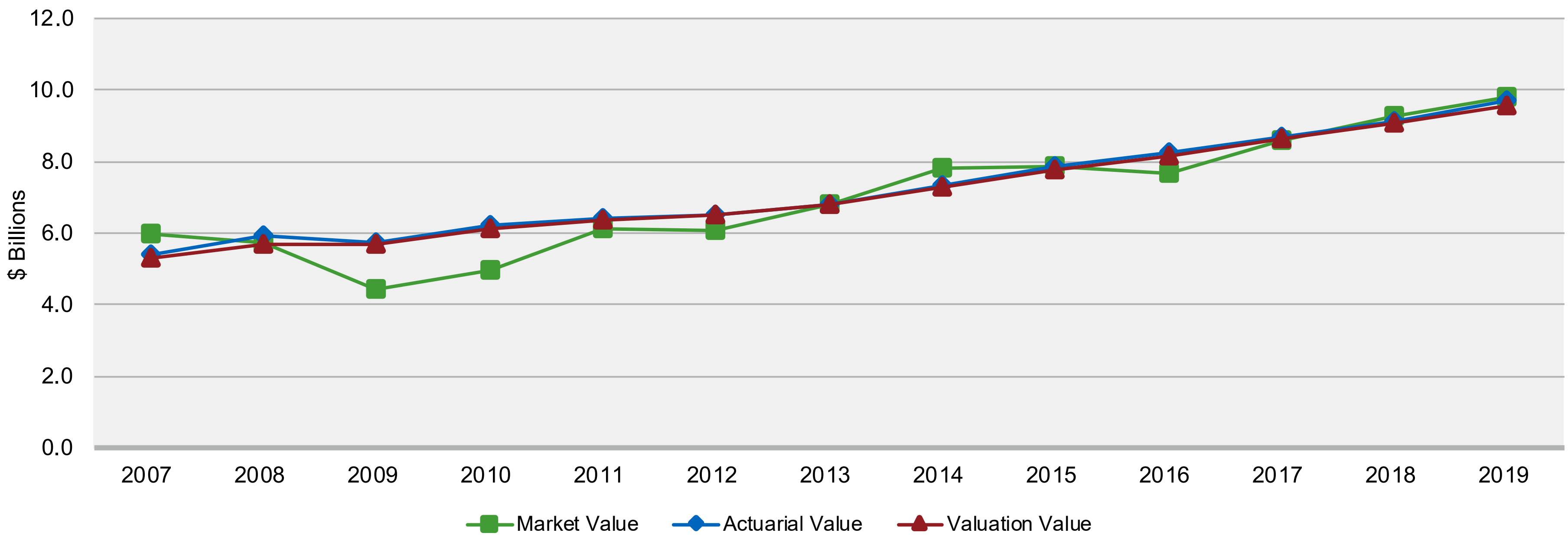
(1) Deferred return as of June 30, 2019 recognized in each of the next six years:

(a) Amount recognized on June 30, 2020	$28,064,240
(b) Amount recognized on June 30, 2021	(56,126,289)
(c) Amount recognized on June 30, 2022	6,283,002
(d) Amount recognized on June 30, 2023	102,178,296
(e) Amount recognized on June 30, 2024	35,712,470
(f) Amount recognized on June 30, 2025	2,269,345
(g) Total unrecognized return as of June 30, 2019	$118,381,064

(2) In prior valuations, an adjustment was made to increase the Valuation Value of Assets to account for the contributions that we would expect to receive from a withdrawn employer to pay off its unfunded liability. That adjustment is no longer required because SCERS has included a comparable amount as a receivable contribution on its financial statements starting with this valuation.

The Market Value, Actuarial Value and Valuation Value of Assets are representations of the Plan's financial status. As investment gains and losses are gradually taken into account, the Actuarial Value of Assets tracks the Market Value of Assets. The Valuation Value of Assets is generally the actuarial value, excluding any non-valuation reserves. The Valuation Value of Assets is significant because the Plan's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the Unfunded Actuarial Accrued Liability is an important element in determining the contribution requirement.

MARKET VALUE, ACTUARIAL VALUE, AND VALUATION VALUE OF ASSETS AS OF JUNE 30, 2007 – 2019



C. Actuarial Experience

To calculate any actuarially determined contribution, 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 measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the actuarially determined contribution will decrease from the previous year. On the other hand, the actuarially determined contribution will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years. There are no assumption changes reflected in this report.

The total loss is $122.7 million, which includes $8.4 million from investment losses, a loss of $42.0 million from contribution experience and $72.2 in losses from all other sources. The net experience variation from individual sources other than investments and contributions was 0.6% of the Actuarial Accrued Liability. A discussion of the major components of the actuarial experience is on the following pages.

ACTUARIAL EXPERIENCE FOR YEAR ENDED JUNE 30, 2019

1	Net loss from investments[1]	$(8,439,000)
2	Net loss from contribution experience	(42,021,000)
3	Net loss from other experience[2]	(72,244,000)
4	Net experience loss: 1 + 2 + 3	$(122,704,000)

[1] Details on next page.

[2] See *Subsection E* for further details. Does not include the effect of plan or assumption changes, if any.

Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the Market Value of Assets was 7.17% for the year ended June 30, 2019.

For valuation purposes, the assumed rate of return on the Valuation Value of Assets is 7.00%. The actual rate of return on a valuation basis for the 2018-2019 plan year was 6.91%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended June 30, 2019 with regard to its investments.

INVESTMENT EXPERIENCE FOR YEAR ENDED JUNE 30, 2019

		Market Value	Actuarial Value	Valuation Value
1	Net investment income	$665,186,000	$675,738,000	$628,142,000
2	Average value of assets	9,275,721,000	9,146,788,000	9,094,009,000
3	Rate of return: 1 ÷ 2	7.17%	7.39%	6.91%
4	Assumed rate of return	7.00%	7.00%	7.00%
5	Expected investment income: 2 x 4	$649,300,000	$640,275,000	$636,581,000
6	Actuarial gain/(loss): 1 – 5	$15,886,000	$35,463,000	$(8,439,000)

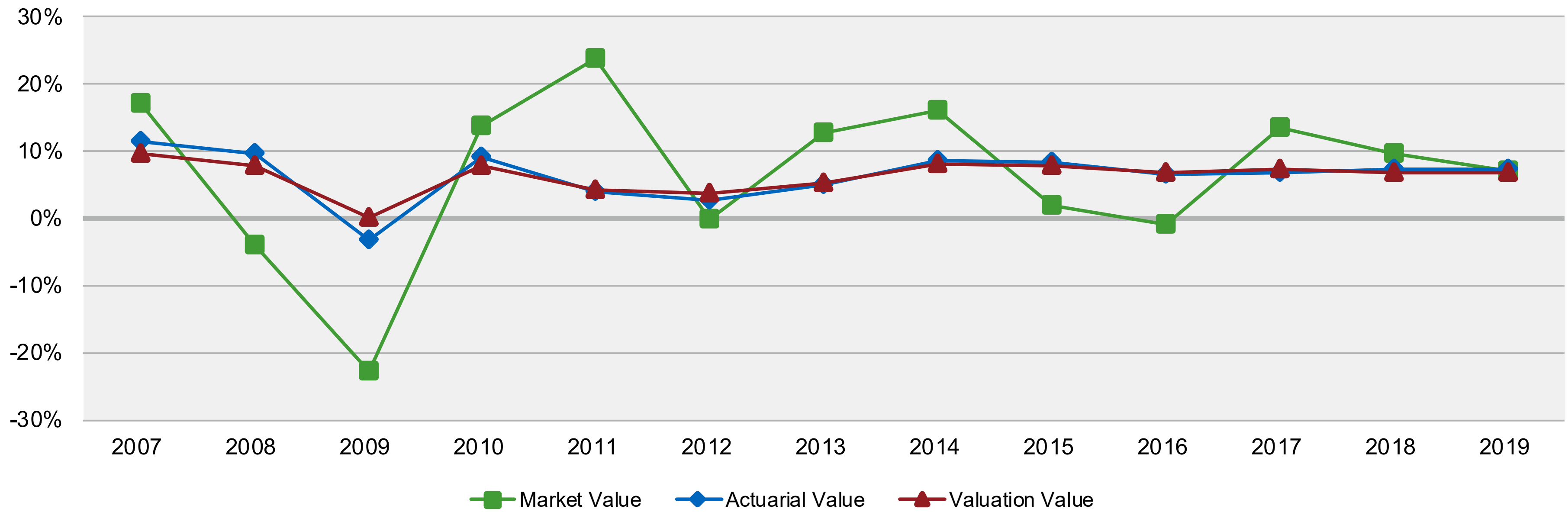
Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial and valuation basis compared to the actual market value investment return for the last ten years, including averages over select time periods.

INVESTMENT RETURN – MARKET VALUE, ACTUARIAL VALUE AND VALUATION VALUE: 2010 – 2019

Year Ended June 30	Market Value Investment Return		Actuarial Value Investment Return		Valuation Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent
2010	$611,573,000	13.71%	$525,248,000	9.08%	$450,949,000	7.83%
2011	1,200,204,000	23.81%	244,352,000	3.89%	269,937,000	4.37%
2012	(9,702,000)	(0.16%)	166,087,000	2.57%	238,467,000	3.73%
2013	779,729,000	12.73%	333,523,000	5.07%	341,373,000	5.19%
2014	1,101,488,000	16.13%	594,718,000	8.70%	551,884,000	8.06%
2015	152,368,000	1.94%	609,387,000	8.28%	572,950,000	7.82%
2016	(78,761,000)	(1.00%)	516,765,000	6.57%	521,978,000	6.70%
2017	1,042,009,000	13.55%	567,473,000	6.88%	610,522,000	7.46%
2018	834,484,000	9.73%	624,550,000	7.21%	598,171,000	6.93%
2019	665,186,000	7.17%	675,738,000	7.39%	628,142,000	6.91%
Most recent five-year geometric average return		6.15%		7.27%		7.16%
Most recent ten-year geometric average return		9.51%		6.55%		6.49%

Subsection B described the actuarial asset valuation method that gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

MARKET, ACTUARIAL AND VALUATION RATES OF RETURN FOR YEARS ENDED JUNE 30, 2007 – 2019



Contributions

Contributions for the year ended June 30, 2019 totaled $362.1 million (excluding $48.3 million in receivable and actual contributions made by a withdrawn employer required to pay off its unfunded liability), compared to the projected amount of $409.0 million. This resulted in a loss of $42.0 million for the year, when adjusted for timing. These exclude any contributions for withdrawn employers, if any.

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among participants,
- retirement experience (earlier or later than projected),
- mortality (more or fewer deaths than projected),
- the number of disability retirements (more or fewer than projected),
- salary increases (greater or smaller than projected), and
- cost-of-living adjustments (COLAs) higher or lower than anticipated.

The net loss from this other experience for the year ended June 30, 2019 amounted to $72.2 million, which is 0.6% of the Actuarial Accrued Liability. See *Subsection E* for a detailed development of the Unfunded Actuarial Accrued Liability.

D. Other Changes in the Actuarial Accrued Liability

The Actuarial Accrued Liability as of June 30, 2019 is $11.9 billion, an increase of $0.7 billion, or 6.1%, from the Actuarial Accrued Liability as of the prior valuation date. The liability is expected to grow each year with Normal Cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (as discussed in the previous subsection).

Actuarial Assumptions

- There are no assumption changes reflected in this report.
- Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan Provisions

- There were no changes in plan provisions since the prior valuation.
- A summary of plan provisions is in *Section 4, Exhibit II*.

E. Development of Unfunded Actuarial Accrued Liability

DEVELOPMENT FOR YEAR ENDED JUNE 30, 2019

1	Unfunded Actuarial Accrued Liability at beginning of year		$2,090,259,000
2	Total Normal Cost at middle of year		246,898,000
3	Expected employer and member contributions[1]		(408,951,000)
4	Interest		141,297,000
5	Expected Unfunded Actuarial Accrued Liability at end of year		$2,069,503,000
6	Changes due to:		
	a) Investment return less than expected (after "smoothing")	$8,439,000	
	b) Actual contributions less than expected[1],[2]	42,021,000	
	c) Individual salary increases lower than expected	(24,166,000)	
	d) COLA increases higher than expected	37,550,000	
	e) Retirement experience loss on actives	51,761,000	
	f) Other experience loss	7,099,000	
	Total changes		$122,704,000
7	Unfunded Actuarial Accrued Liability at end of year		$2,192,207,000

Note: The sum of items 6c through 6f equals the "Net loss from other experience" shown in *Subsection C*.

[1] Contribution from Sacramento Metropolitan Fire District is excluded from both the expected and the actual contributions.

[2] Due to the one-year lag in implementation of the contribution rates determined in the June 30, 2018 valuation and the phase-in of the cost impact of the changes in actuarial assumptions calculated in the June 30, 2017 valuation on the employer's UAAL rate.

F. Recommended Contribution

The recommended contribution is equal to the employer Normal Cost payment and a payment on the Unfunded Actuarial Accrued Liability. As of June 30, 2019, the average recommended employer contribution is 29.44% of compensation.

The Board sets the funding policy used to calculate the recommended contribution based on layered amortization periods. See *Section 4, Exhibit I* for further details on the funding policy.

The contribution requirement as of June 30, 2019 is based on the data previously described, the actuarial assumptions and Plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

AVERAGE RECOMMENDED EMPLOYER CONTRIBUTION FOR YEAR ENDING JUNE 30

All Tiers Combined		2019		2018	
		Amount ($ in '000s)	% of Projected Compensation	Amount ($ in '000s)	% of Projected Compensation
1	Total Normal Cost	$249,783	24.06%	$246,898	24.49%
2	Expected member Normal Cost contributions	(120,240)	(11.58%)	(118,620)	(11.77%)
3	Employer Normal Cost: 1 + 2	$129,543	12.48%	$128,278	12.72%
4	Actuarial Accrued Liability(1)	11,749,754		11,163,437	
5	Valuation Value of Assets(1)	9,557,547		9,073,178	
6	Unfunded Actuarial Accrued Liability: 4 - 5	$2,192,207		$2,090,259	
7	Payment on Unfunded Actuarial Accrued Liability	$176,113	16.96%	$162,053	16.08%
8	Total average recommended employer contribution: 3 + 7	$305,656	29.44%	$290,331	28.80%
9	Projected compensation	$1,038,341		$1,007,815	

Note: Contributions are assumed to be paid at the middle of the year.

(1) Excludes non-valuation reserves and designations.

Reconciliation of Average Recommended Employer Contribution Rate

The chart below details the changes in the average recommended employer contribution from the prior valuation to the current year's valuation.

RECONCILIATION OF AVERAGE RECOMMENDED EMPLOYER CONTRIBUTION RATE FROM JUNE 30, 2018 TO JUNE 30, 2019

	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Recommended Employer Contribution as of June 30, 2018 (After Reflecting Three-Year Phase-In and Additional Normal Cost by Certain Legacy members for 2019-2020)	26.76%	$277,766
Effect of phase-in of change employer's UAAL contribution rate impact due to changes in actuarial assumptions over three years	1.95%	20,292
Average Recommended Employer Contribution Rate as of June 30, 2018 (Before Reflecting Three-Year Phase-In)	28.71%	$298,058
• Effect of investment return less than expected (after "smoothing")	0.06%	623
• Effect of actual contributions less than expected	0.29%	3,011
• Effect of individual salary increases lower than expected	(0.17%)	(1,765)
• Effect of increase in UAAL rate from lower than expected increase in total payroll	0.03%	312
• Effect of COLA increases higher than expected	0.26%	2,700
• Effect of retirement experience loss on actives	0.36%	3,738
• Effect of changes in member demographics	(0.13%)	(1,338)
• Effect of other losses	0.03%	317
Total change	0.73%	$7,598
Average Recommended Employer Contribution as of June 30, 2019	29.44%	$305,656

[1] Based on June 30, 2019 projected compensation.

Reconciliation of Average Recommended Member Contribution

The chart below details the changes in the average recommended member contribution from the prior valuation to the current year's valuation.

RECONCILIATION OF AVERAGE RECOMMENDED MEMBER CONTRIBUTION FROM JUNE 30, 2018 TO JUNE 30, 2019

	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Recommended Member Contribution as of June 30, 2018	11.71%	$121,590
• Effect of changes in member demographics	(0.15%)	(1,558)
• Effect of reduction in COLA offset	0.02%	208
Total change	(0.13%)	$(1,350)
Average Recommended Member Contribution as of June 30, 2019	11.58%	$120,240

(1) Based on June 30, 2019 projected compensation.

