

# **Fresno County Employees' Retirement Association**

**Actuarial Valuation and Review as of  
June 30, 2019**



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180 Howard Street Suite 1100 San Francisco, CA 94105-6147  
T 415.263.8200 www.segalco.com

December 6, 2019

Board of Retirement  
Fresno County Employees' Retirement Association  
7772 N Palm Ave  
Fresno, CA 93711

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 July 1, 2020 to June 30, 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 Association. The census information and financial information on which our calculations were based was prepared by the staff of the Association. That assistance is gratefully acknowledged.

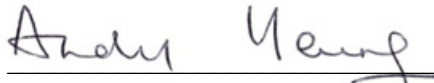
The actuarial calculations were directed under the supervision of Andy Yeung, ASA, MAAA, FCA and Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our 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 Association.


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

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# Section 1: Actuarial Valuation Summary

## Purpose and Basis

This report was prepared by Segal Consulting (“Segal”) to present a valuation of the Fresno County Employees’ Retirement Association (“FCERA” or “the Association”) 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;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of June 30, 2019, provided by FCERA;
- The assets of the Plan as of June 30, 2019, provided by FCERA;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the June 30, 2019 valuation;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. adopted by the Board for the June 30, 2019 valuation; and
- The funding policy adopted by the Board.

One of the general goals of an actuarial valuation is to establish contributions which fully fund the Association’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 Association's liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by the Association'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 Association'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 originally approved by the Board in 2015 and reaffirmed by the Board in 2017. Details of the funding policy are provided in *Section 4, Exhibit I* on page 89.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit H* beginning on page 69. A graphical projection of the Unfunded Actuarial Accrued Liability (UAAL) amortization balances and payments has been included in *Section 3, Exhibit I* on pages 74 and 75.

The Actuarial Standards Board Actuarial Standard of Practice (ASOP) No. 4 provides guidelines for actuaries to follow when measuring pension obligations. For a plan such as that offered by the Retirement Association that may utilize excess earnings to provide contribution rate offsets and additional settlement and non-statutory benefits, we are required to indicate in the valuation report that the possible impact of any such application of future excess earnings on the future financial condition of the plan has not been explicitly measured in the valuation. In particular, the balance of \$1,244 million (negative) in the Contra Tracking Account has to be fully restored before any excess earnings can be utilized in the future to provide any of the above offsets and benefits under the Board's interest crediting policy.

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: Pgs. 69 - 73    1. As we pointed out in our June 30, 2018 valuation report and discussed during our presentation of that report with Board, the combined “actuarial loss and Pension Obligation Bond Proceeds” credit amortization layer established as of the June 30, 2004 valuation has been fully amortized as of June 30, 2019. This resulted in an increase in the UAAL contribution rate of about 4% of payroll for the plan in total in the June 30, 2019 valuation. However, starting with the June 30, 2020 valuation, the Association will experience several years of contribution rate reductions as the “Actuarial Loss” layers established in the June 30, 2005 through June 30, 2011 valuations become fully amortized. For instance, there will be a decrease in the UAAL contribution rate in the June 30, 2020 valuation in excess of 6% of payroll as a result of the June 30, 2005 actuarial loss layer being fully amortized as of that valuation.
- Ref: Pg. 80    2. The results of this valuation reflect changes in the actuarial assumptions as recommended by Segal and adopted by the Board for the June 30, 2019 valuation. These changes were documented in our Actuarial Experience Study and are also outlined in *Section 4, Exhibit I* of this report. These assumption changes (including a change to the public sector generational benefit-weighted mortality tables and a reduction in the annual inflation assumption from 3.00% to 2.75%) resulted in a decrease in the average employer rate of 0.65% of payroll and an increase in the average member rate of 0.02% of payroll. Of the 0.65% decrease in the employer rate, 0.14% is due to an increase in the Normal Cost and 0.79% is due to a decrease in the UAAL rate.
- Ref: Pg. 37  
Ref: Pg. 27    3. The ratio of the Valuation Value of Assets to Actuarial Accrued Liabilities increased slightly from 81.5% to 81.7%. The ratio of the Market Value of Assets to the Actuarial Accrued Liability increased from 79.7% to 81.1%. The Association’s UAAL (which is based on the Valuation Value of Assets) has increased from \$1,091.0 million to \$1,115.4 million. The increase in UAAL is primarily due to investment return (after “smoothing”) less than the 7.00% return assumption. A complete reconciliation of the Association’s UAAL is provided in *Section 2, Subsection E*.
- Ref: Pg. 29    4. The average employer contribution rate calculated in this valuation increased from 55.08% of payroll to 60.84% of payroll. As noted above, this increase is primarily due to the June 30, 2004 combined amortization layer becoming fully amortized and investment return (after “smoothing”) less than the 7.00% return assumption, partially offset by the effect of amortizing prior year’s UAAL over a larger than expected projected total payroll and changes in actuarial assumptions. A complete reconciliation of the Association’s average employer rate is provided in *Section 2, Subsection F*.
- Ref: Pg. 30    5. The average member rate calculated in this valuation has decreased from 9.21% of payroll to 9.18% of payroll. A complete reconciliation of the Association’s average member rate is provided in *Section 2, Subsection F*.
- Ref: Pg. 19    6. The total unrecognized net investment loss as of June 30, 2019 is about \$36.7 million as compared to an unrecognized net investment loss of \$103.1 million in the previous valuation. This deferred investment loss of \$36.7 million will be recognized

in the determination of the Actuarial Value of Assets for funding purposes in the next few years as shown in *Section 2, Subsection B*.

The net deferred losses of \$36.7 million represent about 0.7% of the Market Value of Assets. Unless offset by future investment gains or other favorable experience, the recognition of the \$36.7 million market losses is expected to have an impact on the Association's future funded ratio and contribution rate requirements. This potential impact may be illustrated as follows:

- a. If the net deferred losses in this year's valuation were recognized immediately and entirely in the Valuation Value of Assets, the funded ratio would decrease from 81.7% to 81.1%.  
For comparison purposes, if all the net deferred losses in the June 30, 2018 valuation had been recognized immediately in the June 30, 2018 valuation, the funded ratio in last year's valuation would have decreased from 81.5% to 79.7%.
- b. If the net deferred losses in this year's valuation were recognized immediately and entirely in the Valuation Value of Assets, the average employer contribution rate would increase from 60.84% to 61.54% of payroll.  
For comparison purposes, if all the net deferred losses in the June 30, 2018 valuation had been recognized immediately in the June 30, 2018 valuation, the average employer contribution rate in last year's valuation would have increased from 55.81% to 57.87% of payroll.

*Ref: Pg. 105*

7. In preparing the breakdown of the total costs of the General Tier 1 plan into the cost to provide the "Regular" and the "Settlement" benefits, we have followed the FCERA practice of allocating the cost to provide a benefit under Section 31676.12 as the cost for the "Regular" benefit and allocating the difference between this "Regular" benefit cost and the cost to provide a benefit under Section 31676.14 plus Section 31627 as the "Settlement" benefit. In particular, this means that the difference between benefits under Sections 31676.12 and 31676.14 is considered "Settlement" and so under the Settlement Agreement could be funded out of future undistributed earnings. Based on discussions with Counsel, the Agreement might not be clear as to what should be considered the "Settlement" benefit. We will require guidance from the Board if and when the Board and Counsel consider the use of any future undistributed earnings to pay the cost of the "Settlement" benefit.

8. The actuarial valuation report as of June 30, 2019 is based on financial information as of that date. Changes in the assets subsequent to that date, to the extent that they exist, 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.

*Ref: Pg. 41*

9. The Actuarial Standards Board approved a new Actuarial Standard of Practice No. 51 (ASOP 51) regarding risk assessment. ASOP 51 is effective with FCERA's June 30, 2019 actuarial valuation. ASOP 51 requires actuaries to identify and assess risks that "may reasonably be anticipated to significantly affect the plan's future financial condition". Examples of key risks listed that are particularly relevant to FCERA are asset/liability mismatch risk, investment risk, and longevity risk. The standard also requires an actuary to consider if there is any ongoing contribution risk to the plan, however it does not require the actuary to

evaluate the particular ability or willingness 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 initial assessment can be strictly a qualitative discussion about potential adverse experience and the possible effect on future results, but it may also include quantitative numerical demonstrations where informative. The actuary is also encouraged to consider a recommendation as to whether a more detailed assessment or risk report would be significantly beneficial for the intended user in order to examine particular financial risks. When making that recommendation, the actuary will take into account such factors as the plan's design, risk profile, maturity, size, funded status, asset allocation, cash flow, possible insolvency and current market conditions.

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. We are in discussion with the Association's staff regarding specific content for a more detailed analysis of the potential range of the impact of risk relative to the Association's future financial condition to be provided later in a stand-alone report. Therefore, in this valuation report, we have only included a brief discussion of key risks that may affect the Association in *Section 2, Subsection J*. The more detailed assessment of the risks tailored to specific interests or concerns of the Board will provide the Board with a better understanding of the inherent risks and is recommended. This assessment will further discuss and highlight information and risks particular to FCERA such as detailed historical experience and key events, growing plan maturity, heightened contribution sensitivity to asset and liability changes, and projected sensitivity to potential future investment returns through selected scenario or stress test projections.

## Summary of Key Valuation Results

		June 30, 2019		June 30, 2018	
		Total Rate	Estimated Annual Dollar Amount <sup>(1)</sup> (\$ in '000s)	Total Rate	Estimated Annual Dollar Amount <sup>(1)</sup> (\$ in '000s)
<b>Employer Contribution Rates:</b>	• General Tier 1	62.85%	\$113,813	56.69%	\$102,658
	• General Tier 2	59.58%	4,360	53.91%	3,945
	• General Tier 3	59.93%	19,482	53.87%	17,512
	• General Tier 4	51.85%	7,344	44.92%	6,363
	• General Tier 5	49.28%	71,444	43.05%	62,412
	• Safety Tier 1	86.75%	35,192	83.37%	33,821
	• Safety Tier 2	87.91%	3,833	83.81%	3,654
	• Safety Tier 4	73.62%	3,409	68.75%	3,183
	• Safety Tier 5	69.73%	19,629	66.02%	18,584
	All Categories Combined	60.84%	\$278,506	55.08%	\$252,132
<b>Average Member Contribution Rates:</b>	• General Tier 1	9.88%	\$17,891	9.88%	\$17,891
	• General Tier 2	6.89%	504	7.10%	520
	• General Tier 3	7.99%	2,597	8.00%	2,601
	• General Tier 4	7.23%	1,024	7.08%	1,003
	• General Tier 5	7.30%	10,583	7.17%	10,395
	• Safety Tier 1	12.53%	5,083	13.31%	5,399
	• Safety Tier 2	11.40%	497	11.64%	508
	• Safety Tier 4	10.22%	473	10.08%	467
	• Safety Tier 5	11.96%	3,367	11.92%	3,355
	All Categories Combined	9.18%	\$42,019	9.21%	\$42,139

<sup>(1)</sup> Based on June 30, 2019 projected annual compensation of \$457,759,000.

## Summary of Key Valuation Results (continued)

		June 30, 2019 (\$ in '000s)	June 30, 2018 (\$ in '000s)
<b>Actuarial Accrued Liability as of June 30:</b>	<ul style="list-style-type: none"> <li>Retired members and beneficiaries</li> <li>Inactive vested members<sup>(1)</sup></li> <li>Active members</li> <li>Total Actuarial Accrued Liability</li> <li>Normal Cost for plan year beginning June 30<sup>(2)</sup></li> </ul>	\$3,792,308 324,628 1,969,718 6,086,654 116,087	\$3,677,223 315,035 1,901,651 5,893,909 113,193
<b>Assets as of June 30:</b>	<ul style="list-style-type: none"> <li>Market Value of Assets (MVA)<sup>(3)</sup></li> <li>Valuation Value of Assets (VVA)<sup>(3)</sup></li> </ul>	\$4,934,507 4,971,225	\$4,699,871 4,802,958
<b>Funded status as of June 30:</b>	<ul style="list-style-type: none"> <li>Unfunded Actuarial Accrued Liability on Market Value of Assets basis</li> <li>Funded percentage on MVA basis</li> <li>Unfunded Actuarial Accrued Liability on Valuation Value of Assets basis</li> <li>Funded percentage on VVA basis</li> </ul>	\$1,152,147 81.07% \$1,115,429 81.67%	\$1,194,038 79.74% \$1,090,951 81.49%
<b>Key assumptions:</b>	<ul style="list-style-type: none"> <li>Net investment return</li> <li>Price inflation</li> <li>Payroll growth</li> </ul>	7.00% 2.75% 3.25%	7.00% 3.00% 3.50%

<sup>(1)</sup> Includes inactive members with member contributions on deposit with less than five years of service.

<sup>(2)</sup> Includes administrative expense load.

<sup>(3)</sup> Excludes non-valuation reserves (contingency reserve, if any).

## Summary of Key Valuation Results (continued)

		June 30, 2019	June 30, 2018	Change From Prior Year
Demographic data as of June 30:	<b>Active Members:</b>			
	• Number of members	7,676	7,458	2.9%
	• Average age	42.3	42.6	-0.3
	• Average service	10.0	10.2	-0.2
	• Total projected compensation	\$457,758,858	\$431,678,317	6.0%
	• Average projected compensation	\$59,635	\$57,881	3.0%
	<b>Retired Members and Beneficiaries:</b>			
	• Number of members:			
	– Service retired	6,219	6,074	2.4%
	– Disability retired	417	401	4.0%
	– Beneficiaries	1,015	970	4.6%
	– Total	7,651	7,445	2.8%
	• Average age	69.8	69.6	0.2
	• Average monthly benefit <sup>(1)</sup>	\$3,112	\$3,023	2.9%
	<b>Inactive Vested Members:</b>			
	• Number of members	3,873	3,627	6.8%
	• Average Age	44.5	44.9	-0.4
	<b>Total Members:</b>	19,200	18,530	3.6%

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## 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:

<b>Plan of benefits</b>	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.
<b>Participant data</b>	An actuarial valuation for a plan is based on data provided to the actuary by the Association. 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.
<b>Assets</b>	The valuation is based on the Market Value of Assets as of the valuation date, as provided by the Association. The Association uses a “Valuation Value of Assets” that differs from market value to gradually reflect six-month changes in the Market Value of Assets in determining the contribution requirements.
<b>Actuarial assumptions</b>	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, termination, 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 Association. 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 Association 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 Association 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.

## Section 2: Actuarial Valuation Results

### 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 <sup>(1)</sup>	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2010	6,946	1,452	5,636	7,088	1.02	0.81
2011	6,763	1,414	5,887	7,301	1.08	0.87
2012	6,677	1,375	6,235	7,610	1.14	0.93
2013	6,866	1,295	6,363	7,658	1.12	0.93
2014	6,968	1,380	6,570	7,950	1.14	0.94
2015	7,001	3,163	6,839	10,002	1.43	0.98
2016	7,297	3,289	7,032	10,321	1.41	0.96
2017	7,353	3,411	7,200	10,611	1.44	0.98
2018	7,458	3,627	7,445	11,072	1.48	1.00
2019	7,676	3,873	7,651	11,524	1.50	1.00

<sup>(1)</sup> Effective June 30, 2015, includes inactive members under age 70 and less than five years of service with member contributions on deposit.

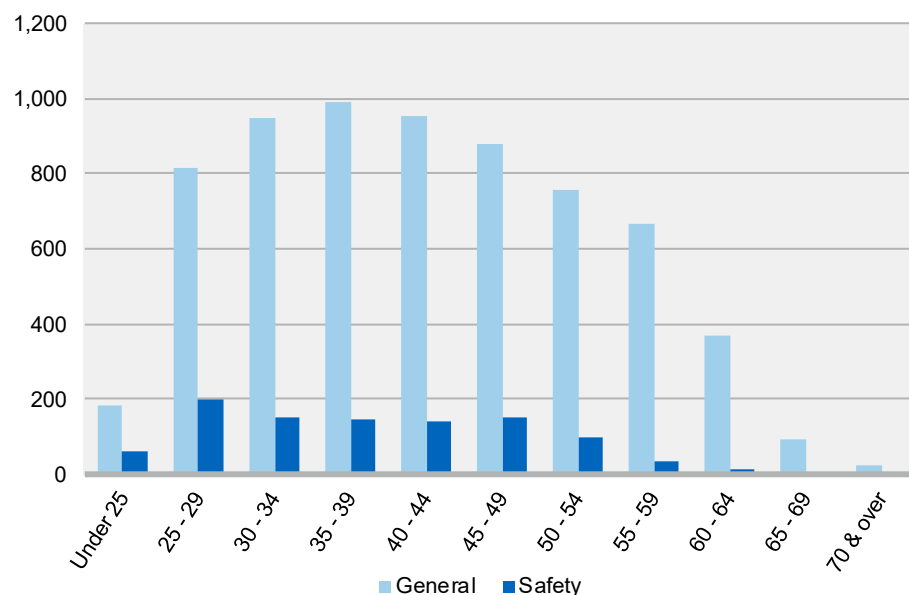
## Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 7,676 active members with an average age of 42.3, average years of service of 10.0 years and average compensation of \$59,635. The 7,458 active members in the prior valuation had an average age of 42.6, average service of 10.2 years and average compensation of \$57,881.

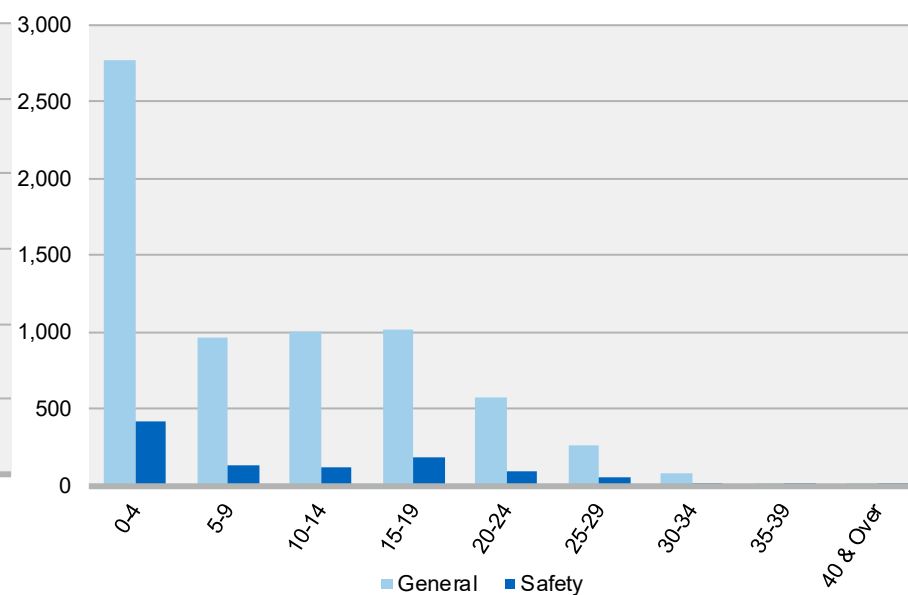
Among the active members, there were none with unknown age information.

### 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 3,873 members with a vested right to a deferred or immediate vested benefit or entitled to a return of their member contributions versus 3,627 in the prior valuation.

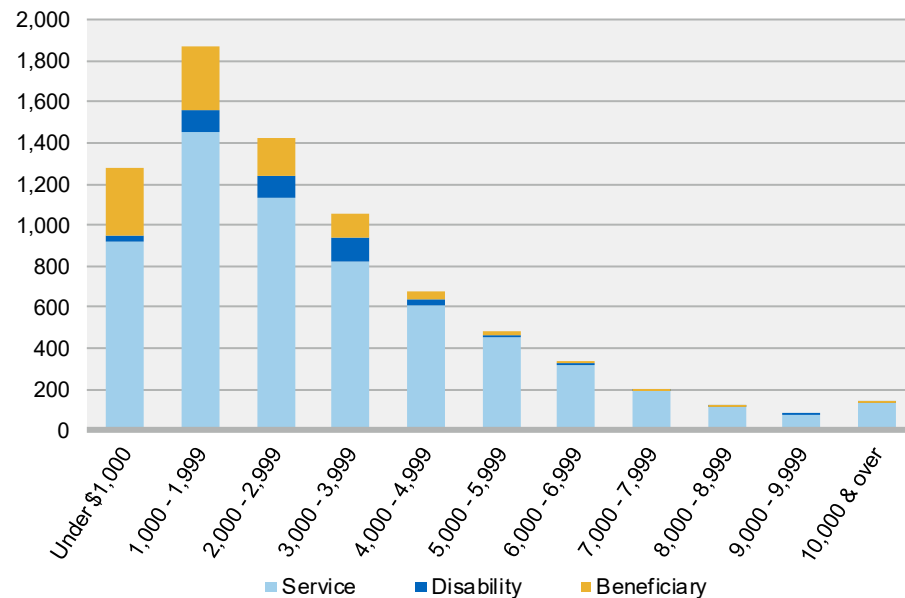
## Retired Members and Beneficiaries

As of June 30, 2019, 6,636 retired members and 1,015 beneficiaries were receiving total monthly benefits of \$23,809,540. For comparison, in the previous valuation, there were 6,475 retired members and 970 beneficiaries receiving monthly benefits of \$22,506,432.

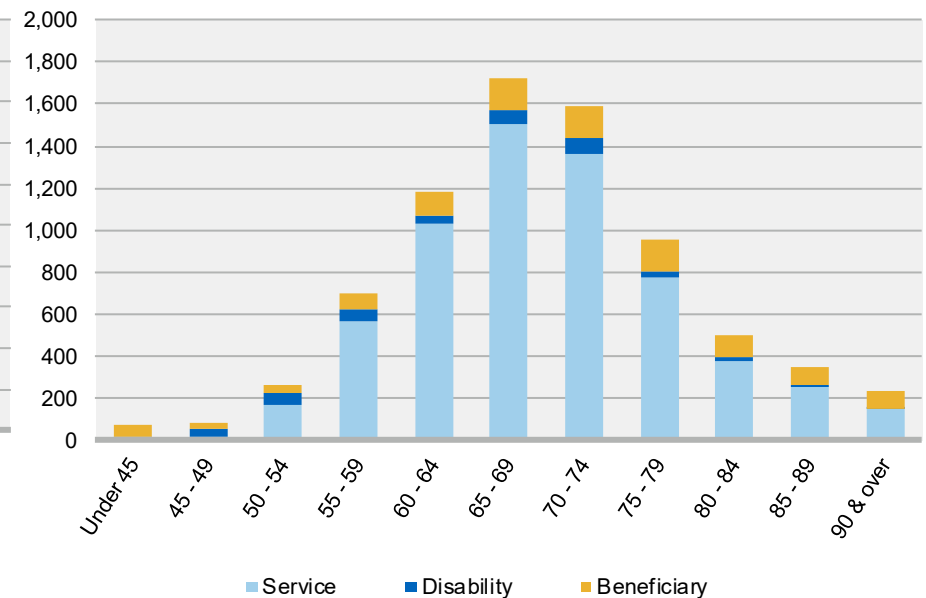
As of June 30, 2019, the average monthly benefit for retired members and beneficiaries is \$3,112, compared to \$3,023 in the previous valuation. The average age for retired members and beneficiaries is 69.8 in the current valuation, compared with 69.6 in the prior valuation.

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

RETIRED MEMBERS AND BENEFICIARIES BY  
TYPE AND MONTHLY AMOUNT



RETIRED MEMBERS AND BENEFICIARIES BY  
TYPE AND AGE



## 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

Year Ended June 30	Active Participants			Retired Members and Beneficiaries		
	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2010	6,946	44.4	11.2	5,636	68.3	\$2,493
2011	6,763	44.7	11.6	5,887	68.4	2,525
2012	6,677	44.3	11.4	6,235	68.3	2,634
2013	6,866	44.0	11.2	6,363	68.6	2,695
2014	6,968	43.6	11.0	6,570	68.8	2,767
2015	7,001	43.5	10.9	6,839	68.9	2,823
2016	7,297	43.2	10.5	7,032	69.2	2,855
2017	7,353	43.0	10.4	7,200	69.4	2,919
2018	7,458	42.6	10.2	7,445	69.6	3,023
2019	7,676	42.3	10.0	7,651	69.8	3,112