Recommended Employer Contribution Rates

County Only[1]	June 30, 2019 Actuarial Valuation		June 30, 2018 Actuarial Valuation	
	Contribution Rate	Estimated Annual Dollar Amount[2] ($ in '000s)	Contribution Rate	Estimated Annual Dollar Amount[2] ($ in '000s)
Miscellaneous – Tier 1 Members				
Normal Cost	10.52%	$265	10.66%	$268
UAAL	11.51%	290	10.95%	276
Total Contribution	22.03%	$555	21.61%	$544
Total Contribution after 3-year Phase-In			20.19%	$508
Miscellaneous – Tier 2 Members				
Normal Cost	7.66%	$221	8.21%	$237
UAAL	11.51%	332	10.95%	316
Total Contribution	19.17%	$553	19.16%	$553
Total Contribution after 3-year Phase-In			17.74%	$512
Miscellaneous – Tier 3 Members				
Normal Cost	10.69%	$49,724	10.90%	$50,700
UAAL	11.51%	53,538	10.95%	50,933
Total Contribution	22.20%	$103,262	21.85%	$101,633
Total Contribution after 3-year Phase-In			20.43%	$95,028
Miscellaneous – Tier 4 Members				
Normal Cost	10.40%	$3,155	10.39%	$3,152
UAAL	11.51%	3,492	10.95%	3,322
Total Contribution	21.91%	$6,647	21.34%	$6,474
Total Contribution after 3-year Phase-In			19.92%	$6,043
Miscellaneous – Tier 5 Members				
Normal Cost	9.45%	$20,705	9.45%	$20,705
UAAL	11.51%	25,218	10.95%	23,991
Total Contribution	20.96%	$45,923	20.40%	$44,696
Total Contribution after 3-year Phase-In			18.98%	$41,585

(1) Includes elected officials (Board of Supervisors, Sheriff, District Attorney and Assessor).

(2) Based on June 30, 2019 projected annual payroll, see page 36.

Recommended Employer Contribution Rates (continued)

County Only[1] (continued)	June 30, 2019 Actuarial Valuation Contribution Rate	June 30, 2019 Actuarial Valuation Estimated Annual Dollar Amount[2] ($ in '000s)	June 30, 2018 Actuarial Valuation Contribution Rate	June 30, 2018 Actuarial Valuation Estimated Annual Dollar Amount[2] ($ in '000s)
All Miscellaneous County Categories Combined				
Normal Cost	10.29%	$74,070	10.42%	$75,062
UAAL	11.51%	82,870	10.95%	78,838
Total Contribution	21.80%	$156,940	21.37%	$153,900
Total Contribution after 3-year Phase-In			19.96%	$143,676
Safety – Tier 1 Members				
Normal Cost[3]	27.40%	$3,898	25.92%	$3,687
UAAL	34.38%	4,891	32.54%	4,629
Total Contribution	61.78%	$8,789	58.46%	$8,316
Total Contribution after 3-year Phase-In			54.68%	$7,778
Safety – Tier 2 Members				
Normal Cost	19.37%	$28,329	19.55%	$28,592
UAAL	34.38%	50,280	32.54%	47,589
Total Contribution	53.75%	$78,609	52.09%	$76,181
Total Contribution after 3-year Phase-In			48.31%	$70,653
Safety – Tier 3 Members				
Normal Cost	18.73%	$2,544	18.64%	$2,531
UAAL	34.38%	4,669	32.54%	4,420
Total Contribution	53.11%	$7,213	51.18%	$6,951
Total Contribution after 3-year Phase-In			47.40%	$6,437
Safety – Tier 4 Members				
Normal Cost	14.97%	$9,276	15.09%	$9,351
UAAL	34.38%	21,304	32.54%	20,164
Total Contribution	49.35%	$30,580	47.63%	$29,515
Total Contribution after 3-year Phase-In			43.85%	$27,173

(1) Includes elected officials (Board of Supervisors, Sheriff, District Attorney and Assessor).

(2) Based on June 30, 2019 projected annual payroll, see page 36.

(3) The increase in the Normal Cost rate is primarily due to the adjustment to the employer rate to account for the cost associated with the cessation of member contributions after 30 years of service increasing from 2.11% of payroll as of June 30, 2018 to 3.26% of payroll as of June 30, 2019.

Recommended Employer Contribution Rates (continued)

County Only[1] (continued)	June 30, 2019 Actuarial Valuation Contribution Rate	June 30, 2019 Actuarial Valuation Estimated Annual Dollar Amount[2] ($ in '000s)	June 30, 2018 Actuarial Valuation Contribution Rate	June 30, 2018 Actuarial Valuation Estimated Annual Dollar Amount[2] ($ in '000s)
All Safety County Categories Combined				
Normal Cost	18.66%	$44,047	18.71%	$44,161
UAAL	34.38%	81,144	32.54%	76,802
Total Contribution	53.04%	$125,191	51.25%	$120,963
Total Contribution after 3-year Phase-In			47.47%	$112,041
All County Categories Combined				
Normal Cost	12.35%	$118,117	12.47%	$119,223
UAAL	17.16%	164,014	16.28%	155,640
Total Contribution	29.51%	$282,131	28.75%	$274,863
Total Contribution after 3-year Phase-In			26.75%	$255,717

(1) Includes elected officials (Board of Supervisors, Sheriff, District Attorney and Assessor).

(2) Based on June 30, 2019 projected annual payroll, see page 36.

Recommended Employer Contribution Rates (continued)

Superior Court Only	June 30, 2019 Actuarial Valuation Contribution Rate	June 30, 2019 Actuarial Valuation Estimated Annual Dollar Amount[1] ($ in '000s)	June 30, 2018 Actuarial Valuation Contribution Rate	June 30, 2018 Actuarial Valuation Estimated Annual Dollar Amount[1] ($ in '000s)
Miscellaneous – Tier 1 Members				
Normal Cost	13.50%	$40	13.90%	$41
UAAL	11.47%	34	10.92%	32
Total Contribution	24.97%	$74	24.82%	$73
Total Contribution after 3-year Phase-In			23.40%	$69
Miscellaneous – Tier 2 Members				
Normal Cost	11.44%	$62	12.55%	$69
UAAL	11.47%	63	10.92%	60
Total Contribution	22.91%	$125	23.47%	$129
Total Contribution after 3-year Phase-In			22.05%	$121
Miscellaneous – Tier 3 Members				
Normal Cost	15.54%	$6,115	15.91%	$6,260
UAAL	11.47%	4,513	10.92%	4,297
Total Contribution	27.01%	$10,628	26.83%	$10,557
Total Contribution after 3-year Phase-In			25.41%	$9,998
Miscellaneous – Tier 5 Members				
Normal Cost	9.45%	$957	9.45%	$957
UAAL	11.47%	1,161	10.92%	1,105
Total Contribution	20.92%	$2,118	20.37%	$2,062
Total Contribution after 3-year Phase-In			18.95%	$1,919
All Superior Court Categories Combined				
Normal Cost	14.26%	$7,174	14.56%	$7,327
UAAL	11.47%	5,771	10.92%	5,494
Total Contribution	25.73%	$12,945	25.48%	$12,821
Total Contribution after 3-year Phase-In			24.06%	$12,107

(1) Based on June 30, 2019 projected annual payroll, see page 36.

Recommended Employer Contribution Rates (continued)

District Only	June 30, 2019 Actuarial Valuation Contribution Rate	June 30, 2019 Actuarial Valuation Estimated Annual Dollar Amount[1] ($ in '000s)	June 30, 2018 Actuarial Valuation Contribution Rate	June 30, 2018 Actuarial Valuation Estimated Annual Dollar Amount[1] ($ in '000s)
Miscellaneous – Tier 1 Members				
Normal Cost	13.50%	$8	13.90%	$8
UAAL[2]	19.76%	11	18.87%	11
Total Contribution	33.26%	$19	32.77%	$19
Total Contribution after 3-year Phase-In			31.42%	$18
Miscellaneous – Tier 3 Members				
Normal Cost	15.43%	$3,156	15.81%	$3,235
UAAL[2]	19.76%	4,042	18.87%	3,860
Total Contribution	35.19%	$7,198	34.68%	$7,095
Total Contribution after 3-year Phase-In			33.33%	$6,819
Miscellaneous – Tier 5 Members				
Normal Cost	9.45%	$1,088	9.45%	$1,088
UAAL[2]	19.76%	2,275	18.87%	2,172
Total Contribution	29.21%	$3,363	28.32%	$3,260
Total Contribution after 3-year Phase-In			26.97%	$3,105
All District Categories Combined				
Normal Cost	13.28%	$4,252	13.53%	$4,331
UAAL[2]	19.76%	6,328	18.87%	6,043
Total Contribution	33.04%	$10,580	32.40%	$10,374
Total Contribution after 3-year Phase-In			31.05%	$9,942
All County and District Categories Combined				
Normal Cost	12.48%	$129,543	12.61%	$130,881
UAAL	16.96%	176,113	16.10%	167,177
Total Contribution	29.44%	$305,656	28.71%	$298,058
Total Contribution after 3-year Phase-In			26.76%	$277,766

(1) Based on June 30, 2019 projected annual payroll, see page 36.

(2) See *Section 4, Exhibit IV* for the development of additional District UAAL rates and see *Section 4, Exhibit V* for the detailed District UAAL rates.

Recommended Employer Contribution Rates (continued)

The following June 30, 2019 projected annual payroll is used in developing employer contribution rates on the four previous pages:

	County[1]	Superior Court	District	Total
Miscellaneous Tier 1	$2,516	$297	$57	$2,870
Miscellaneous Tier 2	2,888	546	0	3,434
Miscellaneous Tier 3	465,141	39,348	20,456	524,945
Miscellaneous Tier 4	30,338	0	0	30,338
Miscellaneous Tier 5	219,098	10,122	11,511	240,731
Subtotal	**$719,981**	**$50,313**	**$32,024**	**$802,318**
Safety Tier 1	$14,225	$0	$0	$14,225
Safety Tier 2	146,249	0	0	146,249
Safety Tier 3	13,582	0	0	13,582
Safety Tier 4	61,967	0	0	61,967
Subtotal	**$236,023**	**$0**	**$0**	**$236,023**
Total	**$956,004**	**$50,313**	**$32,024**	**$1,038,341**

[1] Includes elected officials (Board of Supervisors, Sheriff, District Attorney and Assessor).

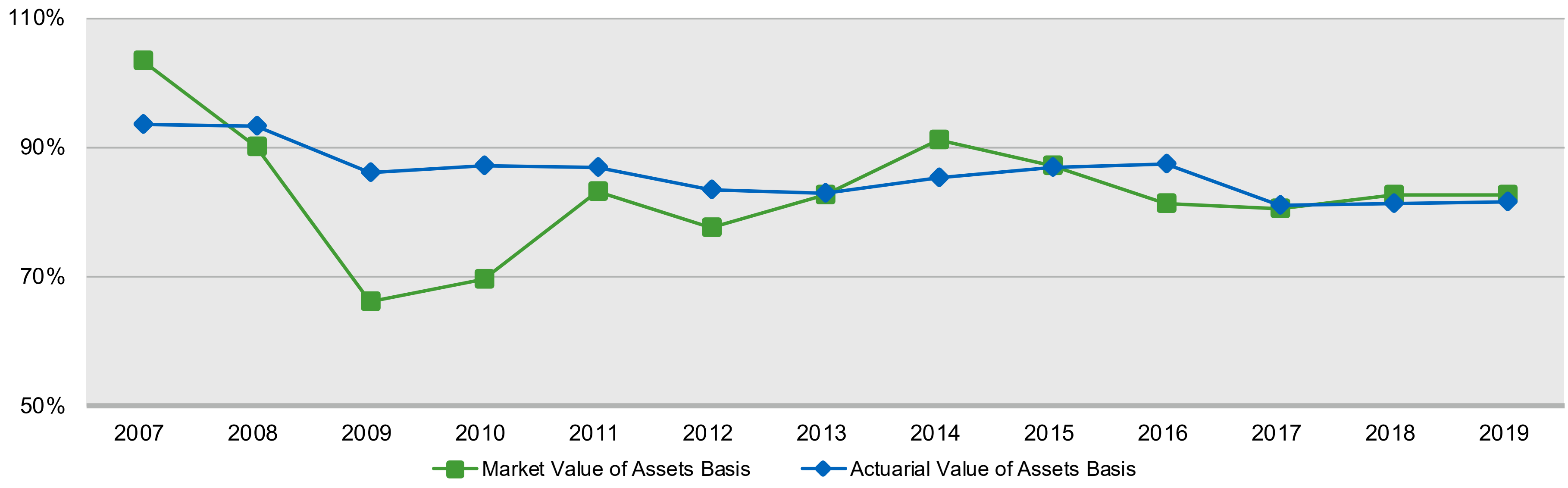
G. Funded Status

A commonly reported piece of information regarding the Plan's financial status is the funded ratio. These ratios compare the Market and Actuarial Value of Assets to the Actuarial Accrued Liability of the Plan. High ratios indicate a well-funded plan with assets sufficient to cover the Plan's Actuarial Accrued Liability. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other changes.

The chart below depicts a history of the funded ratio for the Plan. The chart on the next page shows the Plan's schedule of funding progress for the last ten years.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. As the chart below shows, the measures are different depending on whether the Actuarial or Market Value of Assets is used.

FUNDED RATIO
FOR YEARS ENDING JUNE 30, 2007 – 2019



SCHEDULE OF FUNDING PROGRESS
FOR YEARS ENDING JUNE 30, 2010 – 2019

Actuarial Valuation Date as of June 30,	Actuarial Value of Assets[1] (a)	Actuarial Accrued Liability (AAL)[1] (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (%) (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (%) [(b) - (a)] / (c)
2010	$6,216,994,000	$7,090,497,000	$873,503,000	87.7%	$912,644,000	95.7%
2011	6,420,824,000	7,382,897,000	962,073,000	87.0	880,766,000	109.2
2012	6,529,895,000	7,838,223,000	1,308,328,000	83.3	875,672,000	149.4
2013	6,797,757,000	8,210,980,000	1,413,223,000	82.8	877,657,000	161.0
2014	7,312,993,000	8,580,928,000	1,267,935,000	85.2	879,999,000	144.1
2015	7,838,825,000	9,028,679,000	1,189,854,000	86.8	897,341,000	132.6
2016	8,236,402,000	9,436,090,000	1,199,688,000	87.3	938,555,000	127.8
2017	8,665,226,000	10,680,998,000	2,015,772,000	81.1	980,359,000	205.6
2018	9,123,004,000	11,213,263,000	2,090,259,000	81.4	1,007,815,000	207.4
2019	9,703,313,000	11,895,520,000	2,192,207,000	81.6	1,038,341,000	211.1

(1) Includes contingency reserve and other non-valuation reserves.

H. Actuarial Balance Sheet

An overview of the Plan's funding is given by an Actuarial Balance Sheet. In this approach, first the amount and timing of all future payments that will be made by the Plan for current participants is determined. Then these payments are discounted at the valuation interest rate to the date of the valuation, thereby determining the present value, referred to as the Actuarial Present Value of Future Benefits of the Plan.

Second, this Actuarial Present Value of Future Benefits is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer Normal Cost contributions, and the present value of future employer amortization payments for the Unfunded Actuarial Accrued Liability.

ACTUARIAL BALANCE SHEET FOR YEAR ENDED JUNE 30, 2019

	Basic ($ in '000s)	COLA ($ in '000s)	Total ($ in '000s)
Actuarial Present Value of Future Benefits			
• Present value of benefits for retired members and beneficiaries	$4,362,067	$2,618,362	$6,980,429
• Present value of benefits for inactive vested members	303,036	71,183	374,219
• Present value of benefits for active members	5,147,615	1,264,599	6,412,214
• Non-valuation reserves	0	0	0
• Contingency reserve	129,815	0	129,815
Total Actuarial Present Value of Future Benefits	**$9,942,533**	**$3,954,144**	**$13,896,677**
Current and future assets			
• Total Valuation Value of Assets	$6,389,047	$3,168,500	$9,557,547
• Present value of future contributions by members	598,048	184,904	782,952
• Present value of future employer contributions for:			
» Entry age Normal Cost	1,022,095	196,110	1,218,205
» Unfunded Actuarial Accrued Liability	1,803,528	388,679	2,192,207
• Balance of transfer to offset member COLA rate	0	15,951	15,951
• Contingency reserve	129,815	0	129,815
Total of current and future assets	**$9,942,533**	**$3,954,144**	**$13,896,677**

Note: Results may be slightly off due to rounding.

I. Volatility Ratios

Retirement plans are subject to volatility in the level of required contributions. This volatility tends to increase as retirement plans become more mature.

The Asset Volatility Ratio (AVR), which is equal to the Market Value of Assets divided by total payroll, provides an indication of the potential contribution volatility for any given level of investment volatility. A higher AVR indicates that the plan is subject to a greater level of contribution volatility. This is a current measurement since it is based on the current level of assets.

The current AVR is about 9.5. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 9.5% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.7% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

The Liability Volatility Ratio (LVR), which is equal to the Actuarial Accrued Liability divided by payroll, provides an indication of the longer-term potential for contribution volatility for any given level of investment volatility. This is because, over an extended period of time, the plan's assets should track the plan's liabilities.

The LVR also indicates how volatile contributions will be in response to changes in the Actuarial Accrued Liability due to actual experience or to changes in actuarial assumptions. The current LVR is about 11.5 but is 9.4 for Miscellaneous compared to 18.6 for Safety. This means that assumption changes will have a greater impact on employer contribution rates for Safety than Miscellaneous.

The chart on the next page shows how the asset and liability volatility ratios have varied over time.

VOLATILITY RATIOS FOR YEARS ENDED 2010 – 2019

Year Ended June 30	Asset Volatility Ratio			Liability Volatility Ratio		
	Miscellaneous	Safety	Total	Miscellaneous	Safety	Total
2010	4.5	9.1	5.5	6.4	13.4	7.8
2011	5.8	11.6	7.0	6.9	14.0	8.4
2012	5.8	11.0	6.9	7.5	14.5	9.0
2013	6.6	11.7	7.7	7.9	14.6	9.4
2014	7.6	13.2	8.9	8.1	15.2	9.8
2015	7.5	13.0	8.8	8.4	15.8	10.1
2016	7.0	12.2	8.2	8.4	15.7	10.1
2017	7.4	13.5	8.8	8.9	17.8	10.9
2018	7.8	14.0	9.2	9.1	18.0	11.1
2019	8.0	14.6	9.5	9.4	18.6	11.5

J. Risk Assessment

Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan.