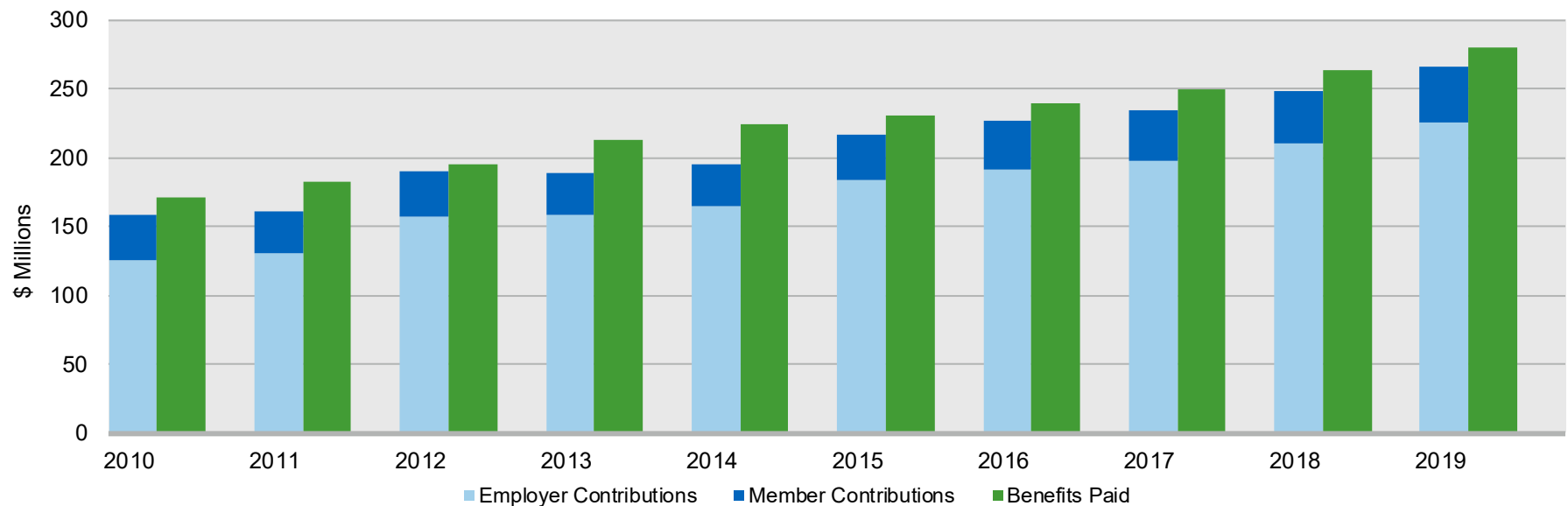
## B. Financial Information

Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and investment earnings (less investment fees) 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  
FOR YEARS ENDED JUNE 30, 2010 – 2019**



## DETERMINATION OF ACTUARIAL VALUE OF ASSETS

<b>1</b>	<b>Market Value of Assets</b>					<b>\$4,934,507,078</b>
<b>2</b>	<b>Calculation of unrecognized return<sup>(1)</sup></b>	<b>Actual Return</b>	<b>Expected Return</b>	<b>Investment Gain / (Loss)</b>	<b>Percent Deferred</b>	<b>Unrecognized Amount</b>
a)	Six months ended December 31, 2014	\$(49,012,922)	\$146,717,748	\$(195,730,670)	0%	\$0
b)	Six months ended June 30, 2015	45,076,629	144,685,951	(99,609,322)	10	(9,960,932)
c)	Six months ended December 31, 2015	(150,074,689)	146,021,073	(296,095,762)	20	(59,219,152)
d)	Six months ended June 30, 2016	145,755,632	140,249,099	5,506,533	30	1,651,960
e)	Six months ended December 31, 2016	92,367,225	145,213,925	(52,846,700)	40	(21,138,680)
f)	Six months ended June 30, 2017	325,236,505	148,201,950	177,034,556	50	88,517,278
g)	Six months ended December 31, 2017	255,148,692	154,139,232	101,009,461	60	60,605,676
h)	Six months ended June 30, 2018	57,407,321	162,721,074	(105,313,754)	70	(73,719,628)
i)	Six months ended December 31, 2018	(200,741,127)	164,348,431	(365,089,559)	80	(292,071,647)
j)	Six months ended June 30, 2019	455,434,785	156,971,477	298,463,307	90	<u>268,616,977</u>
k)	Total unrecognized return <sup>(2)</sup>					<u>\$(36,718,148)</u>
<b>3</b>	<b>Actuarial Value of Assets 1 – 2k</b>					<b><u>\$4,971,225,226</u></b>
<b>4</b>	<b>Actuarial Value of Assets as a percentage of Market Value of Assets 3 / 1</b>					<b>100.7%</b>
<b>5</b>	<b>Actuarial Value of Assets Corridor Limits:</b>					
a)	Lower Limit - 70% of Market Value of Assets					\$3,454,154,955
b)	Upper Limit - 130% of Market Value of Assets					\$6,414,859,202
<b>6</b>	<b>Non-valuation reserves:</b>					
a)	Reserve for Interest Fluctuations (Contingency Reserve), Limited to No Less Than \$0					\$0
b)	Board Contingency Reserve/Undistributed Earnings ("Available Earnings")					0
c)	Supplemental COLA					0
d)	Retiree Health Benefit (BOR)					0
e)	Subtotal					\$0
<b>7</b>	<b>Valuation Value of Assets 3 – 6e</b>					<b><u>\$4,971,225,226</u></b>

Note: Results may be slightly off due to rounding.

<sup>(1)</sup> The expected market return has been calculated by FCERA using an investment return assumption consistent with that used in the applicable actuarial valuation to set the employer and employee contribution rates for that period.

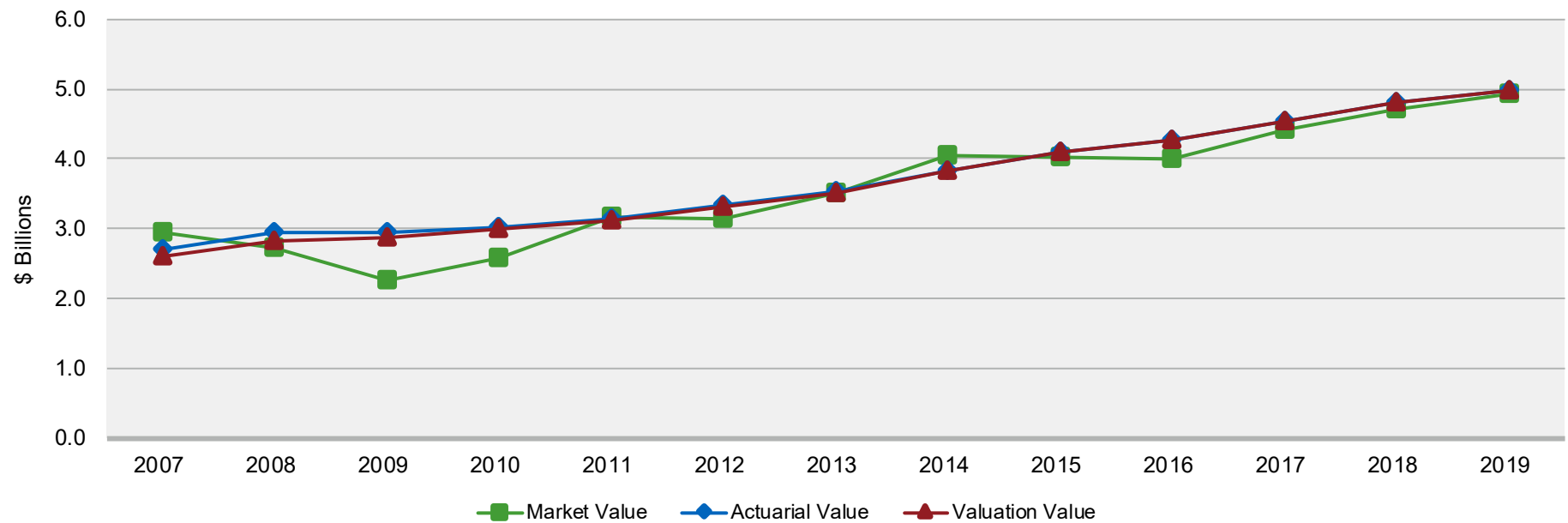
<sup>(2)</sup> Deferred return as of June 30, 2019 recognized in each of the next five years:

(a) Amount recognized on June 30, 2020	\$(57,427,316)	(d) Amount recognized on June 30, 2023	(23,856,626)
(b) Amount recognized on June 30, 2021	11,202,116	(e) Amount recognized on June 30, 2024	<u>29,846,331</u>
(c) Amount recognized on June 30, 2022	3,517,347	(f) Subtotal	<u>\$(36,718,148)</u>

### Section 2: Actuarial Valuation Results (as of June 30, 2019 for the Fresno County Employees' Retirement Association)

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. This valuation reflects changes in actuarial assumptions adopted by the Board of Retirement.

The net total loss is \$178.7 million, which includes \$147.2 million from investment losses, a net loss of \$15.7 million from contribution experience and \$15.8 million in losses from all other sources. The net experience variation from individual sources other than investments and contributions was 0.3% 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

<b>1</b>	Net loss from investments <sup>(1)</sup>	\$(147,180,000)
<b>2</b>	Net loss from contribution experience	(15,681,000)
<b>3</b>	Net loss from other experience <sup>(2)</sup>	<u>(15,820,000)</u>
<b>4</b>	Net experience loss: <b>1 + 2 + 3</b>	\$(178,681,000)

<sup>(1)</sup> Details on next page.

<sup>(2)</sup> 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 5.43% for the year ended June 30, 2019.

For valuation purposes, the assumed rate of return on the Valuation Value of Assets is 7.00% (based on the June 30, 2018 actuarial valuation). The actual rate of return on a valuation basis for the 2019 plan year was 3.93%. 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
<b>1</b> Net investment income	\$254,693,657	\$188,324,865	\$188,324,865
<b>2</b> Average value of assets	4,689,842,414	4,792,929,354	4,792,929,354
<b>3</b> Rate of return: <b>1 ÷ 2</b>	5.43%	3.93%	3.93%
<b>4</b> Assumed rate of return	7.00%	7.00%	7.00%
<b>5</b> Expected investment income: <b>2 x 4</b>	<u>328,288,969</u>	<u>335,505,055</u>	<u>335,505,055</u>
<b>6</b> Actuarial gain/(loss): <b>1 – 5</b>	<u>\$(73,595,312)</u>	<u>\$(147,180,190)</u>	<u>\$(147,180,190)</u>

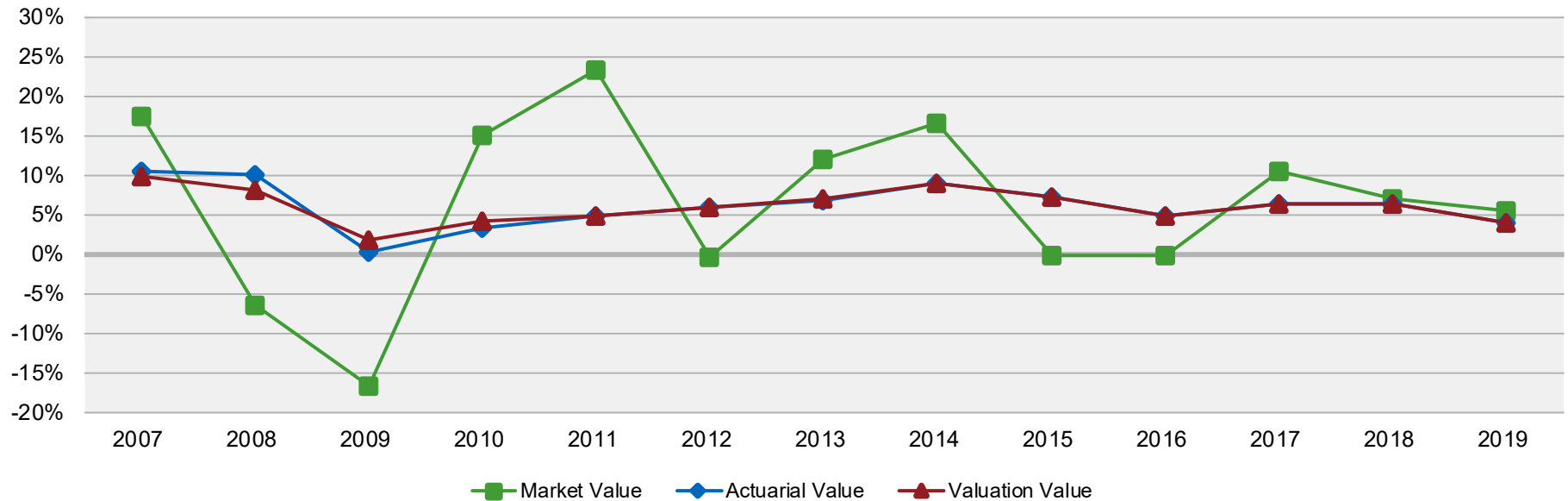
Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial and valuation basis compared to the actual market value investment return for the last ten years, including 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	\$337,869,234	14.98%	\$100,789,315	3.44%	\$123,408,438	4.31%
2011	601,313,325	23.34%	144,184,272	4.78%	144,184,273	4.84%
2012	(13,839,384)	(0.44%)	187,138,723	5.94%	187,137,138	6.01%
2013	374,807,596	11.95%	229,380,360	6.91%	229,380,360	6.96%
2014	579,606,657	16.63%	318,423,932	9.03%	315,164,400	8.98%
2015	(3,936,293)	(0.10%)	278,588,357	7.29%	279,206,627	7.31%
2016	(4,319,056)	(0.11%)	203,088,149	4.97%	203,089,850	4.97%
2017	417,603,730	10.44%	271,225,694	6.35%	271,333,784	6.36%
2018	312,556,012	7.11%	293,356,239	6.49%	293,356,239	6.49%
2019	254,693,657	5.43%	188,324,865	3.93%	188,324,865	3.93%
<b>Most recent five-year geometric average return</b>		<b>4.47%</b>	<b>5.80%</b>		<b>5.81%</b>	
<b>Most recent ten-year geometric average return</b>		<b>8.66%</b>	<b>5.90%</b>		<b>6.01%</b>	

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 ENDING JUNE 30, 2007 – 2019



## Contributions

Contributions for the year ended June 30, 2019 totaled \$266.0 million, compared to the projected amount of \$281.1 million. This resulted in a net loss of \$15.7 million from contribution experience for the year, when adjusted for timing.

## 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 \$15.8 million, which is 0.3% 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 \$6.1 billion, an increase of \$0.2 billion, or 3.3%, 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

- The assumption changes reflected in this report were based on the July 1, 2015 through June 30, 2018 Actuarial Experience Study report dated April 9, 2019.
  - These changes (including a change to the public sector generational benefit-weighted mortality tables and a reduction in the annual inflation assumption from 3.00% to 2.75%) decreased the Actuarial Accrued Liability by about \$61 million and increased the total (employer and member) Normal Cost by 0.16% of payroll. The total (Normal Cost and UAAL) contribution rate decrease for the employer and the member as a result of the assumption changes was 0.63% of payroll.
  - The assumption changes include changes to inflation, merit and promotional salary increases, retirement from active employment, retirement age for deferred vested members, percent of members assumed to go on to work for a reciprocal system, reciprocal salary increases, percentage of members with an eligible spouse or domestic partner, pre-retirement mortality, healthy life post-retirement mortality, disabled life post-retirement mortality, termination (refund and deferred vested retirement), disability (service and non-service connected), and annual leave conversion.
- 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 (\$ IN '000s)

<b>1</b>	<b>Unfunded Actuarial Accrued Liability at beginning of year</b>	<b>\$1,090,951</b>
<b>2</b>	Total Normal Cost at middle of year <sup>(1)</sup>	111,809
<b>3</b>	Expected administrative expenses	4,752
<b>4</b>	Expected employer and member contributions	(281,114)
<b>5</b>	Interest	<u>71,215</u>
<b>6</b>	Expected Unfunded Actuarial Accrued Liability at end of year	\$997,613
<b>7</b>	Changes due to:	
	a) Investment return less than expected (after "smoothing")	\$147,180
	b) Actual contributions less than expected <sup>(2)</sup>	15,681
	c) Individual salary increases less than expected	(5,094)
	d) Additional 0.5% COLA Banked in Excess of the Maximum 3% COLA Granted on April 1, 2019 <sup>(3)</sup>	16,426
	e) Other experience loss	4,488
	f) Changes in actuarial assumptions	<u>(60,865)</u>
	Total changes	<u>\$117,816</u>
<b>8</b>	<b>Unfunded Actuarial Accrued Liability at end of year</b>	<b><u>\$1,115,429</u></b>

Note: The sum of items 6c, 6d and 6e equals the "Net loss from other experience" shown in Subsection C.

<sup>(1)</sup> Excludes administrative expense load.

<sup>(2)</sup> Includes contribution loss from one-year delay in implementing higher contribution rates recommended in June 30, 2018 valuation.

<sup>(3)</sup> Under the new 2.75% inflation assumption adopted in the June 30, 2019 valuation, COLAs are valued at 3.00% until the member's COLA bank is exhausted.

## 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 60.84% 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	June 30, 2019		June 30, 2018	
	Amount (\$ in '000s)	% of Projected Compensation	Amount (\$ in '000s)	% of Projected Compensation
<b>1</b> Total Normal Cost <sup>(1)</sup>	\$116,087	25.36%	\$113,193	26.22%
<b>2</b> Expected member contributions	<u>42,019</u>	<u>9.18%</u>	<u>40,192</u>	<u>9.31%</u>
<b>3</b> Employer Normal Cost: <b>1 – 2</b>	\$74,068	16.18%	\$73,001	16.91%
<b>4</b> Actuarial Accrued Liability	6,086,654		5,893,909	
<b>5</b> Valuation Value of Assets	<u>4,971,225</u>		<u>4,802,958</u>	
<b>6</b> Unfunded Actuarial Accrued Liability: <b>4 – 5</b>	\$1,115,429		\$1,090,951	
<b>7</b> Payment on Unfunded Actuarial Accrued Liability	\$204,438	44.66%	\$167,921	38.90%
<b>8</b> Total average recommended employer contribution: <b>3 + 7</b>	<u>\$278,506</u>	<u>60.84%</u>	<u>\$240,922</u>	<u>55.81%</u>
<b>9</b> Projected compensation	\$457,759		\$431,678	

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

<sup>(1)</sup> Includes administrative expense load.

## 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 <sup>(1)</sup> (\$ in '000s)
<b>Average Recommended Employer Contribution as of June 30, 2018</b>	<b>55.08%</b>	<b>\$252,132</b>
• Effect of the June 30, 2004 amortization credit being fully amortized <sup>(2)</sup>	4.17%	\$19,089
• Effect of investment return less than expected (after "smoothing")	2.78%	12,726
• Effect of actual contributions less than expected <sup>(3)</sup>	0.30%	1,373
• Effect of individual salary increases less than expected	(0.10%)	(458)
• Effect of amortizing prior year's UAAL over a larger than expected projected total payroll	(1.01%)	(4,623)
• Effect of additional 0.5% COLA Banked in Excess of the Maximum 3% COLA Granted on April 1, 2019 <sup>(4)</sup>	0.31%	1,419
• Effect of other experience gains	(0.04%)	(177)
• Effect of changes in actuarial assumptions	<u>(0.65%)</u>	<u>(2,975)</u>
Total change	5.76%	\$26,374
<b>Average Recommended Employer Contribution as of June 30, 2019</b>	<b>60.84%</b>	<b>\$278,506</b>

<sup>(1)</sup> Based on June 30, 2019 projected annual compensation of \$457,759,000.

<sup>(2)</sup> The combined "actuarial loss and Pension Obligation Bond Proceeds" credit amortization layer established as of June 30, 2004 has been fully paid off as of the June 30, 2019 valuation.

<sup>(3)</sup> Includes contribution loss from one-year delay in implementing higher contribution rates recommended in June 30, 2018 valuation.

<sup>(4)</sup> Under the new 2.75% inflation assumption adopted in the June 30, 2019 valuation, COLAs are valued at 3.00% until the member's COLA bank is exhausted.

## Reconciliation of Average Recommended Member Contribution Rate

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 RATE FROM JUNE 30, 2018 TO JUNE 30, 2019

	Contribution Rate	Estimated Annual Dollar Amount <sup>(1)</sup> (\$ in '000s)
<b>Average Recommended Member Contribution as of June 30, 2018</b>	<b>9.21%</b>	<b>\$42,139</b>
• Effect of changes in member demographic amongst tiers	(0.05%)	\$(212)
• Effect of changes in actuarial assumptions	<u>0.02%</u>	<u>92</u>
Total change	(0.03%)	\$(120)
<b>Average Recommended Member Contribution as of June 30, 2019</b>	<b>9.18%</b>	<b>\$42,019</b>

<sup>(1)</sup> Based on June 30, 2019 projected annual compensation of \$457,759,000.

## Recommended Employer Contribution Rates

	June 30, 2019 Actuarial Valuation <sup>(1)</sup> Recommended Rates for FY 2020-21				June 30, 2018 Actuarial Valuation <sup>(2)</sup> Recommended Rates for FY 2019-20			
	Basic	COLA	Total	Estimated Annual Dollar Amount <sup>(3)</sup> (\$ in '000s)	Basic	COLA	Total	Estimated Annual Dollar Amount <sup>(3)</sup> (\$ in '000s)
<b>General Tier 1 Members</b>								
Normal Cost	15.68%	5.19%	20.87%	\$37,793	15.85%	4.96%	20.81%	\$37,684
UAAL	<u>33.99%</u>	<u>7.99%</u>	<u>41.98%</u>	<u>76,020</u>	<u>30.72%</u>	<u>5.16%</u>	<u>35.88%</u>	<u>64,974</u>
Total Contributions	49.67%	13.18%	62.85%	\$113,813	46.57%	10.12%	56.69%	\$102,658
<b>General Tier 2 Members</b>								
Normal Cost	17.33%	0.27%	17.60%	\$1,288	17.80%	0.23%	18.03%	\$1,319
UAAL	<u>33.99%</u>	<u>7.99%</u>	<u>41.98%</u>	<u>3,072</u>	<u>30.72%</u>	<u>5.16%</u>	<u>35.88%</u>	<u>2,626</u>
Total Contributions	51.32%	8.26%	59.58%	\$4,360	48.52%	5.39%	53.91%	\$3,945
<b>General Tier 3 Members</b>								
Normal Cost	17.62%	0.33%	17.95%	\$5,835	17.67%	0.32%	17.99%	\$5,848
UAAL	<u>33.99%</u>	<u>7.99%</u>	<u>41.98%</u>	<u>13,647</u>	<u>30.72%</u>	<u>5.16%</u>	<u>35.88%</u>	<u>11,664</u>
Total Contributions	51.61%	8.32%	59.93%	\$19,482	48.39%	5.48%	53.87%	\$17,512
<b>General Tier 4 Members</b>								
Normal Cost	9.87%	0.00%	9.87%	\$1,398	9.04%	0.00%	9.04%	\$1,281
UAAL	<u>33.99%</u>	<u>7.99%</u>	<u>41.98%</u>	<u>5,946</u>	<u>30.72%</u>	<u>5.16%</u>	<u>35.88%</u>	<u>5,082</u>
Total Contributions	43.86%	7.99%	51.85%	\$7,344	39.76%	5.16%	44.92%	\$6,363
<b>General Tier 5 Members</b>								
Normal Cost	7.30%	0.00%	7.30%	\$10,583	7.17%	0.00%	7.17%	\$10,395
UAAL	<u>33.99%</u>	<u>7.99%</u>	<u>41.98%</u>	<u>60,861</u>	<u>30.72%</u>	<u>5.16%</u>	<u>35.88%</u>	<u>52,017</u>
Total Contributions	41.29%	7.99%	49.28%	\$71,444	37.89%	5.16%	43.05%	\$62,412

<sup>(1)</sup> The June 30, 2019 Regular Normal Cost and UAAL rates shown for each cost group include an explicit administrative expense of 0.16% and 0.88% of payroll, respectively.

<sup>(2)</sup> The June 30, 2018 Regular Normal Cost and UAAL rates shown for each cost group include an explicit administrative expense of 0.16% and 0.78% of payroll, respectively.

<sup>(3)</sup> Amounts are in thousands and are based on June 30, 2019 projected annual compensation shown on the page 33.

## Recommended Employer Contribution Rates (continued)

	June 30, 2019 Actuarial Valuation <sup>(1)</sup> Recommended Rates for FY 2020-21				June 30, 2018 Actuarial Valuation <sup>(2)</sup> Recommended Rates for FY 2019-20			
	Basic	COLA	Total	Estimated Annual Dollar Amount <sup>(3)</sup> (\$ in '000s)	Basic	COLA	Total	Estimated Annual Dollar Amount <sup>(3)</sup> (\$ in '000s)
<b>Safety Tier 1 Members</b>								
Normal Cost	23.00%	5.98%	28.98%	\$11,756	23.55%	5.72%	29.27%	\$11,874
UAAL	<u>48.37%</u>	<u>9.40%</u>	<u>57.77%</u>	<u>23,436</u>	<u>47.42%</u>	<u>6.68%</u>	<u>54.10%</u>	<u>21,947</u>
Total Contributions	71.37%	15.38%	86.75%	\$35,192	70.97%	12.40%	83.37%	\$33,821
<b>Safety Tier 2 Members</b>								
Normal Cost	29.89%	0.25%	30.14%	\$1,314	29.46%	0.25%	29.71%	\$1,295
UAAL	<u>48.37%</u>	<u>9.40%</u>	<u>57.77%</u>	<u>2,519</u>	<u>47.42%</u>	<u>6.68%</u>	<u>54.10%</u>	<u>2,359</u>
Total Contributions	78.26%	9.65%	87.91%	\$3,833	76.88%	6.93%	83.81%	\$3,654
<b>Safety Tier 4 Members</b>								
Normal Cost	15.65%	0.20%	15.85%	\$734	14.45%	0.20%	14.65%	\$678
UAAL	<u>48.37%</u>	<u>9.40%</u>	<u>57.77%</u>	<u>2,675</u>	<u>47.42%</u>	<u>6.68%</u>	<u>54.10%</u>	<u>2,505</u>
Total Contributions	64.02%	9.60%	73.62%	\$3,409	61.87%	6.88%	68.75%	\$3,183
<b>Safety Tier 5 Members</b>								
Normal Cost	11.96%	0.00%	11.96%	\$3,367	11.92%	0.00%	11.92%	\$3,355
UAAL	<u>48.37%</u>	<u>9.40%</u>	<u>57.77%</u>	<u>16,262</u>	<u>47.42%</u>	<u>6.68%</u>	<u>54.10%</u>	<u>15,229</u>
Total Contributions	60.33%	9.40%	69.73%	\$19,629	59.34%	6.68%	66.02%	\$18,584
<b>All Categories Combined</b>								
Normal Cost	13.57%	2.61%	16.18%	\$74,068	13.61%	2.50%	16.11%	\$73,729
UAAL	<u>36.43%</u>	<u>8.23%</u>	<u>44.66%</u>	<u>204,438</u>	<u>33.55%</u>	<u>5.42%</u>	<u>38.97%</u>	<u>178,403</u>
Total Contributions	50.00%	10.84%	60.84%	\$278,506	47.16%	7.92%	55.08%	\$252,132

<sup>(1)</sup> The June 30, 2019 Regular Normal Cost and UAAL rates shown for each cost group include an explicit administrative expense of 0.16% and 0.88% of payroll, respectively.