A copy of the stand-alone risk assessment report including the additional analyses recommended by Segal in consultation with SCERS staff will be available in the first quarter of 2020. While this section does not contain a detailed analysis of the potential range of future measurements, it does include a concise discussion of some of the primary risks that may affect the Plan's future financial condition.

This section provides descriptions and basic assessments of the primary risks that are likely to have an ongoing influence on the Plan's financial health, as well as a discussion of historical trends and maturity measures.

Risk Assessments

- Asset/Liability Mismatch Risk (the potential that future plan experience does not affect asset and liability values in the same way, causing them to diverge)

  The most significant asset/liability mismatch risk to the Plan is investment risk, as discussed below. In fact, investment risk has the potential to impact asset/liability mismatch in two ways. The first mismatch is evident in annual valuations: when asset values deviate from assumptions, they are typically independent from liability changes. The second mismatch can be caused when systemic asset deviations from assumptions may signal the need for an assumption change, which causes liability values and contribution rates to move in the opposite direction from any changes in the expected experience of asset growth rates.

  Asset/liability mismatch can also be caused by demographic assumption risk such as longevity, which affects liabilities but have no impact on asset levels. This risk is also discussed below.

- Investment Risk (the risk that investment returns will be different than expected)

  The investment return assumption is a long-term, static assumption for valuation purposes even though in reality market experience can be quite volatile in any given year. That volatility can cause significant changes in the financial health of the plan, affecting both funded status and contribution rates. The inherent year-to-year volatility is reduced by smoothing through the Actuarial Value of Assets, however investment experience can still have a sizable impact. As discussed in *Section 2, Subsection I, Volatility Ratios,* on page 40, a 1% asset gain or loss (relative to the assumed investment return) translates to about 9.5% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.7% of payroll decrease/(increase) in the required contribution for each 1% asset gain or loss.

  The single year market value rate of return over the last 10 years has ranged from a low of -1.00% to a high of 23.81%.

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes current life expectancy assumptions and an expectation of future improvement in life expectancy, which are significant assumptions given the relatively long duration of liabilities for pension plans. Emerging plan experience that does not match these expectations will result in increases or decreases in the actuarially determined contribution over time. This risk can be reduced by using tables appropriate for the Plan (public experience tables) that are weighted by benefit levels, and by using generational mortality projections. We will be discussing the use of such mortality tables with the Board for the upcoming triennial experience study before we complete our next valuation as of June 30, 2020.

- Other Risks

  In addition to longevity, the valuation includes a variety of other assumptions that are unlikely to match future experience exactly. One example is projected salary scales over time. As salary is central to the determination of benefits paid in retirement, deviations from the projected salary scales could have a material impact on the benefits anticipated for each member. Examples of demographic assumptions include retirement, termination and disability assumptions, and will likely vary in significance for different groups (for example, disability assumptions are typically more significant for safety groups).

Some plans also carry significant contribution risk, defined as the potential for actual future contributions deviating from expected future contributions. However, the employers have a proven track-record of making the Actuarially Determined Contributions based on the Board’s Actuarial Funding Policy, so contribution risk is minimal.

Evaluation of Historical Trends

Past experience can help demonstrate the sensitivity of key results to the Plan’s actual experience. Over the past ten years:

- The funded percentage on the Actuarial Value of Assets basis has decreased from 87.7% to 81.6%. For a more detailed history see *Section 2, Subsection G, Funded Status* starting on page 37.
- The average geometric investment return on the Actuarial Value of Assets over the last 10 years was 6.55%. This includes a high single-year return of 9.08% and a low of 2.57%. The average over the last 5 years 7.27%. For more details see the Investment Return table in *Section 2, Subsection C* on page 23.
- The primary source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption changes in 2017 changed the discount rate from 7.50% to 7.00% and updated mortality tables, adding $824 million in unfunded liability. For more details on the unfunded liability changes see *Section 3, Exhibit H, Table of Amortization Bases* starting on page 72.
- The plan’s funding policy effectively deals with these unfunded liabilities over time. This can be seen most clearly in *Section 3, Exhibit I, Projection of UAAL Balances and Payments* provided on pages 75 and 76.

Maturity Measures

In the last 10 years the ratio of members in pay status to active participants has increased from 0.63 to 0.98. An increased ratio indicates that the plan has grown in maturity over time. This is to be expected, but is also informative for understanding plan sensitivity to particular risks. For more details see *Section 2, Subsection A, Member Data* on page 14.

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities. For the prior year benefits paid were $95.4 million more than contributions received. Plans with high levels of negative cash flows may have a need for a larger allocation to income generating assets, which can create a drag on investment return. However, this plan currently has relatively low levels of negative cash flows. For more details on historical cash flows see the Comparison of Contributions with Benefits in *Section 2, Subsection B, Financial Information* on page 18.

A further discussion of plan maturity measures and how they relate to changes in assets and liabilities is included in *Section 2, Subsection I, Volatility Ratios* starting on page 40.

EXHIBIT A – TABLE OF PLAN COVERAGE
TOTAL PLAN

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	12,678	12,677	0.0%
• Average age	45.7	45.7	0.0
• Average years of service	11.9	11.9	0.0
• Total projected compensation[1]	$1,038,340,908	$1,007,815,585	3.0%
• Average projected compensation	$81,901	$79,500	3.0%
• Account balances	$820,202,451	$756,178,864	8.5%
• Total active vested members	8,477	8,599	-1.4%
Inactive vested members:			
• Number[2]	3,602	3,509	2.7%
• Average age	47.0	47.4	-0.4
Retired members:			
• Number in pay status	10,001	9,547	4.8%
• Average age	69.6	69.5	0.1
• Average monthly benefit	$3,812	$3,668	3.9%
Disabled members:			
• Number in pay status	719	716	0.4%
• Average age	66.6	66.4	0.2
• Average monthly benefit	$2,969	$2,843	4.4%
Beneficiaries:			
• Number in pay status	1,661	1,620	2.5%
• Average age	72.2	71.8	0.4
• Average monthly benefit	$2,012	$1,929	4.3%

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
MISCELLANEOUS TIER 1

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	34	46	-26.1%
• Average age	63.1	62.3	0.8
• Average years of service	37.4	36.3	1.1
• Total projected compensation[1]	$2,870,069	$3,867,063	-25.8%
• Average projected compensation	$84,414	$84,067	0.4%
• Account balances	$6,236,233	$8,045,114	-22.5%
• Total active vested members	34	46	-26.1%
Inactive vested members:			
• Number[2]	27	37	-27.0%
• Average age	68.4	66.6	1.8
Retired members:			
• Number in pay status	2,634	2,724	-3.3%
• Average age	76.3	75.8	0.5
• Average monthly benefit	$3,989	$3,785	5.4%
Disabled members:			
• Number in pay status	139	148	-6.1%
• Average age	77.2	76.5	0.7
• Average monthly benefit	$2,469	$2,356	4.8%
Beneficiaries:			
• Number in pay status	730	736	-0.8%
• Average age	78.7	78.3	0.4
• Average monthly benefit	$2,022	$1,921	5.3%

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
MISCELLANEOUS TIER 2

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	45	52	-13.5%
• Average age	57.2	56.9	0.3
• Average years of service	28.3	27.3	1.0
• Total projected compensation[1]	$3,433,719	$3,871,213	-11.3%
• Average projected compensation	$76,305	$74,446	2.5%
• Account balances	$4,376,907	$4,766,897	-8.2%
• Total active vested members	45	52	-13.5%
Inactive vested members:			
• Number[2]	117	134	-12.7%
• Average age	58.3	57.7	0.6
Retired members:			
• Number in pay status	375	363	3.3%
• Average age	69.6	69.3	0.3
• Average monthly benefit	$1,163	$1,111	4.7%
Disabled members:			
• Number in pay status	29	29	0.0%
• Average age	68.3	67.3	1.0
• Average monthly benefit	$938	$938	0.0%
Beneficiaries:			
• Number in pay status	56	57	-1.8%
• Average age	71.9	71.0	0.9
• Average monthly benefit	$722	$713	1.3%

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
MISCELLANEOUS TIER 3

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	6,229	6,701	-7.0%
• Average age	51.3	50.8	0.5
• Average years of service	17.5	16.8	0.7
• Total projected compensation[(1)]	$524,945,234	$544,677,967	-3.6%
• Average projected compensation	$84,274	$81,283	3.7%
• Account balances	$484,075,659	$466,484,947	3.8%
• Total active vested members	6,171	6,634	-7.0%
Inactive vested members:			
• Number[(2)]	2,274	2,355	-3.4%
• Average age	49.4	49.2	0.2
Retired members:			
• Number in pay status	5,145	4,708	9.3%
• Average age	67.8	67.6	0.2
• Average monthly benefit	$2,755	$2,627	4.9%
Disabled members:			
• Number in pay status	293	285	2.8%
• Average age	64.0	63.9	0.1
• Average monthly benefit	$1,945	$1,885	3.2%
Beneficiaries:			
• Number in pay status	461	431	7.0%
• Average age	66.4	65.7	0.7
• Average monthly benefit	$1,173	$1,101	6.5%

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
MISCELLANEOUS TIER 4

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	342	350	-2.3%
• Average age	44.4	43.6	0.8
• Average years of service	5.9	5.0	0.9
• Total projected compensation(1)	$30,338,040	$29,576,014	2.6%
• Average projected compensation	$88,708	$84,503	5.0%
• Account balances	$12,679,726	$10,037,641	26.3%
• Total active vested members	239	220	8.6%
Inactive vested members:			
• Number(2)	99	87	13.8%
• Average age	42.4	40.8	1.6
Retired members:			
• Number in pay status	7	5	40.0%
• Average age	63.7	59.6	4.1
• Average monthly benefit	$1,032	$384	168.8%
Disabled members:			
• Number in pay status	- -	- -	N/A
• Average age	- -	- -	N/A
• Average monthly benefit	- -	- -	N/A
Beneficiaries:			
• Number in pay status	- -	- -	N/A
• Average age	- -	- -	N/A
• Average monthly benefit	- -	- -	N/A

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
MISCELLANEOUS TIER 5

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	3,934	3,437	14.5%
• Average age	39.0	38.3	0.7
• Average years of service	2.8	2.3	0.5
• Total projected compensation[1]	$240,731,316	$198,155,621	21.5%
• Average projected compensation	$61,193	$57,654	6.1%
• Account balances	$54,115,745	$35,887,059	50.8%
• Total active vested members	518	162	219.8%
Inactive vested members:			
• Number[2]	673	463	45.4%
• Average age	38.4	38.2	0.2
Retired members:			
• Number in pay status	6	- -	N/A
• Average age	65.7	- -	N/A
• Average monthly benefit	$1,031	- -	N/A
Disabled members:			
• Number in pay status	- -	- -	N/A
• Average age	- -	- -	N/A
• Average monthly benefit	- -	- -	N/A
Beneficiaries:			
• Number in pay status	- -	- -	N/A
• Average age	- -	- -	N/A
• Average monthly benefit	- -	- -	N/A

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
SAFETY TIER 1

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	96	125	-23.2%
• Average age	52.1	51.2	0.9
• Average years of service	25.3	24.5	0.8
• Total projected compensation(1)	$14,225,343	$17,752,389	-19.9%
• Average projected compensation	$148,181	$142,019	4.3%
• Account balances	$26,741,709	$31,002,723	-13.7%
• Total active vested members	96	125	-23.2%
Inactive vested members:			
• Number(2)	37	53	-30.2%
• Average age	53.4	53.2	0.2
Retired members:			
• Number in pay status	1,344	1,319	1.9%
• Average age	66.2	65.8	0.4
• Average monthly benefit	$7,739	$7,379	4.9%
Disabled members:			
• Number in pay status	187	189	-1.1%
• Average age	66.9	66.4	0.5
• Average monthly benefit	$5,093	$4,837	5.3%
Beneficiaries:			
• Number in pay status	359	348	3.2%
• Average age	69.0	68.3	0.7
• Average monthly benefit	$3,253	$3,150	3.3%

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
SAFETY TIER 2

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	1,151	1,214	-5.2%
• Average age	45.2	44.6	0.6
• Average years of service	17.6	16.8	0.8
• Total projected compensation[1]	$146,248,671	$146,790,318	-0.4%
• Average projected compensation	$127,062	$120,915	5.1%
• Account balances	$197,018,517	$176,287,747	11.8%
• Total active vested members	1,148	1,212	-5.3%
Inactive vested members:			
• Number[2]	329	340	-3.2%
• Average age	43.9	43.4	0.5
Retired members:			
• Number in pay status	489	428	14.3%
• Average age	62.3	62.6	-0.3
• Average monthly benefit	$5,293	$5,143	2.9%
Disabled members:			
• Number in pay status	70	64	9.4%
• Average age	54.5	53.7	0.8
• Average monthly benefit	$3,407	$3,207	6.2%
Beneficiaries:			
• Number in pay status	54	48	12.5%
• Average age	57.2	55.9	1.3
• Average monthly benefit	$2,105	$2,079	1.3%

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
SAFETY TIER 3

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	118	118	0.0%
• Average age	40.2	39.1	1.1
• Average years of service	7.5	6.7	0.8
• Total projected compensation[1]	$13,581,981	$12,359,087	9.9%
• Average projected compensation	$115,102	$104,738	9.9%
• Account balances	$9,998,263	$7,552,038	32.4%
• Total active vested members	92	89	3.4%
Inactive vested members:			
• Number[2]	11	10	10.0%
• Average age	40.2	40.2	0.0
Retired members:			
• Number in pay status	- -	- -	N/A
• Average age	- -	- -	N/A
• Average monthly benefit	- -	- -	N/A
Disabled members:			
• Number in pay status	1	1	0.0%
• Average age	41.1	40.1	1.0
• Average monthly benefit	$3,185	$3,123	2.0%
Beneficiaries:			
• Number in pay status	- -	- -	N/A
• Average age	- -	- -	N/A
• Average monthly benefit	- -	- -	N/A

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
SAFETY TIER 4

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	729	634	15.0%
• Average age	33.7	33.4	0.3
• Average years of service	3.2	2.6	0.6
• Total projected compensation(1)	$61,966,535	$50,765,913	22.1%
• Average projected compensation	$85,002	$80,072	6.2%
• Account balances	$24,959,692	$16,114,698	54.9%
• Total active vested members	134	59	127.1%
Inactive vested members:			
• Number(2)	35	30	16.7%
• Average age	34.1	32.3	1.8
Retired members:			
• Number in pay status	1	- -	N/A
• Average age	65.3	- -	N/A
• Average monthly benefit	$2,439	- -	N/A
Disabled members:			
• Number in pay status	- -	- -	N/A
• Average age	- -	- -	N/A
• Average monthly benefit	- -	- -	N/A
Beneficiaries:			
• Number in pay status	1	- -	N/A
• Average age	27.4	- -	N/A
• Average monthly benefit	$3,488	- -	N/A

(1) Projected compensation for the June 30, 2019 valuation was calculated by increasing the annualized compensation earned during 2018-2019 by 3.25%.

(2) Includes inactive members due a refund of member contributions.

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
TOTAL PLAN

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	147	147	- -	- -	- -	- -	- -	- -	- -	- -
	$54,967	$54,967	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	1,010	957	53	- -	- -	- -	- -	- -	- -	- -
	$62,694	$61,619	$82,100	- -	- -	- -	- -	- -	- -	- -
30 - 34	1,381	989	275	113	4	- -	- -	- -	- -	- -
	$69,479	$64,183	$83,084	$81,159	$113,823	- -	- -	- -	- -	- -
35 - 39	1,574	655	286	507	126	- -	- -	- -	- -	- -
	$79,520	$65,851	$84,508	$89,661	$98,453	- -	- -	- -	- -	- -
40 - 44	1,902	479	207	531	582	101	2	- -	- -	- -
	$85,404	$66,400	$82,387	$88,552	$93,161	$119,665	$126,354	- -	- -	- -
45 - 49	1,990	358	158	407	594	393	76	4	- -	- -
	$93,297	$67,149	$79,398	$85,311	$95,573	$120,606	$129,784	$80,590	- -	- -
50 - 54	1,786	274	153	316	440	317	223	57	6	- -
	$88,389	$69,295	$77,607	$83,910	$85,739	$104,877	$103,007	$102,266	$119,179	- -
55 - 59	1,564	210	132	241	381	235	236	106	22	1
	$85,219	$67,509	$78,003	$81,902	$81,295	$100,899	$92,757	$99,771	$83,951	$72,741
60 - 64	985	103	76	189	228	156	131	76	23	3
	$81,585	$66,456	$84,052	$81,762	$74,564	$83,722	$93,058	$93,827	$88,998	$82,001
65 - 69	266	29	34	63	65	33	21	10	7	4
	$77,429	$69,834	$73,663	$77,148	$72,857	$89,231	$82,019	$96,538	$73,428	$81,004
70 & over	73	8	5	18	16	12	7	2	3	2
	$77,003	$72,741	$39,051	$88,191	$73,667	$76,676	$82,217	$61,230	$72,819	$120,679
Total	**12,678**	**4,209**	**1,379**	**2,385**	**2,436**	**1,247**	**696**	**255**	**61**	**10**
	$81,901	**$64,652**	**$81,382**	**$85,756**	**$88,450**	**$106,950**	**$99,808**	**$97,827**	**$87,564**	**$88,412**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
MISCELLANEOUS TIER 1

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35 - 39	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
40 - 44	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
45 - 49	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
50 - 54	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
55 - 59	9	- -	- -	- -	- -	- -	- -	- -	8	1
	$73,599	- -	- -	- -	- -	- -	- -	- -	$73,706	$72,741
60 - 64	14	- -	- -	- -	- -	1	2	1	8	2
	$84,807	- -	- -	- -	- -	$121,050	$47,712	$63,959	$90,972	$89,547
65 - 69	7	- -	- -	- -	- -	- -	- -	- -	3	4
	$77,885	- -	- -	- -	- -	- -	- -	- -	$73,726	$81,004
70 & over	4	- -	- -	1	- -	- -	- -	- -	1	2
	$118,797	- -	- -	$130,486	- -	- -	- -	- -	$103,343	$120,679
Total	**34**	**- -**	**- -**	**1**	**- -**	**1**	**2**	**1**	**20**	**9**
	$84,414	**- -**	**- -**	**$130,486**	**- -**	**$121,050**	**$47,712**	**$63,959**	**$82,097**	**$90,801**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
MISCELLANEOUS TIER 2

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35 - 39	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
40 - 44	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
45 - 49	2	- -	- -	- -	- -	- -	2	- -	- -	- -
	$71,853	- -	- -	- -	- -	- -	$71,853	- -	- -	- -
50 - 54	15	- -	- -	- -	2	- -	10	3	- -	- -
	$74,790	- -	- -	- -	$72,182	- -	$76,005	$72,483	- -	- -
55 - 59	12	- -	- -	- -	- -	1	9	2	- -	- -
	$77,958	- -	- -	- -	- -	$57,579	$80,847	$75,147	- -	- -
60 - 64	14	- -	- -	- -	- -	- -	10	3	1	- -
	$82,292	- -	- -	- -	- -	- -	$86,512	$71,585	$72,221	- -
65 - 69	2	- -	- -	- -	1	- -	- -	- -	1	- -
	$40,284	- -	- -	- -	$30,276	- -	- -	- -	$50,291	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**45**	**- -**	**- -**	**- -**	**3**	**1**	**31**	**8**	**2**	**- -**
	$76,305	**- -**	**- -**	**- -**	**$58,213**	**$57,579**	**$80,532**	**$72,813**	**$61,256**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
MISCELLANEOUS TIER 3

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	1	- -	1	- -	- -	- -	- -	- -	- -	- -
	$111,487	- -	$111,487	- -	- -	- -	- -	- -	- -	- -
30 - 34	131	6	33	90	2	- -	- -	- -	- -	- -
	$70,310	$56,897	$67,931	$71,776	$83,858	- -	- -	- -	- -	- -
35 - 39	535	9	89	366	71	- -	- -	- -	- -	- -
	$79,217	$47,953	$86,494	$79,091	$74,708	- -	- -	- -	- -	- -
40 - 44	942	13	67	441	384	36	1	- -	- -	- -
	$82,235	$68,355	$85,876	$84,421	$79,331	$83,156	$136,243	- -	- -	- -
45 - 49	1,117	7	51	370	460	192	33	4	- -	- -
	$87,068	$79,570	$79,801	$82,401	$86,560	$98,546	$93,317	$80,590	- -	- -
50 - 54	1,254	7	71	296	389	253	182	50	6	- -
	$87,448	$60,938	$77,878	$81,539	$80,570	$97,358	$98,393	$99,445	$119,179	- -
55 - 59	1,189	9	45	232	366	211	213	99	14	- -
	$86,658	$91,451	$78,311	$80,280	$79,715	$97,819	$90,913	$97,245	$89,806	- -
60 - 64	793	3	31	180	225	151	118	70	14	1
	$81,808	$59,934	$76,087	$79,306	$73,930	$81,987	$94,561	$93,916	$89,068	$66,908
65 - 69	206	4	11	62	63	32	21	10	3	- -
	$79,552	$145,197	$66,093	$76,318	$73,134	$87,826	$82,019	$96,538	$80,842	- -
70 & over	61	- -	5	17	16	12	7	2	2	- -
	$74,821	- -	$39,051	$85,703	$73,667	$76,676	$82,217	$61,230	$57,557	- -
Total	**6,229**	**58**	**404**	**2,054**	**1,976**	**887**	**575**	**235**	**39**	**1**
	$84,274	**$72,910**	**$79,725**	**$80,988**	**$80,309**	**$93,908**	**$93,815**	**$96,101**	**$91,716**	**$66,908**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
MISCELLANEOUS TIER 4

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	6	- -	6	- -	- -	- -	- -	- -	- -	- -
	$76,511	- -	$76,511	- -	- -	- -	- -	- -	- -	- -
30 - 34	61	18	43	- -	- -	- -	- -	- -	- -	- -
	$88,963	$88,611	$89,110	- -	- -	- -	- -	- -	- -	- -
35 - 39	70	18	50	2	- -	- -	- -	- -	- -	- -
	$82,055	$80,391	$82,524	$85,312	- -	- -	- -	- -	- -	- -
40 - 44	66	21	41	2	1	1	- -	- -	- -	- -
	$89,109	$100,227	$83,523	$85,580	$99,867	$80,973	- -	- -	- -	- -
45 - 49	37	19	18	- -	- -	- -	- -	- -	- -	- -
	$98,085	$111,887	$83,517	- -	- -	- -	- -	- -	- -	- -
50 - 54	38	11	26	1	- -	- -	- -	- -	- -	- -
	$96,156	$112,125	$90,423	$69,561	- -	- -	- -	- -	- -	- -
55 - 59	35	9	26	- -	- -	- -	- -	- -	- -	- -
	$81,796	$88,302	$79,543	- -	- -	- -	- -	- -	- -	- -
60 - 64	20	5	14	1	- -	- -	- -	- -	- -	- -
	$93,267	$115,562	$85,756	$86,952	- -	- -	- -	- -	- -	- -
65 - 69	9	2	7	- -	- -	- -	- -	- -	- -	- -
	$90,653	$80,760	$93,480	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**342**	**103**	**231**	**6**	**1**	**1**	**- -**	**- -**	**- -**	**- -**
	$88,708	**$97,477**	**$84,930**	**$83,049**	**$99,867**	**$80,973**	**- -**	**- -**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
MISCELLANEOUS TIER 5

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	107	107	- -	- -	- -	- -	- -	- -	- -	- -
	$45,943	$45,943	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	732	714	18	- -	- -	- -	- -	- -	- -	- -
	$54,924	$54,787	$60,362	- -	- -	- -	- -	- -	- -	- -
30 - 34	926	810	116	- -	- -	- -	- -	- -	- -	- -
	$61,509	$59,902	$72,727	- -	- -	- -	- -	- -	- -	- -
35 - 39	639	546	93	- -	- -	- -	- -	- -	- -	- -
	$64,157	$62,876	$71,679	- -	- -	- -	- -	- -	- -	- -
40 - 44	483	409	74	- -	- -	- -	- -	- -	- -	- -
	$63,510	$62,216	$70,666	- -	- -	- -	- -	- -	- -	- -
45 - 49	382	314	68	- -	- -	- -	- -	- -	- -	- -
	$63,283	$62,498	$66,911	- -	- -	- -	- -	- -	- -	- -
50 - 54	274	224	49	1	- -	- -	- -	- -	- -	- -
	$64,078	$63,432	$67,238	$53,720	- -	- -	- -	- -	- -	- -
55 - 59	228	175	53	- -	- -	- -	- -	- -	- -	- -
	$64,367	$62,340	$71,060	- -	- -	- -	- -	- -	- -	- -
60 - 64	117	94	22	1	- -	- -	- -	- -	- -	- -
	$65,804	$63,946	$74,491	$49,349	- -	- -	- -	- -	- -	- -
65 - 69	38	23	15	- -	- -	- -	- -	- -	- -	- -
	$60,374	$55,778	$67,421	- -	- -	- -	- -	- -	- -	- -
70 & over	8	8	- -	- -	- -	- -	- -	- -	- -	- -
	$72,741	$72,741	- -	- -	- -	- -	- -	- -	- -	- -
Total	**3,934**	**3,424**	**508**	**2**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$61,193	**$59,857**	**$70,235**	**$51,535**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
SAFETY TIER 1

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35 - 39	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
40 - 44	1	- -	- -	- -	- -	1	- -	- -	- -	- -
	$146,613	- -	- -	- -	- -	$146,613	- -	- -	- -	- -
45 - 49	41	- -	- -	2	1	14	24	- -	- -	- -
	$153,959	- -	- -	$131,930	$190,216	$137,412	$163,937	- -	- -	- -
50 - 54	32	- -	- -	- -	3	9	16	4	- -	- -
	$151,208	- -	- -	- -	$183,263	$131,332	$154,215	$159,860	- -	- -
55 - 59	16	- -	- -	- -	- -	5	8	3	- -	- -
	$138,752	- -	- -	- -	- -	$140,107	$124,702	$173,961	- -	- -
60 - 64	5	- -	- -	1	- -	1	1	2	- -	- -
	$114,704	- -	- -	$119,589	- -	$104,046	$71,863	$139,011	- -	- -
65 - 69	1	- -	- -	- -	- -	1	- -	- -	- -	- -
	$134,196	- -	- -	- -	- -	$134,196	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**96**	**- -**	**- -**	**3**	**4**	**31**	**49**	**9**	**- -**	**- -**
	$148,181	**- -**	**- -**	**$127,816**	**$185,002**	**$135,198**	**$152,478**	**$159,927**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
SAFETY TIER 2

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	28	1	7	18	2	- -	- -	- -	- -	- -
	$120,497	$77,461	$110,855	$124,050	$143,787	- -	- -	- -	- -	- -
35 - 39	201	1	14	131	55	- -	- -	- -	- -	- -
	$120,511	$124,609	$104,963	$118,534	$129,105	- -	- -	- -	- -	- -
40 - 44	349	- -	6	84	196	62	1	- -	- -	- -
	$121,555	- -	$120,780	$110,525	$120,259	$140,752	$116,464	- -	- -	- -
45 - 49	371	- -	6	31	131	186	17	- -	- -	- -
	$134,784	- -	$108,431	$116,869	$126,185	$142,448	$159,171	- -	- -	- -
50 - 54	133	1	1	16	46	55	14	- -	- -	- -
	$129,059	$63,898	$134,195	$129,889	$123,677	$135,135	$126,213	- -	- -	- -
55 - 59	51	- -	1	9	15	18	6	2	- -	- -
	$126,989	- -	$174,335	$123,719	$119,849	$128,526	$133,508	$138,185	- -	- -
60 - 64	16	- -	4	6	3	3	- -	- -	- -	- -
	$147,277	- -	$153,101	$153,700	$122,107	$151,836	- -	- -	- -	- -
65 - 69	2	- -	- -	1	1	- -	- -	- -	- -	- -
	$113,299	- -	- -	$128,603	$97,994	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**1,151**	**3**	**39**	**296**	**449**	**324**	**38**	**2**	**- -**	**- -**
	$127,062	**$88,656**	**$116,453**	**$117,941**	**$123,475**	**$140,196**	**$141,853**	**$138,185**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
SAFETY TIER 3

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	2	- -	2	- -	- -	- -	- -	- -	- -	- -
	$117,160	- -	$117,160	- -	- -	- -	- -	- -	- -	- -
30 - 34	35	6	25	4	- -	- -	- -	- -	- -	- -
	$109,813	$96,713	$114,045	$103,011	- -	- -	- -	- -	- -	- -
35 - 39	30	6	21	3	- -	- -	- -	- -	- -	- -
	$116,008	$107,201	$118,647	$115,148	- -	- -	- -	- -	- -	- -
40 - 44	22	8	9	4	- -	1	- -	- -	- -	- -
	$115,560	$129,176	$114,912	$84,091	- -	$138,339	- -	- -	- -	- -
45 - 49	19	5	9	2	2	1	- -	- -	- -	- -
	$123,251	$130,153	$137,350	$82,201	$116,140	$58,170	- -	- -	- -	- -
50 - 54	5	1	2	1	- -	- -	1	- -	- -	- -
	$99,635	$128,924	$99,335	$101,985	- -	- -	$68,596	- -	- -	- -
55 - 59	3	- -	3	- -	- -	- -	- -	- -	- -	- -
	$124,440	- -	$124,440	- -	- -	- -	- -	- -	- -	- -
60 - 64	2	- -	2	- -	- -	- -	- -	- -	- -	- -
	$134,195	- -	$134,195	- -	- -	- -	- -	- -	- -	- -
65 - 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**118**	**26**	**73**	**14**	**2**	**2**	**1**	**- -**	**- -**	**- -**
	$115,102	**$116,792**	**$119,011**	**$97,160**	**$116,140**	**$98,255**	**$68,596**	**- -**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
SAFETY TIER 4

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	40	40	- -	- -	- -	- -	- -	- -	- -	- -
	$79,106	$79,106	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	269	243	26	- -	- -	- -	- -	- -	- -	- -
	$82,944	$81,696	$94,612	- -	- -	- -	- -	- -	- -	- -
30 - 34	200	148	51	1	- -	- -	- -	- -	- -	- -
	$85,697	$83,527	$92,376	$66,144	- -	- -	- -	- -	- -	- -
35 - 39	99	75	19	5	- -	- -	- -	- -	- -	- -
	$84,250	$82,077	$90,410	$93,433	- -	- -	- -	- -	- -	- -
40 - 44	39	28	10	- -	1	- -	- -	- -	- -	- -
	$84,767	$83,300	$88,767	- -	$85,834	- -	- -	- -	- -	- -
45 - 49	21	13	6	2	- -	- -	- -	- -	- -	- -
	$85,662	$83,193	$89,171	$91,183	- -	- -	- -	- -	- -	- -
50 - 54	35	30	4	1	- -	- -	- -	- -	- -	- -
	$96,228	$97,510	$91,518	$76,586	- -	- -	- -	- -	- -	- -
55 - 59	21	17	4	- -	- -	- -	- -	- -	- -	- -
	$97,149	$97,038	$97,621	- -	- -	- -	- -	- -	- -	- -
60 - 64	4	1	3	- -	- -	- -	- -	- -	- -	- -
	$96,387	$76,433	$103,038	- -	- -	- -	- -	- -	- -	- -
65 - 69	1	- -	1	- -	- -	- -	- -	- -	- -	- -
	$111,829	- -	$111,829	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**729**	**595**	**124**	**9**	**1**	**- -**	**- -**	**- -**	**- -**	**- -**
	$85,002	**$83,360**	**$92,654**	**$88,029**	**$85,834**	**- -**	**- -**	**- -**	**- -**	**- -**

EXHIBIT C – RECONCILIATION OF MEMBER DATA

	Active Members	Inactive Vested Members[1]	Retired Members	Disabled Members	Beneficiaries	Total
Number as of June 30, 2018	**12,677**	**3,509**	**9,547**	**716**	**1,620**	**28,069**
• New members	940	65	0	0	106	1,111
• Terminations – with vested rights	(363)	363	0	0	0	0
• Contribution refunds	(114)	(78)	0	0	0	(192)
• Retirements	(469)	(199)	668	0	0	0
• New disabilities	(9)	(5)	(14)	28	0	0
• Return to work	27	(25)	(2)	0	0	0
• Died with or without beneficiary	(10)	(27)	(199)	(25)	(65)	(326)
• Data adjustments	(1)	(1)	1	0	0	(1)
Number as of June 30, 2019	**12,678**	**3,602**	**10,001**	**719**	**1,661**	**28,661**

[1] Includes inactive members due a refund of member contributions.

EXHIBIT D – SUMMARY STATEMENT OF INCOME AND EXPENSES ON A MARKET VALUE BASIS

		Year Ended June 30, 2019		Year Ended June 30, 2018
Net assets at market value at the beginning of the year		$9,251,937,000		$8,584,225,000
Contribution income:				
• Employer contributions	$288,581,000		$201,631,000	
• Member contributions	121,843,000		99,906,000	
Net contribution income		$410,424,000		$301,537,000
Investment income:				
• Interest, dividends and other income	$222,794,000		$195,644,000	
• Asset appreciation	581,330,000		770,691,000	
• Less investment and administrative fees	(138,938,000)		(131,852,000)	
Net investment income		$665,186,000		$834,483,000
Total income available for benefits		**$1,075,610,000**		**$1,136,020,000**
Less benefit payments:				
• Benefits paid	$(502,944,000)		$(465,354,000)	
• Withdrawal of contributions	(2,909,000)		(2,954,000)	
Net benefit payments		$(505,853,000)		$(468,308,000)
Change in net assets at market value		**$569,757,000**		**$667,712,000**
Net assets at market value at the end of the year		**$9,821,694,000**		**$9,251,937,000**

Note: Results may be slightly off due to rounding.