<sup>(2)</sup> The June 30, 2018 Regular Normal Cost and UAAL rates shown for each cost group include an explicit administrative expense of 0.16% and 0.78% of payroll, respectively.

<sup>(3)</sup> Amounts are in thousands and are based on June 30, 2019 projected annual compensation shown on the page 33.

## Recommended Employer Contribution Rates (continued)

The projected compensation that is used to estimate the annual dollar amount shown on the prior pages are as follows:

	June 30, 2019 Projected Compensation (\$ in '000s)
General Tier 1	\$181,086
General Tier 2	7,318
General Tier 3	32,508
General Tier 4	14,165
General Tier 5	144,975
Safety Tier 1	40,567
Safety Tier 2	4,360
Safety Tier 4	4,630
Safety Tier 5	<u>28,150</u>
Total	\$457,759

## Recommended Employer Contribution Rates (continued)

### Breakdown of the Employer Contribution Rate into Basic and COLA (General)

Normal Cost	June 30, 2019					June 30, 2018				
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Regular - Basic	12.56%	14.18%	14.19%	9.71%	7.14%	12.48%	14.41%	14.12%	8.88%	7.01%
Regular - COLA	2.96%	2.99%	3.27%	0.00%	0.00%	3.21%	3.23%	3.39%	0.00%	0.00%
Section 6	4.82%	0.00%	0.00%	0.00%	0.00%	4.59%	0.00%	0.00%	0.00%	0.00%
Section 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Section 9	0.37%	0.27%	0.33%	0.00%	0.00%	0.37%	0.23%	0.32%	0.00%	0.00%
Administrative Expense	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>
Subtotal	20.87%	17.60%	17.95%	9.87%	7.30%	20.81%	18.03%	17.99%	9.04%	7.17%
<b>UAAL</b>										
Regular - Basic	22.16%	22.16%	22.16%	22.16%	22.16%	19.37%	19.37%	19.37%	19.37%	19.37%
Regular - COLA	10.95%	10.95%	10.95%	10.95%	10.95%	10.57%	10.57%	10.57%	10.57%	10.57%
Section 6	6.97%	6.97%	6.97%	6.97%	6.97%	4.16%	4.16%	4.16%	4.16%	4.16%
Section 8	-0.19%	-0.19%	-0.19%	-0.19%	-0.19%	-0.09%	-0.09%	-0.09%	-0.09%	-0.09%
Section 9	1.21%	1.21%	1.21%	1.21%	1.21%	1.09%	1.09%	1.09%	1.09%	1.09%
Administrative Expense	<u>0.88%</u>	<u>0.88%</u>	<u>0.88%</u>	<u>0.88%</u>	<u>0.88%</u>	<u>0.78%</u>	<u>0.78%</u>	<u>0.78%</u>	<u>0.78%</u>	<u>0.78%</u>
Subtotal	41.98%	41.98%	41.98%	41.98%	41.98%	35.88%	35.88%	35.88%	35.88%	35.88%
<b>Total</b>	<b>62.85%</b>	<b>59.58%</b>	<b>59.93%</b>	<b>51.85%</b>	<b>49.28%</b>	<b>56.69%</b>	<b>53.91%</b>	<b>53.87%</b>	<b>44.92%</b>	<b>43.05%</b>

Note: Please refer to *Section 4, Exhibit II* for definition of Regular and Settlement Sections 6, 8 and 9 benefits.

## Recommended Employer Contribution Rates (continued)

### Breakdown of the Employer Contribution Rate into Basic and COLA (Safety)

Normal Cost	June 30, 2019				June 30, 2018			
	Tier 1	Tier 2	Tier 4	Tier 5	Tier 1	Tier 2	Tier 4	Tier 5
Regular - Basic	18.37%	23.85%	15.49%	11.80%	18.53%	23.20%	14.29%	11.76%
Regular - COLA	4.47%	5.88%	0.00%	0.00%	4.86%	6.10%	0.00%	0.00%
Section 6	5.66%	0.00%	0.00%	0.00%	5.40%	0.00%	0.00%	0.00%
Section 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Section 9	0.32%	0.25%	0.20%	0.00%	0.32%	0.25%	0.20%	0.00%
Administrative Expense	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>	<u>0.16%</u>
Subtotal	28.98%	30.14%	15.85%	11.96%	29.27%	29.71%	14.65%	11.92%
<b>UAAL</b>								
Regular - Basic	24.60%	24.60%	24.60%	24.60%	21.17%	21.17%	21.17%	21.17%
Regular - COLA	22.89%	22.89%	22.89%	22.89%	25.47%	25.47%	25.47%	25.47%
Section 6	8.38%	8.38%	8.38%	8.38%	5.68%	5.68%	5.68%	5.68%
Section 8	-0.19%	-0.19%	-0.19%	-0.19%	-0.09%	-0.09%	-0.09%	-0.09%
Section 9	1.21%	1.21%	1.21%	1.21%	1.09%	1.09%	1.09%	1.09%
Administrative Expense	<u>0.88%</u>	<u>0.88%</u>	<u>0.88%</u>	<u>0.88%</u>	<u>0.78%</u>	<u>0.78%</u>	<u>0.78%</u>	<u>0.78%</u>
Subtotal	57.77%	57.77%	57.77%	57.77%	54.10%	54.10%	54.10%	54.10%
<b>Total</b>	<b>86.75%</b>	<b>87.91%</b>	<b>73.62%</b>	<b>69.73%</b>	<b>83.37%</b>	<b>83.81%</b>	<b>68.75%</b>	<b>66.02%</b>

Note: Please refer to *Section 4, Exhibit II* for definition of Regular and Settlement Sections 6, 8 and 9 benefits.

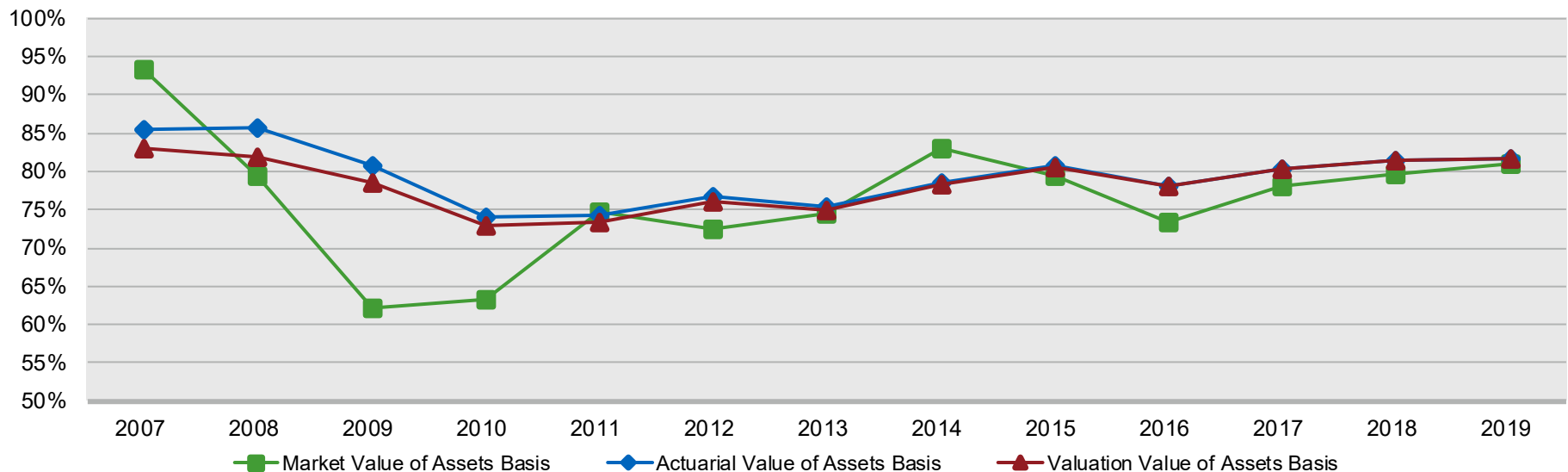
## G. Funded Status

A commonly reported piece of information regarding the Plan's financial status is the funded ratio. These ratios compare the Market, Actuarial and Valuation Value of Assets to the Actuarial Accrued Liability of the Plan. Higher ratios indicate a relatively well-funded plan while lower ratios may indicate recent changes to actuarial assumptions, funding of the plan below actuarial requirements, poor asset performance, or a variety of other causes.

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 Market, Actuarial or Valuation Value of Assets is used.

**FUNDED RATIO FOR PLAN YEARS ENDING JUNE 30, 2007 – 2019**



**SCHEDULE OF FUNDING PROGRESS  
FOR PLAN YEARS ENDING JUNE 30, 2010 - 2019**

Actuarial Valuation Date as of June 30	Valuation Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (%) (a) / (b)	Projected Covered Payroll (c)	UAAL as a Percentage of Projected Covered Payroll (%) [(b) - (a)] / (c)
2010	\$2,983,044,000	\$4,092,464,000	\$1,109,420,000	72.89%	\$408,861,000	271.34%
2011	3,114,483,000	4,237,961,000	1,123,478,000	73.49%	398,976,000	281.59%
2012	3,305,045,000	4,345,402,000	1,040,357,000	76.06%	365,596,000	284.56%
2013	3,518,982,000	4,694,780,000	1,175,798,000	74.96%	370,079,000	317.72%
2014	3,824,221,000	4,876,754,000	1,052,533,000	78.42%	373,774,000	281.60%
2015	4,092,647,000	5,074,333,000	981,686,000	80.65%	383,775,000	255.80%
2016	4,278,001,000	5,472,149,000	1,194,148,000	78.18%	402,535,000	296.66%
2017	4,529,508,000	5,643,444,000	1,113,936,000	80.26%	413,760,000	269.22%
2018	4,802,958,000	5,893,909,000	1,090,951,000	81.49%	431,678,000	252.72%
2019	4,971,225,000	6,086,654,000	1,115,429,000	81.67%	457,759,000	243.67%

## 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 AS OF JUNE 30, 2019 (\$ IN '000s)

	Regular	Settlement Benefit Section 6	Settlement Benefit Section 8	Settlement Benefit Section 9	Total
Actuarial Present Value of Future Benefits					
• Present value of benefits for retired members and beneficiaries	\$2,973,193	\$694,561	\$72,606	\$51,948	\$3,792,308
• Present value of benefits for inactive vested members	244,183	77,089	0	3,356	324,628
• Present value of benefits for active members	<u>2,338,898</u>	<u>492,412</u>	<u>0</u>	<u>24,157</u>	<u>2,855,467</u>
<b>Total Actuarial Present Value of Future Benefits</b>	<b><u>\$5,556,274</u></b>	<b><u>\$1,264,062</u></b>	<b><u>\$72,606</u></b>	<b><u>\$79,461</u></b>	<b><u>\$6,972,403</u></b>
Current and future assets					
• Total Valuation Value of Assets	\$3,938,425	\$936,755	\$82,228	\$13,817	\$4,971,225
• Present value of future contributions by members	302,624	38,434	0	0	341,058
• Present value of future employer contributions for:					
» Entry age Normal Cost	474,772	64,318	0	5,601	544,691
» Unfunded Actuarial Accrued Liability	<u>840,453</u>	<u>224,555</u>	<u>(9,622)</u>	<u>60,043</u>	<u>1,115,429</u>
<b>Total of current and future assets</b>	<b><u>\$5,556,274</u></b>	<b><u>\$1,264,062</u></b>	<b><u>\$72,606</u></b>	<b><u>\$79,461</u></b>	<b><u>\$6,972,403</u></b>

Note: Please refer to *Section 4, Exhibit II* for definition of Regular and Settlement Sections 6, 8 and 9 benefits.

## 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 10.8. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 10.8% of one year's payroll. Since actuarial gains and losses are amortized over 15 years, there would be a 0.9% 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 total plan LVR is about 13.3, but is 12.7 for General compared to 16.4 for Safety. This means, for example, that assumption changes will have a greater impact on employer contribution rates for Safety than for General.

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

## VOLATILITY RATIOS FOR YEARS ENDED JUNE 30, 2010 – 2019

Year Ended June 30	Asset Volatility Ratio			Liability Volatility Ratio		
	General	Safety	Total	General	Safety	Total
2010	6.1	7.4	6.3	9.6	12.3	10.0
2011	7.6	9.9	7.9	10.1	13.6	10.6
2012	8.3	10.4	8.6	11.3	14.9	11.9
2013	9.1	11.2	9.5	12.1	15.6	12.7
2014	10.4	13.0	10.8	12.4	16.1	13.0
2015	10.0	13.1	10.5	12.5	16.8	13.2
2016	9.5	12.0	10.0	12.9	16.8	13.6
2017	10.2	13.0	10.7	13.0	17.0	13.6
2018	10.4	13.5	10.9	12.9	17.2	13.7
2019	10.3	13.2	10.8	12.7	16.4	13.3

## 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.

This section does not contain a detailed analysis of the potential range of future measurements, but does include a concise discussion of some of the primary risks that may affect the Plan's future financial condition. We recommend a more detailed assessment of the risks to provide the Board with a better understanding of the risks inherent in the Plan that can inform both financial preparation and future decision making. This assessment would enable us to work with the Board to highlight and illustrate particular risks or potential future outcomes it may be interested in discussing and could include tailored scenario testing, sensitivity testing, stress testing and stochastic modeling. As noted in the Significant Issues section of this report, we are in discussion with the Association's staff regarding specific content for a more detailed analysis of the potential range of the impact of risk relative to the Association's future financial condition to be provided later in a stand-alone report.

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 condition 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 39, a 1% asset gain or loss (relative to the assumed investment return) translates to about 10.8% of one-year's payroll. Since actuarial gains and losses are amortized over 15 years, there would be a 0.9% 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 -0.44% to a high of 23.34%.

- 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. (The mortality tables adopted by the Board in the most recent experience study incorporate these considerations.)

- 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 Valuation Value of Assets basis has increased from 72.9% to 81.7%. This is primarily due to contributions made to amortize the UAAL (i.e., amortizing each layer of UAAL over 15 years as a level percentage of pay). For a more detailed history see *Section 2, Subsection G, Funded Status* starting on page 36.

- The geometric average investment return on the Valuation Value of Assets over the last 10 years was 6.01%. This includes a high of an 8.98% return and a low of 3.93%. The average over the last 5 years was 5.81%. 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 2013 reduced the discount rate from 7.75% to 7.25% and updated mortality tables, adding \$259<sup>1</sup> million in unfunded liability. The assumption changes in 2016 reduced the discount rate from 7.25% to 7.00% and again updated mortality tables, adding \$241<sup>2</sup> million in unfunded liability. For more details on the unfunded liability changes see *Section 3, Exhibit H, Table of Amortization Bases* starting on page 69.
- 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 74 and 75.

## Maturity Measures

In the last 10 years the ratio of members in pay status to active participants has increased from 0.81 to 1.00. 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 \$14 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 39.

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<sup>1</sup> Includes additional \$7 million in Section 8 UAAL and Section 9 UAAL due to changes in actuarial assumptions as of June 30, 2013.

<sup>2</sup> Includes additional \$7 million in Section 8 UAAL and Section 9 UAAL due to changes in actuarial assumptions as of June 30, 2016.

## Section 3: Supplemental Information

### EXHIBIT A – TABLE OF PLAN COVERAGE TOTAL PLAN

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	7,676	7,458	2.9%
• Average age	42.3	42.6	-0.3
• Average years of service	10.0	10.2	-0.2
• Total projected compensation	\$457,758,858	\$431,678,317	6.0%
• Average projected compensation	\$59,635	\$57,881	3.0%
• Account balances	\$344,694,547	\$327,242,864	5.3%
<b>Inactive vested members:</b>			
• Number	3,873	3,627	6.8%
• Average age	44.5	44.9	-0.4
<b>Retired members:</b>			
• Number in pay status	6,219	6,074	2.4%
• Average age	70.1	69.8	0.3
• Average monthly benefit <sup>(1)</sup>	\$3,320	\$3,223	3.0%
<b>Disabled members:</b>			
• Number in pay status	417	401	4.0%
• Average age	63.2	63.1	0.1
• Average monthly benefit <sup>(1)</sup>	\$2,779	\$2,685	3.5%
<b>Beneficiaries:</b>			
• Number in pay status	1,015	970	4.6%
• Average age	70.9	71.0	-0.1
• Average monthly benefit <sup>(1)</sup>	\$1,972	\$1,909	3.3%

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### GENERAL TIER 1

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	2,679	2,890	-7.3%
• Average age	50.0	49.5	0.5
• Average years of service	18.6	17.9	0.7
• Total projected compensation	\$181,085,724	\$188,162,141	-3.8%
• Average projected compensation	\$67,595	\$65,108	3.8%
• Account balances	\$217,201,700	\$213,563,105	1.7%
<b>Inactive vested members:</b>			
• Number	1,928	1,996	-3.4%
• Average age	50.0	49.5	0.5
<b>Retired members:</b>			
• Number in pay status	5,462	5,361	1.9%
• Average age	70.6	70.3	0.3
• Average monthly benefit <sup>(1)</sup>	\$3,139	\$3,036	3.4%
<b>Disabled members:</b>			
• Number in pay status	224	220	1.8%
• Average age	65.9	66.0	-0.1
• Average monthly benefit <sup>(1)</sup>	\$2,143	\$2,073	3.4%
<b>Beneficiaries:</b>			
• Number in pay status	803	772	4.0%
• Average age	72.0	72.2	-0.2
• Average monthly benefit <sup>(1)</sup>	\$1,882	\$1,823	3.2%

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### GENERAL TIER 2

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	99	115	-13.9%
• Average age	45.6	44.9	0.7
• Average years of service	10.1	9.1	1.0
• Total projected compensation	\$7,317,529	\$8,875,812	-17.6%
• Average projected compensation	\$73,914	\$77,181	-4.2%
• Account balances	\$3,943,585	\$4,276,519	-7.8%
<b>Inactive vested members:</b>			
• Number	125	118	5.9%
• Average age	45.0	45.0	0.0
<b>Retired members:</b>			
• Number in pay status	29	24	20.8%
• Average age	65.8	65.3	0.5
• Average monthly benefit <sup>(1)</sup>	\$1,783	\$1,783	0.0%
<b>Disabled members:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A
<b>Beneficiaries:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### GENERAL TIER 3

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	588	619	-5.0%
• Average age	43.9	43.2	0.7
• Average years of service	10.1	9.1	1.0
• Total projected compensation	\$32,508,427	\$32,267,725	0.7%
• Average projected compensation	\$55,286	\$52,129	6.1%
• Account balances	\$19,230,306	\$17,219,634	11.7%
<b>Inactive vested members:</b>			
• Number	265	264	0.4%
• Average age	41.8	41.1	0.7
<b>Retired members:</b>			
• Number in pay status	42	30	40.0%
• Average age	64.4	64.4	0.0
• Average monthly benefit <sup>(1)</sup>	\$1,255	\$1,278	-1.8%
<b>Disabled members:</b>			
• Number in pay status	9	7	28.6%
• Average age	58.2	56.9	1.3
• Average monthly benefit <sup>(1)</sup>	\$1,337	\$1,406	-4.9%
<b>Beneficiaries:</b>			
• Number in pay status	5	5	0.0%
• Average age	56.1	55.1	1.0
• Average monthly benefit <sup>(1)</sup>	\$1,086	\$1,056	2.8%

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### GENERAL TIER 4

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	241	261	-7.7%
• Average age	44.4	43.0	1.4
• Average years of service	5.5	4.9	0.6
• Total projected compensation	\$14,165,365	\$14,147,420	0.1%
• Average projected compensation	\$58,777	\$54,205	8.4%
• Account balances	\$4,359,985	\$3,879,923	12.4%
<b>Inactive vested members:</b>			
• Number	150	131	14.5%
• Average age	41.7	41.2	0.5
<b>Retired members:</b>			
• Number in pay status	1	0	N/A
• Average age	57.4	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	\$592	N/A	N/A
<b>Disabled members:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A
<b>Beneficiaries:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### GENERAL TIER 5

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	3,070	2,635	16.5%
• Average age	36.2	35.9	0.3
• Average years of service	2.6	2.2	0.4
• Total projected compensation	\$144,974,882	\$116,689,715	24.2%
• Average projected compensation	\$47,223	\$44,285	6.6%
• Account balances	\$23,848,731	\$16,400,094	45.4%
<b>Inactive vested members:</b>			
• Number	1,054	798	32.1%
• Average age	36.2	36.1	0.1
<b>Retired members:</b>			
• Number in pay status	3	0	N/A
• Average age	60.8	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	\$1,298	N/A	N/A
<b>Disabled members:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A
<b>Beneficiaries:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### SAFETY TIER 1

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	435	475	-8.4%
• Average age	46.9	46.4	0.5
• Average years of service	19.5	18.7	0.8
• Total projected compensation	\$40,567,108	\$42,202,210	-3.9%
• Average projected compensation	\$93,258	\$88,847	5.0%
• Account balances	\$62,711,882	\$61,546,172	1.9%
<b>Inactive vested members:</b>			
• Number	198	206	-3.9%
• Average age	48.5	47.9	0.6
<b>Retired members:</b>			
• Number in pay status	681	659	3.3%
• Average age	66.5	66.4	0.1
• Average monthly benefit <sup>(1)</sup>	\$4,984	\$4,887	2.0%
<b>Disabled members:</b>			
• Number in pay status	182	173	5.2%
• Average age	60.3	59.8	0.5
• Average monthly benefit <sup>(1)</sup>	\$3,632	\$3,518	3.2%
<b>Beneficiaries:</b>			
• Number in pay status	207	193	7.3%
• Average age	66.8	66.5	0.3
• Average monthly benefit <sup>(1)</sup>	\$2,344	\$2,275	3.0%

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### SAFETY TIER 2

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	52	59	-11.9%
• Average age	39.9	38.7	1.2
• Average years of service	10.0	8.8	1.2
• Total projected compensation	\$4,359,816	\$4,645,296	-6.1%
• Average projected compensation	\$83,843	\$78,734	6.5%
• Account balances	\$3,813,782	\$3,583,985	6.4%
<b>Inactive vested members:</b>			
• Number	27	23	17.4%
• Average age	37.5	36.9	0.6
<b>Retired members:</b>			
• Number in pay status	1	0	N/A
• Average age	59.8	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	\$2,768	N/A	N/A
<b>Disabled members:</b>			
• Number in pay status	1	0	N/A
• Average age	36.0	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	\$3,749	N/A	N/A
<b>Beneficiaries:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### SAFETY TIER 4

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	60	60	0.0%
• Average age	37.0	35.5	1.5
• Average years of service	6.0	5.2	0.8
• Total projected compensation	\$4,630,390	\$4,293,022	7.9%
• Average projected compensation	\$77,173	\$71,550	7.9%
• Account balances	\$2,207,597	\$1,759,593	25.5%
<b>Inactive vested members:</b>			
• Number	22	19	15.8%
• Average age	36.8	36.9	-0.1
<b>Retired members:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A
<b>Disabled members:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A
<b>Beneficiaries:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

## EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)

### SAFETY TIER 5

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
<b>Active members in valuation:</b>			
• Number	452	344	31.4%
• Average age	30.7	30.8	-0.1
• Average years of service	2.5	2.4	0.1
• Total projected compensation	\$28,149,617	\$20,394,976	38.0%
• Average projected compensation	\$62,278	\$59,288	5.0%
• Account balances	\$7,376,981	\$5,013,838	47.1%
<b>Inactive vested members:</b>			
• Number	104	72	44.4%
• Average age	32.2	32.0	0.2
<b>Retired members:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A
<b>Disabled members:</b>			
• Number in pay status	1	1	0.0%
• Average age	45.5	44.5	1.0
• Average monthly benefit <sup>(1)</sup>	\$2,051	\$2,051	0.0%
<b>Beneficiaries:</b>			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit <sup>(1)</sup>	N/A	N/A	N/A

<sup>(1)</sup> Benefits include regular and settlement benefits but exclude non-vested supplemental benefits.