EXHIBIT E – SUMMARY STATEMENT OF PLAN ASSETS

	Year Ended June 30, 2019		Year Ended June 30, 2018	
Cash equivalents		$441,941,000		$289,813,000
Accounts receivable:				
• Securities sold	$0		$0	
• Accrued investment income	18,343,000		15,623,000	
• Employer and member contributions	50,076,000		4,101,000	
• Investment sales and other	280,274,000		62,450,000	
Total accounts receivable		$348,693,000		$82,174,000
Investments:				
• Equities	$5,064,220,000		$4,929,908,000	
• Absolute return	919,252,000		889,585,000	
• Opportunities	0		0	
• Fixed income investments	1,870,894,000		1,808,451,000	
• Real assets	1,551,953,000		1,462,159,000	
• Securities lending collateral	273,036,000		365,734,000	
Total investments at market value		$9,689,355,000		$9,455,837,000
Other assets		$7,215,000		$2,923,000
Total assets		$10,487,204,000		$9,830,747,000
Accounts payable:				
• Accounts payable and other liabilities	$(9,341,000)		$(12,592,000)	
• Investment trades and warrants payable	(388,248,000)		(200,484,000)	
• Securities lending liability	(267,921,000)		(365,734,000)	
Total accounts payable		$(665,510,000)		$(578,810,000)
Net assets at market value		**$9,821,694,000**		**$9,251,937,000**
Net assets at actuarial value		**$9,703,313,000**		**$9,123,004,000**
Net assets at valuation value		**$9,557,547,000**		**$9,073,178,000**

Note: Results may be slightly off due to rounding.

EXHIBIT F – SUMMARY OF REPORTED RESERVE INFORMATION AS OF JUNE 30, 2019

	Reserves
Included in Valuation Value of Assets	
• Employee Reserve	$906,927,252
• Employer Reserve	2,908,794,764
• Retiree Reserve	5,740,301,528
• Death Benefit Reserve	17,474,649
Subtotal: Preliminary Valuation Value of Assets(1)	**$9,573,498,193**
Not Included in Valuation Value of Assets	
• Contingency Reserve	$129,814,743
Subtotal: Actuarial Value of Assets	**$9,703,312,936**
Market Stabilization Reserve	118,381,064
Total Market Value of Assets	**$9,821,694,000**

(1) Please note that the Final Valuation Value of Assets (i.e. $9,557,547,193) as shown on page 19 is calculated by taking the Preliminary Valuation Value of Assets and adjusting for the balance of transfer to offset member COLA rate.

EXHIBIT F – SUMMARY OF REPORTED RESERVE INFORMATION AS OF JUNE 30, 2019 (CONTINUED)

	Change in Reserves					
	Balance at June 30, 2018	Interest Credit	Contributions	Benefits	Transfers	Balance at June 30, 2019
Employee Reserve	$843,779,930	$17,391,455	$121,842,819	$(2,909,050)	$(73,177,902)	$906,927,252
Employer Reserve	2,826,540,136	198,532,648	288,580,950	(325,657)	(404,533,313)	2,908,794,764
Retiree Reserve	5,358,078,050	406,254,476	0	(501,742,213)	477,711,215	5,740,301,528
Death Benefit Reserve	17,095,066	1,255,316	0	(875,733)	0	17,474,649
Subtotal	**$9,045,493,182**	**$623,433,895**	**$410,423,769**	**$(505,852,653)**	**$0**	**$9,573,498,193**
Contingency Reserve	$77,510,868	$52,303,875	$0	$0	$0	$129,814,743
Total Allocated Reserves	**$9,123,004,050**	**$675,737,770**	**$410,423,769**	**$(505,852,653)**	**$0**	**$9,703,312,936**
Market Stabilization Reserve	**128,932,950**	**(10,551,886)**	**0**	**0**	**0**	**118,381,064**
Net Market Value of Assets	**$9,251,937,000**	**$665,185,884**	**$410,423,769**	**$(505,852,653**	**$0**	**$9,821,694,000**

Note: Results may be slightly off due to rounding.

EXHIBIT F – SUMMARY OF REPORTED RESERVE INFORMATION AS OF JUNE 30, 2019 (CONTINUED)

	Per Excess Earnings Policy
Earnings from June 30, 2018 to June 30, 2019	$665,185,884
Contingency Reserve[(1)]	(52,303,875)
Subtotal:	**$612,882,009**
Amounts Credited for:	
Market Stabilization Reserve	$10,551,886
Regular Interest Crediting	(623,433,895)
Subtotal	**$(612,882,009)**
Net Excess Earnings	**$0**
Amount Credited Under Excess Earnings Policy for:	
Contingency Reserve[(1)]	$0
Board Provided Supplemental Benefits	0
Amount Over Reserved Benefits	0
Employer Reserves	0
Member Future COLA Contribution Offset	0
Subtotal	**$0**
Remaining Excess Earnings	**$0**

(1) As a result of interest crediting, $52,303,875 was added to the Contingency Reserve on June 30, 2019. As there was a balance of $77,510,868 in the Contingency Reserve as of June 30, 2018, the balance in that reserve as of June 30, 2019 after adding the $52,303,875 is $129,814,743.

EXHIBIT G – DEVELOPMENT OF THE FUND THROUGH JUNE 30, 2019

Year Ended June 30	Employer Contributions	Member Contributions	Net Investment Return[1]	Benefit Payments	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2010	$167,141,893	$52,413,571	$611,572,322	$258,023,786	$4,980,962,000	$6,216,994,000	124.8%
2011	182,920,751	57,151,126	1,200,204,162	280,594,039	6,140,644,000	6,420,824,000	104.6%
2012	179,098,469	65,690,252	-9,702,807	301,803,914	6,073,926,000	6,529,895,000	107.5%
2013	189,663,720	68,242,619	779,729,591	323,566,930	6,787,995,000	6,797,757,000	100.1%
2014	210,503,324	57,634,896	1,101,487,307	347,619,527	7,810,001,000	7,312,993,000	93.6%
2015	222,959,365	68,142,630	152,368,245	374,657,240	7,878,814,000	7,838,825,000	99.5%
2016	209,020,162	77,493,671	-78,760,809	405,702,024	7,680,865,000	8,236,402,000	107.2%
2017	203,928,296	89,488,759	1,042,009,164	432,066,219	8,584,225,000	8,665,226,000	100.9%
2018	201,631,134	99,905,678	834,483,764	468,308,576	9,251,937,000	9,123,004,000	98.6%
2019	288,580,950	121,842,819	665,185,884	505,852,653	9,821,694,000	9,703,313,000	98.8%

[1] On a market basis, net of investment fees and administrative expenses.

EXHIBIT H – TABLE OF AMORTIZATION BASES

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment ($ in '000s)
Miscellaneous						
Restart amortization[1]	June 30, 2012	$814,400	23	$804,524	16	$67,245
Actuarial loss[1]	June 30, 2013	34,060	20	32,228	14	2,980
Actuarial gain[1]	June 30, 2014	(125,182)	20	(120,524)	15	(10,573)
Assumption changes[1]	June 30, 2014	(46,607)	20	(44,872)	15	(3,936)
Actuarial gain[1]	June 30, 2015	(73,919)	20	(72,104)	16	(6,027)
Withdrawn employers[2]	June 30, 2015	2,989	20	2,915	16	244
Actuarial loss[1]	June 30, 2016	12,986	20	12,785	17	1,022
Actuarial loss[1]	June 30, 2017	12,571	20	12,450	18	955
Assumption changes[1]	June 30, 2017	466,874	20	462,359	18	35,472
Actuarial loss[1],[3]	June 30, 2018	6,060	20	6,039	19	446
Actuarial loss[4]	June 30, 2018	39,429	20	39,290	19	2,901
Actuarial loss[1],[3]	June 30, 2019	6,060	20	6,060	20	432
Actuarial loss[4]	June 30, 2019	51,548	20	51,548	20	3,674
Subtotal				**$1,192,698**		**$94,835**

Note: Results may be slightly off due to rounding.

(1) These amounts are spread over the payroll for all Miscellaneous employers excluding Rio Linda Elverta Recreation and Parks District.

(2) This amount is spread over the payroll for Miscellaneous County only.

(3) These amounts are due to deferred investment losses that were established prior to July 1, 2017. The total amount of those losses for Miscellaneous and Safety combined is $9,275,175 for both June 30, 2018 and June 30, 2019.

(4) These amounts are spread over the payroll for all Miscellaneous employers including Rio Linda Elverta Recreation and Parks District.

EXHIBIT H – TABLE OF AMORTIZATION BASES (CONTINUED)

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment ($ in '000s)
Safety						
LEMA	June 30, 2010	$4,047	10	$649	1	$673
Restart amortization	June 30, 2012	493,928	23	487,937	16	40,784
Actuarial loss	June 30, 2013	53,174	20	50,313	14	4,652
Actuarial gain	June 30, 2014	(40,247)	20	(38,749)	15	(3,399)
Assumption changes	June 30, 2014	62,388	20	60,066	15	5,269
Actuarial gain	June 30, 2015	(8,318)	20	(8,114)	16	(678)
Actuarial gain	June 30, 2016	(1,139)	20	(1,122)	17	(90)
Actuarial gain	June 30, 2017	(14,836)	20	(14,693)	18	(1,127)
Assumption changes	June 30, 2017	356,837	20	353,386	18	27,112
Actuarial loss	June 30, 2018	44,898	20	44,740	19	3,304
Actuarial loss	June 30, 2019	65,096	20	65,096	20	4,639
Subtotal				**$999,509**		**$81,139**

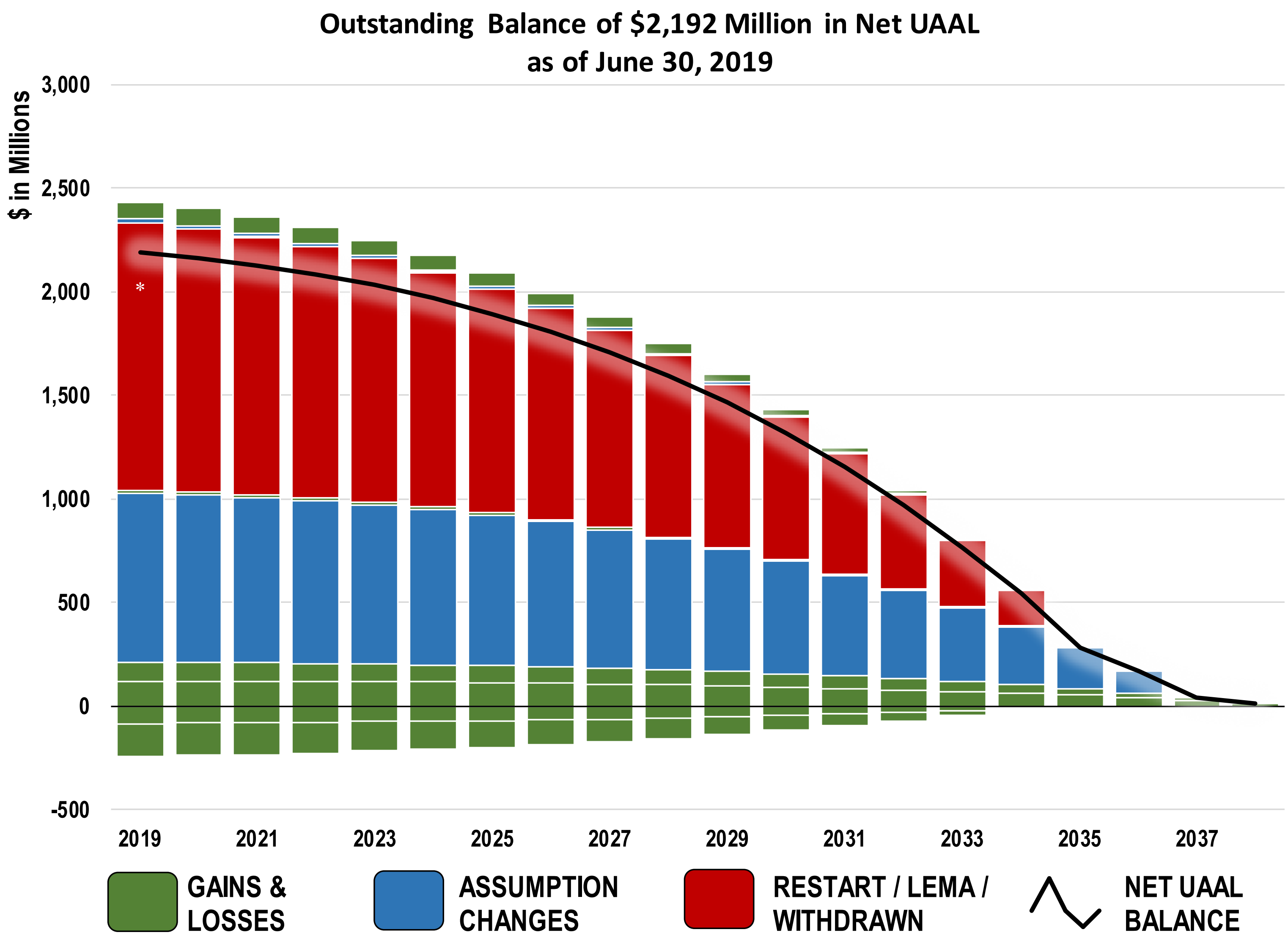
Note: Results may be slightly off due to rounding.

EXHIBIT H – TABLE OF AMORTIZATION BASES (CONTINUED)

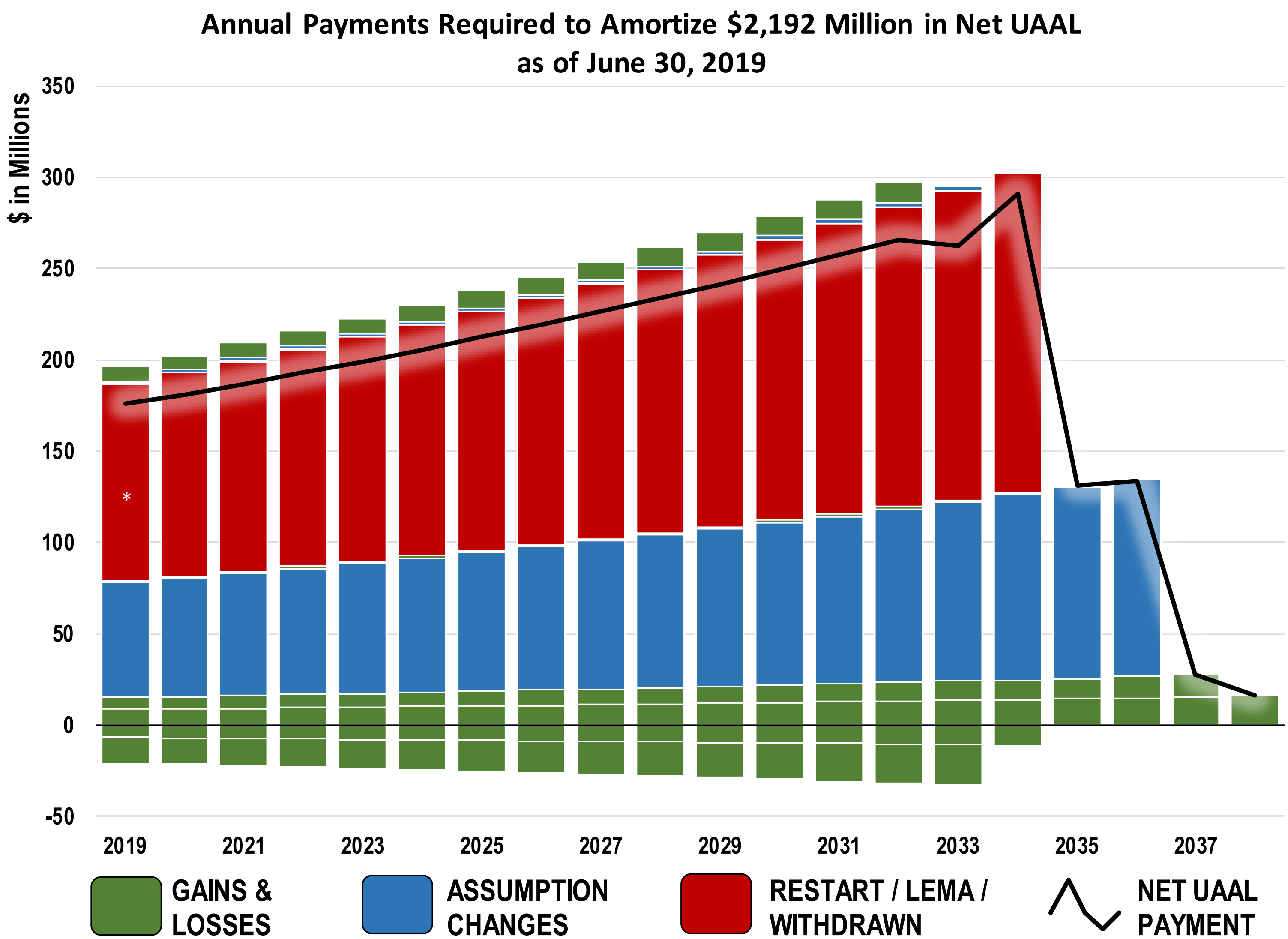
Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment ($ in '000s)
Miscellaneous and Safety Combined						
LEMA	June 30, 2010	$4,047	10	$649	1	$673
Restart amortization	June 30, 2012	1,308,328	23	1,292,461	16	108,029
Actuarial loss	June 30, 2013	87,234	20	82,541	14	7,632
Actuarial gain	June 30, 2014	(165,429)	20	(159,273)	15	(13,972)
Assumption changes	June 30, 2014	15,781	20	15,194	15	1,333
Actuarial gain	June 30, 2015	(82,237)	20	(80,218)	16	(6,705)
Withdrawn employers	June 30, 2015	2,989	20	2,915	16	244
Actuarial loss	June 30, 2016	11,847	20	11,663	17	932
Actuarial gain	June 30, 2017	(2,265)	20	(2,243)	18	(172)
Assumption changes	June 30, 2017	823,711	20	815,745	18	62,584
Actuarial loss	June 30, 2018	90,387	20	90,069	19	6,651
Actuarial loss	June 30, 2019	122,704	20	122,704	20	8,745
Subtotal				**$2,192,207**		**$175,974**

Note: Results may be slightly off due to rounding.