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

Age	Years of Service									
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	243	243	--	--	--	--	--	--	--	--
	\$42,875	\$42,875	--	--	--	--	--	--	--	--
25 - 29	1,015	953	62	--	--	--	--	--	--	--
	\$47,309	\$46,858	\$54,248	--	--	--	--	--	--	--
30 - 34	1,098	757	284	55	2	--	--	--	--	--
	\$53,330	\$50,521	\$59,829	\$58,500	\$51,628	--	--	--	--	--
35 - 39	1,136	456	273	322	84	1	--	--	--	--
	\$57,835	\$49,692	\$58,034	\$66,949	\$66,295	\$70,988	--	--	--	--
40 - 44	1,096	260	153	280	337	66	--	--	--	--
	\$64,699	\$50,137	\$59,914	\$69,993	\$71,820	\$74,336	--	--	--	--
45 - 49	1,032	163	105	175	320	227	42	--	--	--
	\$67,102	\$47,803	\$55,308	\$67,365	\$71,661	\$78,495	\$74,083	--	--	--
50 - 54	856	139	83	109	189	187	123	26	--	--
	\$68,672	\$52,005	\$54,619	\$67,086	\$66,471	\$78,707	\$84,270	\$79,330	--	--
55 - 59	699	116	71	92	145	113	112	47	3	--
	\$65,559	\$52,311	\$58,376	\$62,476	\$64,766	\$68,433	\$78,987	\$79,380	\$54,647	--
60 - 64	379	70	46	52	93	68	34	8	8	--
	\$60,451	\$50,940	\$52,934	\$61,978	\$60,746	\$66,144	\$68,932	\$67,803	\$81,752	--
65 - 69	97	18	19	19	19	10	4	5	2	1
	\$59,416	\$37,200	\$54,468	\$61,600	\$67,902	\$60,931	\$112,845	\$57,754	\$45,756	\$157,369
70 & over	25	3	2	6	5	4	1	2	--	2
	\$64,880	\$75,414	\$38,661	\$76,147	\$66,780	\$54,625	\$41,268	\$45,304	--	\$88,641
<b>Total</b>	<b>7,676</b>	<b>3,178</b>	<b>1,098</b>	<b>1,110</b>	<b>1,194</b>	<b>676</b>	<b>316</b>	<b>88</b>	<b>13</b>	<b>3</b>
	<b>\$59,635</b>	<b>\$48,636</b>	<b>\$57,739</b>	<b>\$66,732</b>	<b>\$68,706</b>	<b>\$74,811</b>	<b>\$79,619</b>	<b>\$76,310</b>	<b>\$69,959</b>	<b>\$111,550</b>

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

Age	Years of Service									
	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	--	--	--	--	--	--	--
	\$44,903	--	\$44,903	--	--	--	--	--	--	--
30 - 34	44	1	13	28	2	--	--	--	--	--
	\$55,697	\$43,882	\$48,218	\$59,882	\$51,628	--	--	--	--	--
35 - 39	252	1	23	161	66	1	--	--	--	--
	\$62,583	\$45,511	\$59,563	\$64,054	\$60,178	\$70,988	--	--	--	--
40 - 44	504	3	17	175	261	48	--	--	--	--
	\$68,114	\$51,957	\$78,265	\$69,812	\$66,663	\$67,226	--	--	--	--
45 - 49	600	--	20	118	250	179	33	--	--	--
	\$67,898	--	\$63,198	\$64,981	\$65,934	\$73,477	\$65,786	--	--	--
50 - 54	510	1	6	76	162	156	86	23	--	--
	\$71,251	\$53,021	\$53,121	\$70,696	\$64,163	\$76,187	\$76,165	\$76,672	--	--
55 - 59	458	1	6	61	135	106	104	42	3	--
	\$69,286	\$31,176	\$62,671	\$64,735	\$65,236	\$67,727	\$76,952	\$76,762	\$54,647	--
60 - 64	237	--	4	35	84	67	32	8	7	--
	\$63,496	--	\$34,719	\$64,373	\$60,367	\$65,977	\$67,397	\$67,803	\$66,608	--
65 - 69	57	1	2	14	19	10	4	5	2	--
	\$64,728	\$45,245	\$40,826	\$59,394	\$67,902	\$60,931	\$112,845	\$57,754	\$45,756	--
70 & over	16	--	--	3	4	4	1	2	--	2
	\$58,884	--	--	\$48,943	\$66,915	\$54,625	\$41,268	\$45,304	--	\$88,641
<b>Total</b>	<b>2,679</b>	<b>8</b>	<b>92</b>	<b>671</b>	<b>983</b>	<b>571</b>	<b>260</b>	<b>80</b>	<b>12</b>	<b>2</b>
	<b>\$67,595</b>	<b>\$46,838</b>	<b>\$60,341</b>	<b>\$66,211</b>	<b>\$64,891</b>	<b>\$71,389</b>	<b>\$74,513</b>	<b>\$73,866</b>	<b>\$60,142</b>	<b>\$88,641</b>

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

Age	Years of Service									
	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	14	1	13	--	--	--	--	--	--	--
	\$75,405	\$62,942	\$76,363	--	--	--	--	--	--	--
35 - 39	21	--	12	9	--	--	--	--	--	--
	\$72,746	--	\$65,179	\$82,835	--	--	--	--	--	--
40 - 44	21	--	7	14	--	--	--	--	--	--
	\$82,578	--	\$70,900	\$88,417	--	--	--	--	--	--
45 - 49	12	--	3	7	1	1	--	--	--	--
	\$73,397	--	\$68,492	\$72,967	\$82,279	\$82,236	--	--	--	--
50 - 54	12	1	5	6	--	--	--	--	--	--
	\$73,402	\$44,583	\$64,420	\$85,690	--	--	--	--	--	--
55 - 59	11	--	5	6	--	--	--	--	--	--
	\$59,458	--	\$60,660	\$58,456	--	--	--	--	--	--
60 - 64	5	--	1	3	1	--	--	--	--	--
	\$55,897	--	\$55,507	\$56,214	\$55,334	--	--	--	--	--
65 - 69	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
70 & over	3	--	--	2	1	--	--	--	--	--
	\$101,653	--	--	\$119,360	\$66,239	--	--	--	--	--
<b>Total</b>	<b>99</b>	<b>2</b>	<b>46</b>	<b>47</b>	<b>3</b>	<b>1</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
	<b>\$73,914</b>	<b>\$53,763</b>	<b>\$68,643</b>	<b>\$80,135</b>	<b>\$67,951</b>	<b>\$82,236</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

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

Age	Years of Service									
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	7	2	5	--	--	--	--	--	--	--
	\$41,866	\$31,504	\$46,011	--	--	--	--	--	--	--
30 - 34	77	2	51	24	--	--	--	--	--	--
	\$52,667	\$45,496	\$53,073	\$52,402	--	--	--	--	--	--
35 - 39	176	3	79	94	--	--	--	--	--	--
	\$55,463	\$53,853	\$53,015	\$57,572	--	--	--	--	--	--
40 - 44	104	1	36	59	5	3	--	--	--	--
	\$57,259	\$107,636	\$55,231	\$58,753	\$46,384	\$53,540	--	--	--	--
45 - 49	71	--	31	34	5	1	--	--	--	--
	\$59,594	--	\$52,340	\$65,427	\$65,914	\$54,492	--	--	--	--
50 - 54	60	2	26	25	4	3	--	--	--	--
	\$53,184	\$65,471	\$53,860	\$50,622	\$45,222	\$71,114	--	--	--	--
55 - 59	54	1	25	22	6	--	--	--	--	--
	\$53,886	\$35,253	\$57,131	\$53,862	\$43,558	--	--	--	--	--
60 - 64	29	--	14	11	4	--	--	--	--	--
	\$53,154	--	\$56,752	\$51,941	\$43,892	--	--	--	--	--
65 - 69	8	--	4	4	--	--	--	--	--	--
	\$58,181	--	\$56,472	\$59,889	--	--	--	--	--	--
70 & over	2	1	--	1	--	--	--	--	--	--
	\$52,311	\$33,285	--	\$71,338	--	--	--	--	--	--
<b>Total</b>	<b>588</b>	<b>12</b>	<b>271</b>	<b>274</b>	<b>24</b>	<b>7</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
	<b>\$55,286</b>	<b>\$51,890</b>	<b>\$53,819</b>	<b>\$57,274</b>	<b>\$49,137</b>	<b>\$61,208</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

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

Age	Years of Service									
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	6	1	5	--	--	--	--	--	--	--
	\$68,748	\$61,703	\$70,157	--	--	--	--	--	--	--
30 - 34	51	10	41	--	--	--	--	--	--	--
	\$63,730	\$58,883	\$64,912	--	--	--	--	--	--	--
35 - 39	49	14	33	2	--	--	--	--	--	--
	\$58,257	\$43,781	\$63,635	\$70,855	--	--	--	--	--	--
40 - 44	36	14	21	1	--	--	--	--	--	--
	\$63,707	\$60,708	\$65,302	\$72,206	--	--	--	--	--	--
45 - 49	26	10	16	--	--	--	--	--	--	--
	\$49,725	\$42,774	\$54,069	--	--	--	--	--	--	--
50 - 54	23	4	19	--	--	--	--	--	--	--
	\$54,640	\$59,051	\$53,711	--	--	--	--	--	--	--
55 - 59	25	13	12	--	--	--	--	--	--	--
	\$62,585	\$62,616	\$62,552	--	--	--	--	--	--	--
60 - 64	16	7	9	--	--	--	--	--	--	--
	\$47,794	\$46,939	\$48,458	--	--	--	--	--	--	--
65 - 69	9	3	6	--	--	--	--	--	--	--
	\$52,856	\$36,880	\$60,844	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>241</b>	<b>76</b>	<b>162</b>	<b>3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
	<b>\$58,777</b>	<b>\$53,033</b>	<b>\$61,240</b>	<b>\$71,305</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

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

Age	Years of Service									
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	182	182	--	--	--	--	--	--	--	--
	\$37,369	\$37,369	--	--	--	--	--	--	--	--
25 - 29	802	762	40	--	--	--	--	--	--	--
	\$43,829	\$43,520	\$49,705	--	--	--	--	--	--	--
30 - 34	761	647	114	--	--	--	--	--	--	--
	\$49,676	\$48,631	\$55,610	--	--	--	--	--	--	--
35 - 39	491	396	94	1	--	--	--	--	--	--
	\$49,621	\$48,157	\$54,993	\$124,180	--	--	--	--	--	--
40 - 44	289	230	57	--	2	--	--	--	--	--
	\$48,826	\$48,545	\$50,266	--	\$40,064	--	--	--	--	--
45 - 49	171	147	24	--	--	--	--	--	--	--
	\$46,440	\$46,663	\$45,076	--	--	--	--	--	--	--
50 - 54	151	128	23	--	--	--	--	--	--	--
	\$50,722	\$50,867	\$49,915	--	--	--	--	--	--	--
55 - 59	119	97	21	--	--	--	--	1	--	--
	\$50,353	\$48,857	\$53,745	--	--	--	--	\$124,180	--	--
60 - 64	80	63	16	1	--	--	--	--	--	--
	\$50,998	\$51,385	\$50,522	\$34,247	--	--	--	--	--	--
65 - 69	20	14	6	--	--	--	--	--	--	--
	\$40,145	\$36,694	\$48,200	--	--	--	--	--	--	--
70 & over	4	2	2	--	--	--	--	--	--	--
	\$67,570	\$96,479	\$38,661	--	--	--	--	--	--	--
<b>Total</b>	<b>3,070</b>	<b>2,668</b>	<b>397</b>	<b>2</b>	<b>2</b>	<b>--</b>	<b>--</b>	<b>1</b>	<b>--</b>	<b>--</b>
	<b>\$47,223</b>	<b>\$46,371</b>	<b>\$52,634</b>	<b>\$79,213</b>	<b>\$40,064</b>	<b>--</b>	<b>--</b>	<b>\$124,180</b>	<b>--</b>	<b>--</b>