EXHIBIT I – PROJECTION OF UAAL BALANCES AND PAYMENTS



** Restart amortization*



** Restart amortization*

EXHIBIT J – DEFINITION OF PENSION TERMS

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated Normal Costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	Actuarial Present Value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the recommended contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
Actuarially Equivalent:	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund of member contributions or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
Actuarial Value of Assets (AVA):	The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the Plan.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is intended to payoff the Unfunded Actuarial Accrued Liability.

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Plan is calculated, including: Investment return - the rate of investment yield that the Plan will earn over the long-term future; Mortality rates - the rate or probability of death at a given age for employees and pensioners; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the rate or probability of disability retirement at a given age; Withdrawal rates - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Experience Study:	A periodic review and analysis of the actual experience of the Plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.
Funded Ratio:	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
Investment Return:	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Normal Cost:	The portion of the Actuarial Present Value of Future Benefits allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.

Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.
Valuation Value of Assets:	The Actuarial Value of Assets reduced by the value of non-valuation reserves.

EXHIBIT I – ACTUARIAL ASSUMPTIONS AND METHODS

Rationale for Assumptions	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the July 1, 2013 through June 30, 2016 Actuarial Experience Study report dated May 8, 2017. Unless otherwise noted, all actuarial assumptions and methods shown below apply to all tiers. These assumptions were adopted by the Board.
Economic Assumptions	
Net Investment Return:	7.00%; net of administrative and investment expenses. Based on the Actuarial Experience Study reference above, expected administrative and investment expenses represent about 0.65% of the Actuarial Value of Assets.
Employee Contribution Crediting Rate:[1]	3.00% (assumed rate of inflation), compounded semi-annually. *[1] Current policy is to credit the member contribution account with interest up to the current 5-year Treasury rate, if such earnings are available. However, the difference in earnings between the 5-year Treasury rate and the target crediting rate will be applied to the other valuation reserves so that the overall valuation reserve target crediting rate is maintained at 7.00%.*
Consumer Price Index:	Increase of 3.00% per year. Miscellaneous and Safety Tier 1 benefits are assumed to increase at 3.00% per year. Miscellaneous Tier 3, Tier 4 and Tier 5 and Safety Tier 2, Tier 3 and Tier 4 benefits are assumed to increase at 2.00% per year. Miscellaneous Tier 2 receive no COLA increases.
Payroll Growth:	Inflation of 3.00% per year plus real "across the board" salary increases of 0.25% per year, used to amortize the Unfunded Actuarial Accrued Liability as a level percentage of payroll.
Increase in Section 7522.10 Compensation Limit:	Increase of 3.00% per year from the valuation date.

Salary Increases:

The annual rate of compensation increase includes: inflation at 3.00%, plus “across the board” salary increases of 0.25% per year, plus the following merit and promotion increases:

Merit and Promotion Increases

Years of Service	Rate (%)	
	Miscellaneous	Safety
Less than 1	5.00	7.50
1 – 2	4.75	7.25
2 – 3	4.50	6.50
3 – 4	4.00	5.50
4 – 5	3.50	5.00
5 – 6	2.75	4.25
6 – 7	2.25	3.75
7 – 8	2.00	3.25
8 – 9	1.75	3.00
9 – 10	1.50	2.50
10 & Over	1.25	2.00

Demographic Assumptions

Post-Retirement Mortality Rates:

Healthy

- **Miscellaneous Members and All Beneficiaries:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional scale MP-2016 set forward one year for males and no age adjustment for females.
- **Safety Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional scale MP-2016 set back four years for males and females.

Disabled

- **Miscellaneous Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional scale MP-2016 set forward seven years for males and set forward eight years for females.
- **Safety Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional scale MP-2016 set forward four years for males and females.

The RP-2014 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. The generational projection is a provision for future mortality improvement.

Pre-Retirement Mortality Rates:	• **Miscellaneous and Safety Members:** Headcount-Weighted RP-2014 Employee Mortality Table multiplied by 50%, projected generationally with the two-dimensional MP-2016 projection scale.

	Rate (%)			
	Miscellaneous[1]		Safety[1]	
Age	Male	Female	Male	Female
20				
25	0.03	0.01	0.03	0.01
30	0.03	0.01	0.03	0.01
35	0.03	0.02	0.03	0.02
40	0.04	0.02	0.04	0.02
45	0.06	0.04	0.06	0.04
50	0.10	0.06	0.10	0.06
55	0.17	0.10	0.17	0.10
60	0.28	0.15	0.28	0.15
65	0.49	0.22	0.49	0.22

All Miscellaneous pre-retirement deaths are assumed to be non-duty.

For Safety, 50% of pre-retirement deaths are assumed to be non-duty and the rest are assumed to be duty.

(1) Generational projections beyond the base year (2014) are not reflected in the above mortality rates.

Mortality Rates for Member Contributions:	• **Miscellaneous Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP-2016 set forward one year for males and no age adjustment for females weighted 40% male and 60% female. • **Safety Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional scale MP-2016 set back four years for males and females weighted 75% male and 25% female.

Assumptions for Optional Form of Benefits:	• **Miscellaneous Service Retirees:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP-2016 set forward one year for males and no age adjustment for females weighted 40% male and 60% female. • **Safety Service Retirees:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional scale MP-2016 set back four years for males and females weighted 75% male and 25% female. • **Miscellaneous Disabled Retirees:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP-2016 set forward seven years for males and set forward eight years for females weighted 40% male and 60% female. • **Safety Disabled Retirees:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected generationally with the two-dimensional scale MP-2016 set forward four years for males and females weighted 75% male and 25% female. • **All Miscellaneous Beneficiaries:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP-2016 set forward one year for males and no age adjustment for females weighted 60% male and 40% female. • **All Safety Beneficiaries:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP-2016 set forward one year for males and no age adjustment for females weighted 25% male and 75% female. • Note that for optional form of benefits, a 7.00% per annum interest rate with a 0.00% COLA is used.
Disability Incidence:	(see table below)

Disability Incidence

	Rate (%)	
Age	**Miscellaneous**	**Safety**
20	0.00	0.10
25	0.01	0.10
30	0.03	0.16
35	0.05	0.32
40	0.08	0.43
45	0.13	0.51
50	0.21	0.76
55	0.34	0.96
60	0.46	1.30

30% of Miscellaneous disabilities are assumed to be duty disabilities. The other 70% are assumed to be non-duty disabilities.

90% of Safety disabilities are assumed to be duty disabilities. The other 10% are assumed to be non-duty disabilities.

Termination:

Termination (< 5 Years of Service)		
	Rate (%)	
Years of Service	Miscellaneous	Safety
Less than 1	13.00	6.00
1 – 2	8.00	5.00
2 – 3	7.00	4.00
3 – 4	6.00	3.00
4 – 5	5.50	3.00

65% of the Miscellaneous terminated members and 50% of the Safety terminated members with less than 5 years of service are assumed to choose a refund of contributions. The other 35% and 50% of Miscellaneous and Safety terminated members, respectively, are assumed to choose a deferred vested benefit.

Termination (5+ Years of Service)		
	Rate (%)	
Age	Miscellaneous	Safety
20	5.50	2.50
25	5.50	2.50
30	5.20	2.20
35	4.40	1.70
40	3.40	1.35
45	2.70	1.10
50	2.44	1.00
55	2.34	1.00
60	2.24	1.00
65	1.48	0.00

40% of the Miscellaneous terminated members and 15% of the Safety terminated members with 5 or more years of service are assumed to choose a refund of contributions. The other 60% and 85% of Miscellaneous and Safety terminated members are assumed to choose a deferred vested benefit.

No termination is assumed after a member is assumed to retire.

Retirement Rates:

Age	Retirement Rates (%) Miscellaneous Tier 1	Miscellaneous Tiers 2 & 3	Miscellaneous Tier 4	Miscellaneous Tier 5
50	6.00	2.00	2.00	0.00
51	4.50	2.00	2.00	0.00
52	4.50	2.00	2.00	4.00
53	4.50	3.00	2.00	1.50
54	5.50	4.00	3.00	2.50
55	12.00	6.00	4.00	3.50
56	18.00	6.00	5.00	4.50
57	18.00	8.00	6.00	5.50
58	18.00	10.00	7.00	6.50
59	20.00	12.00	8.00	7.50
60	28.00	12.00	9.00	8.50
61	35.00	14.00	10.00	9.50
62	35.00	25.00	18.00	17.00
63	35.00	25.00	16.00	15.00
64	35.00	30.00	20.00	19.00
65	35.00	35.00	25.00	24.00
66	40.00	40.00	20.00	20.00
67	40.00	40.00	20.00	20.00
68	50.00	50.00	30.00	30.00
69	60.00	60.00	40.00	40.00
70 & Over	100.00	100.00	100.00	100.00

Retirement Rates (continued):

Age	Retirement Rates (%) Safety Tiers 1 & 2	Safety Tier 3	Safety Tier 4
45	2.00	1.50	0.00
46	2.00	1.50	0.00
47	2.00	1.50	0.00
48	2.00	1.50	0.00
49	5.00	4.00	0.00
50	22.00	10.00	15.00
51	16.00	12.00	10.50
52	16.00	14.00	12.00
53	20.00	16.00	14.00
54	20.00	18.00	15.50
55	20.00	50.00	40.00
56	25.00	25.00	25.00
57	25.00	25.00	25.00
58	25.00	25.00	25.00
59	30.00	30.00	25.00
60	45.00	45.00	45.00
61	55.00	55.00	55.00
62	70.00	70.00	70.00
63	70.00	70.00	70.00
64	70.00	70.00	70.00
65 & Over	100.00	100.00	100.00

Retirement Age and Benefit for Deferred Vested Members:

Miscellaneous Retirement Age: 59

Safety Retirement Age: 53

Future deferred vested members who terminate with less than five years of service and are not vested are assumed to retire at age 70 for both Miscellaneous and Safety if they decide to leave their contributions on deposit.

35% of future Miscellaneous and 45% of future Safety deferred vested members are assumed to continue to work for a reciprocal employer. For reciprocals, 4.50% and 5.25% compensation increases are assumed per annum for Miscellaneous and Safety, respectively.

Future Benefit Accruals:

1.0 year of service per year for the full-time employees. Continuation of current partial service accrual for part-time employees.

Unknown Data for Members:

Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

Definition of Active Members:	All active members of SCERS as of the valuation date.
Form of Payment:	All active and inactive members are assumed to elect the unmodified option at retirement.
Percent Married:	For all active and inactive members, 80% of male members and 55% of female members are assumed to be married at pre-retirement death or retirement.
Age and Gender of Spouse:	For all active and inactive members, male members are assumed to have a female spouse who is 3 years younger than the member and female members are assumed to have a male spouse who is 2 years older than the member.
Service from Unused Sick Leave Conversion:	The following assumptions for service converted from unused sick leave as a percentage of service at retirement are used:

	Service Retirement	Disability Retirement
Miscellaneous	1.50%	0.25%
Safety	2.25%	0.25%

Pursuant to Section 31641.01, the cost of this benefit will be charged only to employers and will not affect member contribution rates.

Actuarial Funding Policy	
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is the age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation.
Actuarial Value of Assets:	Market Value of Assets (MVA) less unrecognized returns in each of the last seven years. Unrecognized returns are equal to the difference between the actual market return and the expected return on the market value, and are recognized over a seven-year period. The Actuarial Value of Assets (AVA) is limited by a 30% corridor; the AVA cannot be less than 70% of MVA, nor greater than 130% of MVA.
Valuation Value of Assets:	The Actuarial Value of Assets reduced by the value of the non-valuation reserves and designations.

Amortization Policy:	The UAAL established as a result of the Early Retirement Incentive Program for LEMA members is amortized over a 10-year period beginning June 30, 2010. The balance of the UAAL as of June 30, 2012 shall be amortized separately from any future changes in UAAL over a period of 23 years from June 30, 2012. Any new UAAL as a result of actuarial gains or losses identified in the annual valuation as of June 30 will be amortized over a period of 20 years. Any new UAAL as a result of change in actuarial assumptions or methods will be amortized over a period of 20 years. The change in UAAL as a result of any plan amendments will be amortized over a period of 15 years and the change in UAAL resulting from retirement incentive programs will be amortized over a period of up to 5 years.
<u>Other Actuarial Methods</u>	
Employer Contributions:	Employer contributions consist of two components: *Normal Cost* The annual contribution rate that, if paid annually from a member's first year of membership through the year of retirement, would accumulate to the amount necessary to fully fund the member's retirement-related benefits. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution rate is expressed as a level percentage of the member's compensation. *Contribution to the Unfunded Actuarial Accrued Liability (UAAL)* The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution (or rate credit in the case of a negative UAAL) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the System) assuming a constant number of active members. In order to remain as a level percentage of payroll, amortization payments (credits) are scheduled to increase at the annual rate of 3.25% (i.e., 3.00% inflation plus 0.25% across-the-board salary increase). Starting with the June 30, 2015 valuation, we have added to the Miscellaneous employer UAAL rate for the County an amount to reflect the net withdrawal liability for the Library Authority and Air Quality Districts when they terminated their affiliation with the County and became special districts. The amortization policy is described above. The recommended employer contributions are provided in *Section 2, Subsection F.* Employer Normal Cost and UAAL contribution rates are calculated assuming payments made at the end of every pay period.

Member Contributions:	*Miscellaneous Tiers 1, 2, 3 & 4 and Safety Tiers 1, 2, & 3* Articles 6 and 6.8 of the 1937 Act define the methodology to be used in the calculation of member basic contribution rates for Miscellaneous members and Safety members, respectively, in the legacy tiers. The basic contribution rate is determined as that percentage of compensation which if paid annually from a member's first year of membership through the prescribed retirement age would accumulate to the amount necessary to fund a prescribed annuity. The annuity is equal to: • 1/240 of Final Average Salary per year of service at age 55 for current Miscellaneous Tier 1, Tier 2 and Tier 3 members • 1/120 of Final Average Salary per year of service at age 60 for current Miscellaneous Tier 4 members • 1/100 of Final Average Salary per year of service at age 50 for current Safety Tier 1, Tier 2 and Tier 3 members In addition to their basic contributions, members in the legacy tiers pay one-half of the total Normal Cost necessary to fund their cost-of-living benefits. The cost to provide the cost-of-living benefits is offset somewhat by the balance available in an account maintained in the valuation to offset member's COLA rates in the legacy tiers. Accumulation includes semi-annual crediting of interest at one-half of the United States 5-year Treasury rate for the last business day of the interest crediting period. For members paying half rates prior to the June 30, 2015 valuation, their rates should be exactly one-half of the rates described above. Note that effective with the June 30, 2015 valuation, all members are reported as paying at least full-rate. Starting in 2014-2015, most County members in the legacy tiers agreed to contribute either 1/3, 1/4, or 1/5 of the difference between the employee's then current Normal Cost and 50% of the total Normal Cost rate. Those members agreed to contribute an additional 1/3, 1/4, or 1/5 of the difference in the Normal Cost rate in 2015-2016, 2016-2017 and 2017-2018. For Rep Unit 26 Miscellaneous members, the member rates they started to contribute in 2015-2016 were 1% of payroll higher than the rates they paid in 2014-2015. In developing their rates for 2016-2017, we added an additional 2% of payroll to the rates for 2015-2016. For Orangevale Recreation and Park District members, the member rates they started to contribute in 2015-2016 were 1/2 of the difference between the employee's then current Normal Cost and 50% of the total Normal Cost rate. Those members agreed to contribute an additional 1/2 of the difference in the Normal Cost rate in 2016-2017. For Rep Unit 16 Miscellaneous members, the member rates effective January 1, 2018 are 1/2 of the difference between the employee's then current Normal Cost and 50% of the total Normal Cost rate. Those members have agreed to contribute an additional 1/4 of the difference in the Normal Cost rate in 2018-2019 and 2019-2020. For Rep Unit 25 Miscellaneous members, the member rates effective January 1, 2018 are 2% of payroll higher than the employees' then current Normal Cost. These members have agreed to contribute an additional 2% of payroll in 2018-2019 and to contribute 50% of the total Normal Cost rate in 2019-2020.

Member Contributions (continued):	Effective in 2019-2020, all of the above members who have previously agreed to contribute a higher Normal Cost rate are paying 50% of the total Normal Cost rate. *Miscellaneous Tier 5 and Safety Tier 4* Pursuant to Section 7522.30(a) of the Government Code, Miscellaneous Tier 5 and Safety Tier 4 members are required to contribute at least 50% of the Normal Cost rate. In addition, there are certain additional requirements that would have to be met such as requiring the new employees to pay the contribution rate of “similarly situated employees”, if it is greater. (reference: Section 7522.30(c)). We further understand that different rules may have to be applied for collectively bargained employees, non-represented, managerial or other supervisory employees. (reference: Section 7522.30(e)). In preparing the Normal Cost rates in this report, we have assumed that exactly 50% of the Normal Cost would be paid by the new members and we have taken into account in this valuation only the requirements of Section 7522.30(c), but not requirements of Section 7522.30(e). The member contribution rates for all members are provided in *Section 4, Exhibit III*. Member contributions are assumed to be made at the end of every pay period.
Internal Revenue Code Section 415:	Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual’s account in a defined contribution plan. A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active participants could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan’s assets. In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar limit of $160,000 indexed for inflation. That limit is $220,000 for 2018 and $225,000 for 2019. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must be adjusted based on each participant’s circumstances, for such things as age at retirement, form of benefits chosen and after tax contributions. Non-CalPEPRA benefits in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m). Legal Counsel’s review and interpretation of the law and regulations should be sought on any questions in this regard. Contribution rates determined in this valuation have not been reduced for the Section 415 limitations. However, it is anticipated that PEPRA members will not be limited in the future due to the PEPRA compensation limit applied in the determination of their benefit. Actual limitations will result in gains as they occur.
Changed Actuarial Assumptions:	There have been no changes in actuarial assumptions since the last valuation.

EXHIBIT II – SUMMARY OF PLAN PROVISIONS

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	July 1 through June 30
Membership Eligibility:	Membership with SCERS usually begins with the employment by the County or member District as a permanent full-time or part-time employee as provided in the County Salary Resolution or the District's Salary Resolution.
Miscellaneous Tier 1	All Miscellaneous members hired prior to September 27, 1981.
Miscellaneous Tier 2 & Tier 3	All Miscellaneous members hired on or after September 27, 1981. Membership into Tier 2 or Tier 3 is determined by date of hire and by bargaining unit.
Miscellaneous Tier 4	All Miscellaneous members hired on or after January 1, 2012 as adopted by the County. Membership into Tier 4 is determined by date of hire.
Miscellaneous Tier 5	All Miscellaneous members hired on or after January 1, 2013.
Safety Tier 1 & Tier 2	Membership into Tier 1 or Tier 2 for Safety employee is determined by date of hire and by bargaining unit.
Safety Tier 3	All Safety members hired on or after January 1, 2012 as adopted by the County. Membership into Tier 3 is determined by date of hire.
Safety Tier 4	All Safety members hired on or after January 1, 2013.
Final Compensation for Benefit Determination:	
Miscellaneous and Safety Tier 1	Highest consecutive 1 year (12 months) of compensation earnable (§31462.1) (FAS1).
Miscellaneous Tier 2, Tier 3, & Tier 4 and Safety Tier 2 & Tier 3	Highest consecutive 3 years (36 months) of compensation earnable. (§31462) (FAS3).
Miscellaneous Tier 5 and Safety Tier 4	Highest consecutive 3 years (36 months) of pensionable compensation. (§7522.10(c), §7522.32 and §7522.34) (FAS3).
Service:	Years of service (Yrs).

Service Retirement Eligibility:	
Miscellaneous	
Tiers 1, 2, 3 & 4	Age 50 with 10 years of service, or age 70 regardless of service, or after 30 years regardless of age (§31672).
Tier 5	Age 52 with 5 years of service (§7522.20(a)) or age 70 regardless of service (§31672.3).
Safety	
Tiers 1, 2 & 3	Age 50 with 10 years of service, or age 70 regardless of service, or after 20 years of Safety service regardless of age (§31663.25).
Tier 4	Age 50 with 5 years of service (§7522.25(d)) or age 70 regardless of service (§31672.3).

Benefit Formula:

	Retirement Age	Benefit Formula
Miscellaneous Tier 1 (§31676.14)	**Retirement Age**	**Benefit Formula**
	50	(1.48% x FAS1 – 1/3 x 1.48% x $350 x 12) x Yrs
	55	(1.95% x FAS1 – 1/3 x 1.95% x $350 x 12) x Yrs
	60	(2.44% x FAS1 – 1/3 x 2.44% x $350 x 12) x Yrs
	62 & Over	(2.61% x FAS1 – 1/3 x 2.61% x $350 x 12) x Yrs
Miscellaneous Tier 2 & Tier 3 (§31676.14)	**Retirement Age**	**Benefit Formula**
	50	(1.48% x FAS3 – 1/3 x 1.48% x $350 x 12) x Yrs
	55	(1.95% x FAS3 – 1/3 x 1.95% x $350 x 12) x Yrs
	60	(2.44% x FAS3 – 1/3 x 2.44% x $350 x 12) x Yrs
	62 & Over	(2.61% x FAS3 – 1/3 x 2.61% x $350 x 12) x Yrs
Miscellaneous Tier 4 (§31676.1)	**Retirement Age**	**Benefit Formula**
	50	(1.18% x FAS3 – 1/3 x 1.18% x $350 x 12) x Yrs
	55	(1.49% x FAS3 – 1/3 x 1.49% x $350 x 12) x Yrs
	60	(1.92% x FAS3 – 1/3 x 1.92% x $350 x 12) x Yrs
	62	(2.09% x FAS3 – 1/3 x 2.09% x $350 x 12) x Yrs
	65 & Over	(2.43% x FAS3 – 1/3 x 2.43% x $350 x 12) x Yrs

Miscellaneous Tier 5 (§7522.20(a))	**Retirement Age**	**Benefit Formula**
	52	1.00% x FAS3 x Yrs
	55	1.30% x FAS3 x Yrs
	60	1.80% x FAS3 x Yrs
	62	2.00% x FAS3 x Yrs
	65	2.30% x FAS3 x Yrs
	67 & Over	2.50% x FAS3 x Yrs
Safety Tier 1 (§31664.1)	**Retirement Age**	**Benefit Formula**
	50 & Over	(3.00% x FAS1 – 1/3 x 3.00% x $350 x 12) x Yrs
Safety Tier 2 (§31664.1)	**Retirement Age**	**Benefit Formula**
	50 & Over	(3.00% x FAS3 – 1/3 x 3.00% x $350 x 12) x Yrs
Safety Tier 3 (§31664.2)	**Retirement Age**	**Benefit Formula**
	50	(2.29% x FAS3 – 1/3 x 2.29% x $350 x 12) x Yrs
	55 & Over	(3.00% x FAS3 – 1/3 x 3.00% x $350 x 12) x Yrs
Safety Tier 4 (§7522.25(d))	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAS3 x Yrs
	55	2.50% x FAS3 x Yrs
	57 & Over	2.70% x FAS3 x Yrs

Maximum Benefit:	
Miscellaneous Tier 1, Tier 2, Tier 3 & Tier 4 and Safety Tier 1, Tier 2 and Tier 3	100% of Highest Average Compensation (§31676.14, §31676.1, §31664.1, §31664.2).
Miscellaneous Tier 5 and Safety Tier 4	None.

Additional Benefit Information:	For Miscellaneous members of the following Districts, benefits accrued before June 29, 2003 will continue to be calculated using §31676.1. • Fair Oaks Cemetery District • Galt Arno Cemetery District
Non-Duty Disability:	
Miscellaneous Tier 1 and Safety Tier 1	
Eligibility	Five years of service (§31720).
Benefit Formula	1.5% per year of service for Miscellaneous Tier 1 and 1.8% per year of service for Safety Tier 1. If the benefit does not exceed one-third of Final Compensation, the service is projected to 65 for Miscellaneous Tier 1 and 55 for Safety Tier 1, but the total projected benefit cannot be more than one-third of Final Compensation (§31727 and §31727.2). The Service Retirement benefit is payable, if greater.
Miscellaneous Tier 2, Tier 3, Tier 4, & Tier 5 and *Safety Tier 2, Tier 3 & Tier 4*	
Eligibility	Five years of service (§31720).
Benefit Formula	20% of Final Compensation for the first five years of service plus 2% for each year of additional service for a maximum of 40% of Final Compensation (§31727.7). The Service Retirement benefit is payable, if greater.
Line-of-Duty Disability:	
All Members	
Eligibility	No age or service requirements (§31720).
Benefit Formula	50% of the Final Compensation or 100% of Service Retirement benefit, if greater (§31727.4).

Pre-Retirement Death:	
All Members	
Eligibility	No age or service requirements.
Basic lump sum benefit	Refund of employee contributions with interest, plus one month's compensation for each year of service, to a maximum of six month's compensation (§31781).
Death in line-of-duty	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).
Vested Members	
Eligibility	Five years of service.
Basic benefit	60% of the greater of Service Retirement or Non-Duty Disability Retirement benefit payable to surviving eligible spouse (§31765.1, §31781.1), in lieu of the basic lump sum benefit above.
Death in line-of-duty	50% of Final compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).
Death After Retirement:	
All Members	
Service Retirement or Non-Duty Disability Retirement	Unless another option was selected at retirement, 60% of member's unmodified allowance continues to eligible spouse (§31760.1) and an additional $4,000 lump sum benefit is payable to member's beneficiary (§31789.3). An eligible spouse is a surviving spouse who was married to the member at least one year prior to the date of retirement (§31760.1).
Line-of-Duty Disability	Unless another option was selected at retirement, 100% of member's allowance continued to eligible spouse (§31786) and an additional $4,000 lump sum benefit is payable to member's beneficiary (§31789.3). An eligible spouse is a surviving spouse who was married to the member at least one year prior to the date of retirement (§31760.1).
Withdrawal Benefits:	
Less than Five Years of Service	Refund of accumulated employee contributions with interest, or benefit at age 70 (§31628). Effective January 1, 2003, a member may also elect to leave contributions on deposit in the retirement fund (§31629.5).
Five or More Years of Service	If contributions left on deposit, entitled to earned benefits commencing at any time after eligible to retire (§31700).

Post-Retirement Cost-of-Living Benefits:	
Miscellaneous Tier 1 and Safety Tier 1	Annual adjustment based on Consumer Price Index to a maximum of 4% per year; excess “banked” (§31870.3).
Miscellaneous Tier 2	None.
Miscellaneous Tier 3, Tier 4 & Tier 5 and Safety Tier 2, Tier 3 & Tier 4	Annual adjustment based on Consumer Price Index to a maximum of 2% per year; excess “banked” (§31870).
Member Contributions:	Please refer to *Section 4, Exhibit III* for specific rates.
Miscellaneous Tier 1	
Basic	Entry-age based rates that provide for an annuity at age 55 equal to 1/240 of FAS1 (§31621.3).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
Miscellaneous Tier 2	
Basic	Entry-age based rates that provide for an annuity at age 55 equal to 1/240 of FAS3 (§31621.3).
Cost-of-Living	None.
Miscellaneous Tier 3	
Basic	Entry-age based rates that provide for an annuity at age 55 equal to 1/240 of FAS3 (§31621.3).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
Miscellaneous Tier 4	
Basic	Entry-age based rates that provide for an annuity at age 60 equal to 1/120 of FAS3 (§31621).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
Miscellaneous Tier 5	50% of the total Normal Cost rate.
Safety Tier 1, Tier 2 & Tier 3	
Basic	Entry-age based rates that provide for an annuity at age 50 equal to 1/100 of FAS1 (FAS3 for Tier 2 and Tier 3). (§31639.25).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
Safety Tier 4	50% of the total Normal Cost rate.
Notes	• The above rates are known as full rates. For members paying half rates prior to the June 30, 2015 valuation, their rates should be one-half of the rates provided in this report. Note that effective with the June 30, 2015

Member Contributions (continued):	valuation, all members are reported as paying at least full-rate. In addition, for members entering the plan on or after January 1, 1975, they pay a rate based on a single entry age (§31621.11 and §31639.26). • Starting in 2014-2015, most County members in the legacy tiers agreed to contribute either 1/3, 1/4, or 1/5 of the difference between the employee's then current Normal Cost and 50% of the total Normal Cost rate. Those members agreed to contribute an additional 1/3, 1/4, or 1/5 of the difference in the Normal Cost rate in 2015-2016, 2016-2017 and 2017-2018. • For Rep Unit 26 Miscellaneous members, the member rates they started to contribute in 2015-2016 were 1% of payroll higher than the rates they paid in 2014-2015. In developing their rates for 2016-2017, we added an additional 2% of payroll to the rates for 2015-2016. • For Orangevale Recreation and Park District members, the member rates they started to contribute in 2015-2016 were 1/2 of the difference between the employee's then current Normal Cost and 50% of the total Normal Cost rate. Those members agreed to contribute an additional 1/2 of the difference in the Normal Cost rate in 2016-2017. • For Rep Unit 16 Miscellaneous members, the member rates effective January 1, 2018 are 1/2 of the difference between the employee's then current Normal Cost and 50% of the total Normal Cost rate. Those members have agreed to contribute an additional 1/4 of the difference in the Normal Cost rate in 2018-2019 and 2019-2020. • For Rep Unit 25 Miscellaneous members, the member rates effective January 1, 2018 are 2% of payroll higher than the employees' then current Normal Cost. These members have agreed to contribute an additional 2% of payroll in 2018-2019 and to contribute 50% of the total Normal Cost rate in 2019-2020. • Effective in 2019-2020, all of the above members who have previously agreed to contribute a higher Normal Cost rate are paying 50% of the total Normal Cost rate.
Other Information:	Safety Tier 1, Tier 2 & Tier 3 members with 30 or more years of service are exempt from paying member contributions. The same applies for Miscellaneous members hired on or before March 7, 1973.
Changed Plan Provisions:	There have been no changes in plan provisions since the last valuation.

Note: The summary of major plan provisions is designed to outline principal plan benefits as interpreted for purposes of the actuarial valuation. If the System should find the plan summary not in accordance with the actual provisions, the System should alert the actuary so they can both be sure the proper provisions are valued.

EXHIBIT III – MEMBER CONTRIBUTION RATES

Comparison of Member Rate[1] from the June 30, 2018 and June 30, 2019 Valuations

Contribution rates for most Miscellaneous County members and all Safety County members in the legacy tiers who have agreed to contribute an additional Normal Cost before and after the gross-up for the integration with Social Security can be found in *Section 4, Exhibit VI*.

	June 30, 2019			June 30, 2018			Increase / (Decrease) in Rate
Miscellaneous	Basic	COLA	Total	Basic	COLA	Total	
Tier 1	4.05%	1.93%	5.98%	4.05%	1.86%	5.91%	0.07%
Tier 2	3.87%	0.00%	3.87%	3.87%	0.00%	3.87%	0.00%
Tier 3	3.87%	1.64%	5.51%	3.87%	1.67%	5.54%	-0.03%
Tier 4	6.82%	1.54%	8.36%	6.82%	1.55%	8.37%	-0.01%
Tier 5	7.80%	1.65%	9.45%	7.80%	1.65%	9.45%	0.00%
	June 30, 2019			**June 30, 2018**			**Increase / (Decrease) in Rate**
Safety	**Basic**	**COLA**	**Total**	**Basic**	**COLA**	**Total**	
Tier 1	11.15%	8.69%	19.84%	11.15%	8.34%	19.49%	0.35%
Tier 2	10.60%	4.19%	14.79%	10.60%	4.17%	14.77%	0.02%
Tier 3	10.60%	3.75%	14.35%	10.60%	3.73%	14.33%	0.02%
Tier 4	11.74%	3.23%	14.97%	11.84%	3.25%	15.09%	-0.12%

(1) Members who enter on or after 1/1/1975 contribute as indicated above and all others contribute the rate at their respective entry ages.

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Miscellaneous Tier 1 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

Miscellaneous – Tier 1						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
16	2.07%	3.10%	0.99%	1.48%	3.06%	4.58%
17	2.10%	3.15%	1.00%	1.50%	3.10%	4.65%
18	2.13%	3.19%	1.01%	1.52%	3.14%	4.71%
19	2.16%	3.24%	1.03%	1.55%	3.19%	4.79%
20	2.19%	3.28%	1.05%	1.57%	3.24%	4.85%
21	2.22%	3.33%	1.06%	1.59%	3.28%	4.92%
22	2.25%	3.38%	1.07%	1.61%	3.32%	4.99%
23	2.28%	3.42%	1.09%	1.63%	3.37%	5.05%
24	2.31%	3.47%	1.11%	1.66%	3.42%	5.13%
25	2.35%	3.52%	1.12%	1.68%	3.47%	5.20%
26	2.38%	3.57%	1.14%	1.71%	3.52%	5.28%
27	2.41%	3.62%	1.15%	1.73%	3.56%	5.35%
28	2.45%	3.67%	1.17%	1.75%	3.62%	5.42%
29	2.48%	3.72%	1.19%	1.78%	3.67%	5.50%
30	2.51%	3.77%	1.20%	1.80%	3.71%	5.57%
31	2.55%	3.82%	1.21%	1.82%	3.76%	5.64%
32	2.59%	3.88%	1.23%	1.85%	3.82%	5.73%
33	2.62%	3.93%	1.25%	1.88%	3.87%	5.81%
34	2.66%	3.99%	1.27%	1.91%	3.93%	5.90%
35	2.70%	4.05%	1.29%	1.93%	3.99%	5.98%
36	2.74%	4.11%	1.31%	1.96%	4.05%	6.07%
37	2.78%	4.17%	1.33%	1.99%	4.11%	6.16%
38	2.82%	4.23%	1.35%	2.02%	4.17%	6.25%
39	2.86%	4.29%	1.37%	2.05%	4.23%	6.34%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Miscellaneous – Tier 1 (continued)						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
40	2.91%	4.36%	1.39%	2.08%	4.30%	6.44%
41	2.95%	4.42%	1.41%	2.11%	4.36%	6.53%
42	2.99%	4.49%	1.43%	2.14%	4.42%	6.63%
43	3.05%	4.57%	1.45%	2.18%	4.50%	6.75%
44	3.10%	4.65%	1.48%	2.22%	4.58%	6.87%
45	3.15%	4.72%	1.50%	2.25%	4.65%	6.97%
46	3.19%	4.79%	1.53%	2.29%	4.72%	7.08%
47	3.23%	4.85%	1.55%	2.32%	4.78%	7.17%
48	3.27%	4.91%	1.57%	2.35%	4.84%	7.26%
49	3.31%	4.96%	1.58%	2.37%	4.89%	7.33%
50	3.32%	4.98%	1.59%	2.38%	4.91%	7.36%
51	3.32%	4.98%	1.59%	2.38%	4.91%	7.36%
52	3.31%	4.97%	1.58%	2.37%	4.89%	7.34%
53	3.30%	4.95%	1.57%	2.36%	4.87%	7.31%
54	3.28%	4.92%	1.57%	2.35%	4.85%	7.27%
55	3.28%	4.92%	1.57%	2.35%	4.85%	7.27%
56	3.28%	4.92%	1.57%	2.35%	4.85%	7.27%
57	3.28%	4.92%	1.57%	2.35%	4.85%	7.27%
58	3.28%	4.92%	1.57%	2.35%	4.85%	7.27%
59 & Over	3.28%	4.92%	1.57%	2.35%	4.85%	7.27%

Note: Members who enter prior to 1/1/1975 contribute on the basis of their actual entry age and all others contribute based on the basis of a single entry age of 35.

Interest:	7.00% per annum
COLA:	3.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	47.77%[(1)]
Non-Refundability Factor:	100.00%

(1) Factors have been adjusted to reflect a reserve carried by the Board to reduce part of the COLA contributions.

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Miscellaneous Tier 2 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

Miscellaneous – Tier 2						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
35	2.58%	3.87%	0.00%	0.00%	2.58%	3.87%

Note: Members who enter on or after 1/1/1975 contribute on the basis of a single entry age of 35.

Interest: 7.00% per annum
COLA: 0.00%
Mortality: See *Section 4, Exhibit I*
Salary Increase: Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor: 0.00%
Non-Refundability Factor: 100.00%

Miscellaneous Tier 3 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

Miscellaneous – Tier 3						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
35	2.58%	3.87%	1.10%	1.64%	3.68%	5.51%

Note: Members who enter on or after 1/1/1975 contribute on the basis of a single entry age of 35.

Interest: 7.00% per annum
COLA: 2.00%
Mortality: See *Section 4, Exhibit I*
Salary Increase: Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor: 42.45%[1]
Non-Refundability Factor: 98.87%

[1] Factors have been adjusted to reflect a reserve carried by the Board to reduce part of the COLA contributions.

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Miscellaneous Tier 4 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

Miscellaneous – Tier 4						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
35	4.55%	6.82%	1.02%	1.54%	5.57%	8.36%

Note: Members who enter on or after 1/1/1975 contribute on the basis of a single entry age of 35.

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	22.52%[1]
Non-Refundability Factor:	97.13%

[1] Factors have been adjusted to reflect a reserve carried by the Board to reduce part of the COLA contributions.

Miscellaneous Tier 5 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

Miscellaneous – Tier 5			
	All Eligible Pay[1]		
	Basic	COLA	Total
All Members	7.80%	1.65%	9.45%

[1] It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2019 is equal to $124,180 (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019 (reference: Section 7522.10(d)).

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	21.15%
Non-Refundability Factor:	94.14%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 1 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

Safety – Tier 1						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
18	6.65%	9.97%	5.18%	7.77%	11.83%	17.74%
19	6.71%	10.06%	5.23%	7.84%	11.94%	17.90%
20	6.78%	10.17%	5.29%	7.93%	12.07%	18.10%
21	6.85%	10.27%	5.34%	8.01%	12.19%	18.28%
22	6.91%	10.37%	5.39%	8.08%	12.30%	18.45%
23	6.99%	10.48%	5.45%	8.17%	12.44%	18.65%
24	7.05%	10.58%	5.50%	8.25%	12.55%	18.83%
25	7.13%	10.69%	5.55%	8.33%	12.68%	19.02%
26	7.20%	10.80%	5.61%	8.42%	12.81%	19.22%
27	7.28%	10.92%	5.67%	8.51%	12.95%	19.43%
28	7.35%	11.03%	5.73%	8.60%	13.08%	19.63%
29	7.43%	11.15%	5.79%	8.69%	13.22%	19.84%
30	7.51%	11.27%	5.86%	8.79%	13.37%	20.06%
31	7.60%	11.40%	5.93%	8.89%	13.53%	20.29%
32	7.69%	11.53%	5.99%	8.99%	13.68%	20.52%
33	7.78%	11.67%	6.07%	9.10%	13.85%	20.77%
34	7.87%	11.81%	6.14%	9.21%	14.01%	21.02%
35	7.97%	11.96%	6.21%	9.32%	14.18%	21.28%
36	8.08%	12.12%	6.30%	9.45%	14.38%	21.57%
37	8.19%	12.28%	6.38%	9.57%	14.57%	21.85%
38	8.31%	12.47%	6.48%	9.72%	14.79%	22.19%
39	8.45%	12.67%	6.59%	9.88%	15.04%	22.55%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety – Tier 1 (continued)						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
40	8.55%	12.83%	6.67%	10.00%	15.22%	22.83%
41	8.63%	12.95%	6.73%	10.10%	15.36%	23.05%
42	8.71%	13.06%	6.79%	10.18%	15.50%	23.24%
43	8.76%	13.14%	6.83%	10.24%	15.59%	23.38%
44	8.79%	13.18%	6.85%	10.28%	15.64%	23.46%
45	8.77%	13.16%	6.84%	10.26%	15.61%	23.42%
46	8.73%	13.10%	6.81%	10.21%	15.54%	23.31%
47	8.65%	12.97%	6.74%	10.11%	15.39%	23.08%
48	8.51%	12.77%	6.64%	9.96%	15.15%	22.73%
49 & Over	8.37%	12.55%	6.52%	9.78%	14.89%	22.33%

Note: Members who enter prior to 1/1/1975 contribute on the basis of their actual entry age and all others contribute based on the basis of a single entry age of 29.

Interest: 7.00% per annum
COLA: 3.00%
Mortality: See *Section 4, Exhibit I*
Salary Increase: Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor: 77.96%[1]
Non-Refundability Factor: 100.00%

[1] Factors have been adjusted to reflect a reserve carried by the Board to reduce part of the COLA contributions.

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 2 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

Safety – Tier 2						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
29	7.07%	10.60%	2.79%	4.19%	9.86%	14.79%

Note: Members who enter on or after 1/1/1975 contribute on the basis of a single entry age of 29.

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	39.57%[(1)]
Non-Refundability Factor:	99.82%

Safety Tier 3 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

Safety – Tier 3						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
29	7.07%	10.60%	2.50%	3.75%	9.57%	14.35%

Note: Members who enter on or after 1/1/1975 contribute on the basis of a single entry age of 29.

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	35.39%[(1)]
Non-Refundability Factor:	99.37%

(1) Factors have been adjusted to reflect a reserve carried by the Board to reduce part of the COLA contributions.

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 4 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)

	Safety – Tier 4		
	All Eligible Pay[1]		
	Basic	COLA	Total
All Members	11.74%	3.23%	14.97%

[1] It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2019 is equal to $124,180 (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019 (reference: Section 7522.10(d)).

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.25%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	27.51%
Non-Refundability Factor:	98.52%

EXHIBIT IV – CALCULATION OF ADDITIONAL DISTRICT RATE AS OF JUNE 30, 2019 FOR CERTAIN DISTRICT EMPLOYERS

Additional contributions were made by the County to buy down the County and Superior Court UAAL contribution rate through the issuance of Pension Obligation Bonds (POB). As the other district employers did not participate in the POBs, their rates as calculated on page 35 of this report have been increased to reflect that they did not buy down their UAAL rates.

The calculation of the additional District rate as of June 30, 2019 is as follows:

June 30, 2018 POB Balance	$31,446,393
Additional Rate in June 30, 2018 Valuation	7.90%
June 30, 2018 Projected District Payroll(1)	$31,832,000
June 30, 2019 POB Balance(2)	$31,044,897
16-Year Amortization	0.083584
June 30, 2019 Projected District Payroll(1)	$31,606,000
Additional Rate in June 30, 2019 Valuation(3)	8.21%

(1) Excluding the payroll for Rio Linda Elverta Recreation and Parks District.

(2) Equal to $31,446,393 * 1.07 – 7.90% * $31,832,000 * (1+0.07/2).

(3) Equal to $31,044,897 * 0.083584 / $31,606,000.

EXHIBIT V – DETAILED DISTRICT RATES AS OF JUNE 30, 2019

Recommended employer contribution rates for District Only (After 3-Year Phase-In):

Special Districts with All Service Improvement Only						
	Member Paying Full Rate (% of Payroll)			Member Paying 50:50 Rate (% of Payroll)		
	Tier 1[(1)]	Tier 3[(1)]	Tier 5	Tier 1[(2)]	Tier 3[(2)]	Tier 5[(3)]
Normal Cost	13.50%	15.54%	N/A	N/A	10.69%	9.45%
UAAL	18.64%	18.64%	N/A	N/A	18.64%	18.64%
Total	32.14%	34.18%	N/A	N/A	29.33%	28.09%

Special Districts with Future Service Improvement Only[(4)]						
	Member Paying Full Rate (% of Payroll)			Member Paying 50:50 Rate (% of Payroll)		
	Tier 1	Tier 3	Tier 5	Tier 1	Tier 3	Tier 5
Normal Cost	N/A	15.54%	N/A	N/A	N/A	9.45%
UAAL	N/A	14.10%	N/A	N/A	N/A	14.10%
Total	N/A	29.64%	N/A	N/A	N/A	23.55%

Rio Linda Elverta Recreation and Parks District						
	Member Paying Full Rate (% of Payroll)			Member Paying 50:50 Rate (% of Payroll)		
	Tier 1	Tier 3	Tier 5	Tier 1	Tier 3	Tier 5
Normal Cost	N/A	N/A	N/A	N/A	N/A	9.45%
UAAL	N/A	N/A	N/A	N/A	N/A	0.82%
Total	N/A	N/A	N/A	N/A	N/A	10.27%

(1) Includes Carmichael Recreation and Park District, Elk Grove Cosumnes Cemetery District, Mission Oaks Recreation and Park District, Sacramento Employment and Training Agency (S.E.T.A.), and Sunrise Recreation and Park District.

(2) Includes Orangevale Recreation and Park District only.

(3) Includes all the employers referenced in footnotes (1) and (2).

(4) Includes Fair Oaks Cemetery District and Galt-Arno Cemetery District.

EXHIBIT VI – NORMAL COST RATES WITH ADDITIONAL MEMBER CONTRIBUTIONS UNDER COST SHARING ARRANGEMENTS

The Normal Cost rates adjusted for the additional member contributions are developed in the following steps:

- Step A: Calculate the Normal Cost rates for the employer and the member assuming that no members contribute an additional portion of the Normal Cost.
- Step B: Calculate the Normal Cost rates for the employer and the member assuming that members pay exactly one-half of the total Normal Cost rate. In this step, we have adjusted the employer rate to account for the cost associated with the cessation of member contributions for Miscellaneous members hired on or before March 7, 1973 and after 30 years of service and for Safety Tier 1, Tier 2 and Tier 3 members after 30 years of service
- Step C: Gross up the member Normal Cost rates developed in Step B for the integration with Social Security

These steps are outlined in the following pages.

EXHIBIT VI – NORMAL COST RATES WITH ADDITIONAL MEMBER CONTRIBUTIONS UNDER COST SHARING ARRANGEMENTS (CONTINUED)

Step A: Normal Cost (Prior to any Additional Normal Cost Contributions by the Member)

Total Normal Cost Contribution Rates (Employer and Member Normal Cost Rates):

Miscellaneous				
	Member Paying Full Rate (% of Payroll)			
	Tier 1[(1)]	Tier 2	Tier 3	Tier 4
Employer	13.50%	11.44%	15.54%	12.11%
Member	5.98%	3.87%	5.51%	8.36%
Member COLA Buydown	0.65%	0.00%	0.27%	0.27%
Total	**20.13%**	**15.31%**	**21.32%**	**20.74%**

Safety			
	Member Paying Full Rate (% of Payroll)		
	Tier 1[(1)]	Tier 2	Tier 3
Employer	26.48%	23.55%	22.81%
Member	19.84%	14.79%	14.35%
Member COLA Buydown	1.95%	0.28%	0.28%
Total	**48.27%**	**38.62%**	**37.44%**

Note: Member rates shown are for annual salary in excess of $4,200 (or monthly salary of $350). For annual salary less than $4,200 (or monthly salary of $350), the rates are equal to 2/3 of the rates shown. Also, the member COLA buydown is a non-cash contribution item.

(1) These are the single entry age rates at age 35 and 29 for Miscellaneous and Safety, respectively.

EXHIBIT VI – NORMAL COST RATES WITH ADDITIONAL MEMBER CONTRIBUTIONS UNDER COST SHARING ARRANGEMENTS (CONTINUED)

Step B: Normal Cost (Assuming Exactly 50:50 Payment by the Employer and the Member) – Before Gross-up for the Integration with Social Security

Total Normal Cost Contribution Rates (Employer and Member Normal Cost Rates):

Miscellaneous				
	Member Paying Full Rate (% of Payroll)			
	Tier 1	Tier 2	Tier 3	Tier 4
Employer	10.52%(1)	7.66%	10.69%	10.40%
Member(4)	9.42%	7.66%	10.42%	10.13%
Member COLA Buydown	0.65%	0.00%	0.27%	0.27%
Total	**20.59%**	**15.32%**	**21.38%**	**20.80%**

Safety			
	Member Paying Full Rate (% of Payroll)		
	Tier 1	Tier 2	Tier 3
Employer	27.40%(2)	19.37%(3)	18.73%
Member(4)	22.19%	19.03%	18.45%
Member COLA Buydown	1.95%	0.28%	0.28%
Total	**51.54%**	**38.68%**	**37.46%**

Note: Member rates shown are for annual salary in excess of $4,200 (or monthly salary of $350). For annual salary less than $4,200 (or monthly salary of $350), the rates are equal to 2/3 of the rates shown. Also, the member COLA buydown is a non-cash contribution item.

(1) The employer rate has been adjusted by 0.45% of payroll to account for the cost associated with the cessation of member contributions for those members hired on or before March 7, 1973 and after 30 years of service.

(2) The employer rate has been adjusted by 3.26% of payroll to account for the cost associated with the cessation of member contributions after 30 years of service.

(3) The employer rate has been adjusted by 0.06% of payroll to account for the cost associated with the cessation of member contributions after 30 years of service.

(4) The member rates have not been grossed up for the rate on the first $4,200 in annual salary being less (by one-third) when compared to the 50:50 total Normal Cost rate. Please see the following page for the rates after the gross-up.

EXHIBIT VI – NORMAL COST RATES WITH ADDITIONAL MEMBER CONTRIBUTIONS UNDER COST SHARING ARRANGEMENTS (CONTINUED)

Step C: Normal Cost (Assuming Exactly 50:50 Payment by the Employer and the Member) – After Gross-up for the Integration with Social Security

Total Normal Cost Contribution Rates (Employer and Member Normal Cost Rates):

Miscellaneous				
	Member Paying Full Rate (% of Payroll)			
	Tier 1	Tier 2	Tier 3	Tier 4
Employer	10.52%(1)	7.66%	10.69%	10.40%
Member(4)	9.58%	7.80%	10.60%	10.29%
Member COLA Buydown	0.65%	0.00%	0.27%	0.27%
Total	**20.75%**	**15.46%**	**21.56%**	**20.96%**

Safety			
	Member Paying Full Rate (% of Payroll)		
	Tier 1	Tier 2	Tier 3
Employer	27.40%(2)	19.37%(3)	18.73%
Member(4)	22.40%	19.24%	18.68%
Member COLA Buydown	1.95%	0.28%	0.28%
Total	**51.75%**	**38.89%**	**37.69%**

Note: Member rates shown are for annual salary in excess of $4,200 (or monthly salary of $350). For annual salary less than $4,200 (or monthly salary of $350), the rates are equal to 2/3 of the rates shown. Also, the member COLA buydown is a non-cash contribution item.

(1) The employer rate has been adjusted by 0.45% of payroll to account for the cost associated with the cessation of member contributions for those members hired on or before March 7, 1973 and after 30 years of service.

(2) The employer rate has been adjusted by 3.26% of payroll to account for the cost associated with the cessation of member contributions after 30 years of service.

(3) The employer rate has been adjusted by 0.06% of payroll to account for the cost associated with the cessation of member contributions after 30 years of service.

(4) The member rates have been grossed up for the rate on the first $4,200 in annual salary being less (by one-third) when compared to the 50:50 total Normal Cost rate.

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