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

Age	Years of Service									
	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	58	--	1	39	18	--	--	--	--	--
	\$86,283	--	\$64,120	\$85,724	\$88,724	--	--	--	--	--
40 - 44	114	--	2	28	69	15	--	--	--	--
	\$92,180	--	\$72,753	\$83,999	\$94,091	\$101,246	--	--	--	--
45 - 49	136	--	2	15	64	46	9	--	--	--
	\$95,192	--	\$76,239	\$85,854	\$94,314	\$98,462	\$104,504	--	--	--
50 - 54	93	--	1	1	23	28	37	3	--	--
	\$95,383	--	\$69,122	\$80,112	\$86,423	\$93,556	\$103,108	\$99,708	--	--
55 - 59	25	--	--	2	4	7	8	4	--	--
	\$91,213	--	--	\$88,705	\$80,712	\$79,112	\$105,452	\$95,670	--	--
60 - 64	8	--	--	--	4	1	2	--	1	--
	\$99,968	--	--	--	\$86,911	\$77,361	\$93,484	--	\$187,765	--
65 - 69	1	--	--	--	--	--	--	--	--	1
	\$157,369	--	--	--	--	--	--	--	--	\$157,369
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>435</b>	--	<b>6</b>	<b>85</b>	<b>182</b>	<b>97</b>	<b>56</b>	<b>7</b>	<b>1</b>	<b>1</b>
	<b>\$93,258</b>	--	<b>\$71,871</b>	<b>\$85,183</b>	<b>\$92,218</b>	<b>\$95,862</b>	<b>\$103,323</b>	<b>\$97,400</b>	<b>\$187,765</b>	<b>\$157,369</b>

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

Age	Years of Service									
	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	14	--	11	3	--	--	--	--	--	--
	\$78,374	--	\$74,010	\$94,375	--	--	--	--	--	--
35 - 39	20	--	4	16	--	--	--	--	--	--
	\$87,923	--	\$70,004	\$92,402	--	--	--	--	--	--
40 - 44	10	--	7	3	--	--	--	--	--	--
	\$78,401	--	\$75,964	\$84,088	--	--	--	--	--	--
45 - 49	2	--	1	1	--	--	--	--	--	--
	\$84,072	--	\$70,184	\$97,959	--	--	--	--	--	--
50 - 54	2	--	1	1	--	--	--	--	--	--
	\$85,630	--	\$91,587	\$79,674	--	--	--	--	--	--
55 - 59	1	--	--	1	--	--	--	--	--	--
	\$85,798	--	--	\$85,798	--	--	--	--	--	--
60 - 64	2	--	--	2	--	--	--	--	--	--
	\$97,787	--	--	\$97,787	--	--	--	--	--	--
65 - 69	1	--	--	1	--	--	--	--	--	--
	\$99,331	--	--	\$99,331	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>52</b>	--	<b>24</b>	<b>28</b>	--	--	--	--	--	--
	<b>\$83,843</b>	--	<b>\$74,485</b>	<b>\$91,863</b>	--	--	--	--	--	--

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

Age	Years of Service									
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
25 - 29	6	1	5	--	--	--	--	--	--	--
	\$69,037	\$66,460	\$69,553	--	--	--	--	--	--	--
30 - 34	22	3	19	--	--	--	--	--	--	--
	\$73,843	\$87,904	\$71,623	--	--	--	--	--	--	--
35 - 39	19	6	13	--	--	--	--	--	--	--
	\$80,139	\$90,662	\$75,282	--	--	--	--	--	--	--
40 - 44	4	1	3	--	--	--	--	--	--	--
	\$69,128	\$75,632	\$66,960	--	--	--	--	--	--	--
45 - 49	5	2	3	--	--	--	--	--	--	--
	\$83,758	\$105,260	\$69,424	--	--	--	--	--	--	--
50 - 54	2	--	2	--	--	--	--	--	--	--
	\$81,483	--	\$81,483	--	--	--	--	--	--	--
55 - 59	1	--	1	--	--	--	--	--	--	--
	\$83,565	--	\$83,565	--	--	--	--	--	--	--
60 - 64	1	--	1	--	--	--	--	--	--	--
	\$127,146	--	\$127,146	--	--	--	--	--	--	--
65 - 69	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>60</b>	<b>13</b>	<b>47</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
	<b>\$77,173</b>	<b>\$89,253</b>	<b>\$73,832</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

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

Age	Years of Service									
	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	61	61	--	--	--	--	--	--	--	--
	\$59,303	\$59,303	--	--	--	--	--	--	--	--
25 - 29	193	187	6	--	--	--	--	--	--	--
	\$60,640	\$60,438	\$66,940	--	--	--	--	--	--	--
30 - 34	115	93	22	--	--	--	--	--	--	--
	\$62,773	\$61,610	\$67,692	--	--	--	--	--	--	--
35 - 39	50	36	14	--	--	--	--	--	--	--
	\$62,728	\$61,814	\$65,077	--	--	--	--	--	--	--
40 - 44	14	11	3	--	--	--	--	--	--	--
	\$65,594	\$61,922	\$79,056	--	--	--	--	--	--	--
45 - 49	9	4	5	--	--	--	--	--	--	--
	\$70,187	\$73,548	\$67,498	--	--	--	--	--	--	--
50 - 54	3	3	--	--	--	--	--	--	--	--
	\$84,328	\$84,328	--	--	--	--	--	--	--	--
55 - 59	5	4	1	--	--	--	--	--	--	--
	\$104,551	\$112,130	\$74,238	--	--	--	--	--	--	--
60 - 64	1	--	1	--	--	--	--	--	--	--
	\$74,413	--	\$74,413	--	--	--	--	--	--	--
65 - 69	1	--	1	--	--	--	--	--	--	--
	\$73,096	--	\$73,096	--	--	--	--	--	--	--
70 & over	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>452</b>	<b>399</b>	<b>53</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
	<b>\$62,278</b>	<b>\$61,532</b>	<b>\$67,893</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

## EXHIBIT C – RECONCILIATION OF MEMBER DATA

	Active Members	Inactive Vested Members	Retired Members	Disabled	Beneficiaries	Total
<b>Number as of June 30, 2018</b>	<b>7,458</b>	<b>3,627</b>	<b>6,074</b>	<b>401</b>	<b>970</b>	<b>18,530</b>
• New members	902	98	N/A	N/A	N/A	1,000
• Terminations	(367)	367	N/A	N/A	N/A	0
• Contribution refunds	(133)	(70)	N/A	N/A	N/A	(203)
• Retirements	(207)	(86)	293	N/A	N/A	0
• New disabilities	(12)	(6)	(4)	22	N/A	0
• Return to work	43	(43)	0	0	N/A	0
• Died with or without beneficiary	(8)	(14)	(144)	(6)	46 <sup>(1)</sup>	(126)
• Data adjustments	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>(1)</u>	<u>(1)</u>
<b>Number as of June 30, 2019</b>	<b>7,676</b>	<b>3,873</b>	<b>6,219</b>	<b>417</b>	<b>1,015</b>	<b>19,200</b>

<sup>(1)</sup> This is the net increase of beneficiaries after subtracting the number of beneficiaries who died during the year.

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

	Year Ended June 30, 2019	Year Ended June 30, 2018
<b>Net assets at market value at the beginning of the year</b>	<b>\$4,699,871,406</b>	<b>\$4,407,221,766</b>
<b>Contribution income:</b>		
• Employer contributions	\$225,491,692	\$210,534,894
• Member contributions	40,463,120	38,467,001
• Less administrative fees	<u>(5,980,558)</u>	<u>(5,676,721)</u>
Net contribution income	\$259,974,254	\$243,325,174
<b>Investment income:</b>		
• Interest, dividends, asset appreciation and other income	\$282,651,036	\$338,977,778
• Less investment fees	<u>(27,957,378)</u>	<u>(26,421,765)</u>
Net investment income	<u>\$254,693,657</u>	<u>\$312,556,013</u>
<b>Total income available for benefits</b>	<b>\$514,667,911</b>	<b>\$555,881,187</b>
<b>Less benefit payments:</b>		
• Service retirement	\$(271,068,399)	\$(254,737,024)
• Death benefits	(1,492,271)	(1,405,467)
• Members refunds	(2,614,989)	(2,408,213)
• Health benefit subsidies	<u>(4,856,581)</u>	<u>(4,680,842)</u>
Net benefit payments	<u>\$(280,032,239)</u>	<u>\$(263,231,547)</u>
<b>Change in net assets at market value</b>	<b>\$234,635,672</b>	<b>\$292,649,640</b>
<b>Net assets at market value at the end of the year</b>	<b>\$4,934,507,078</b>	<b>\$4,699,871,406</b>

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	\$267,579,821	\$281,392,007
<b>Accounts receivable:</b>		
• Investment trades	\$67,110,774	\$20,456,648
• Interest and dividends	18,570,603	16,622,822
• Contributions and others	10,378,197	9,074,025
• Securities lending	<u>101,424</u>	<u>61,843</u>
Total accounts receivable	\$96,160,997	\$46,215,339
<b>Investments:</b>		
• Equities	\$1,783,515,280	\$1,626,170,409
• Fixed income	1,513,420,016	1,551,351,371
• Real estate	20,016,303	22,904,393
• Securities lending collateral	31,757,439	31,214,977
• Capital assets	10,895,550	11,512,614
• Private markets and derivatives	<u>1,345,027,485</u>	<u>1,192,669,627</u>
Total investments at market value	<u>\$4,704,632,072</u>	<u>\$4,435,823,391</u>
Total assets	\$5,068,372,891	\$4,763,430,737
<b>Accounts payable:</b>		
• Investment trades	\$(99,578,820)	\$(29,492,230)
• Cash collateral payable for securities lending	(31,757,439)	(31,214,977)
• Securities lending bank and broker fees	(49,081)	(28,021)
• Others	<u>(2,480,472)</u>	<u>(2,824,104)</u>
Total accounts payable	\$(133,865,812)	\$(63,559,331)
<b>Net assets at market value</b>	<b>\$4,934,507,078</b>	<b>\$4,699,871,406</b>
<b>Net assets at actuarial value</b>	<b>\$4,971,225,226</b>	<b>\$4,802,958,346</b>
<b>Net assets at valuation value</b>	<b>\$4,971,225,226</b>	<b>\$4,802,958,346</b>

Note: Results may be slightly off due to rounding.

## EXHIBIT F – SUMMARY OF REPORTED RESERVE INFORMATION

	June 30, 2019	June 30, 2018
<b>Used in Development of Valuation Value of Assets:</b>		
<u>Regular Valuation Reserves</u>		
• Members' Accumulated Contributions	\$409,554,784	\$408,051,498
• Current Service Reserve	1,308,641,025	1,260,910,811
• Annuity Pension Reserve	170,177,539	144,840,018
• Current Service Pension Reserve	1,549,490,787	1,419,033,030
• Cost of Living Reserve	<u>1,473,755,041</u>	<u>1,353,526,603</u>
Subtotal	\$4,911,619,175	\$4,586,361,959
<u>Settlement Reserves (Section 6)</u>		
• Supplemental Annuity Reserve	\$763,434,524	\$705,413,056
• Members' Accumulated Contributions	50,961,318	52,332,679
• Current Service Reserve	291,023,608	285,253,053
• Annuity Pension Reserve	<u>55,246,247</u>	<u>42,820,454</u>
Subtotal	\$1,160,665,698	\$1,085,819,242
Settlement Reserve (Section 8)	\$115,072,753	\$112,496,209
Retiree Health Benefit Reserve (Section 9)	\$27,904,545	\$30,661,530
Contra Tracking Account	<u>\$(1,244,036,945)</u>	<u>\$(1,012,380,594)</u>
Subtotal: Valuation Value of Assets	\$4,971,225,226	\$4,802,958,346
<b>Not Used in Development of Valuation Value of Assets:</b>		
• Supplemental COLA	\$0	\$0
• Retiree Health Benefit Reserve (BOR)	0	0
• Contingency Reserve	0	0
• Board Contingency Reserve/Undistributed Earnings ("Available Earnings")	<u>0</u>	<u>0</u>
Subtotal	\$0	\$0
Subtotal: Actuarial Value of Assets	\$4,971,225,226	\$4,802,958,346
• Market Stabilization Reserve	<u>\$(36,718,148)</u>	<u>\$(103,086,939)</u>
<b>Total: Market Value of Assets</b>	<b>\$4,934,507,078</b>	<b>\$4,699,871,406</b>

Note: Results may be slightly off due to rounding.

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

Year Ended June 30	Employer Contributions	Member Contributions	Administrative Expenses	Net Investment Return <sup>(1)</sup>	Benefit Payments	Market Value of Assets at Year-End	Valuation Value of Assets at Year-End	Valuation Value as a Percent of Market Value
2010	\$126,138,168	\$32,208,668	\$0	\$337,869,234	\$171,441,220	\$2,586,687,255	\$2,983,044,156	115.32%
2011	130,289,781	31,293,249	0	601,313,325	182,406,901	3,167,176,709	3,114,482,906	98.34%
2012	157,869,172	32,627,149	0	(13,839,384)	195,320,983	3,148,512,663	3,305,045,273	104.97%
2013	158,572,420	30,515,683	0	374,807,596	212,956,631	3,499,451,731	3,518,982,097	100.56%
2014	165,309,213	30,153,934	0	579,606,657	224,392,602	4,050,128,933	3,824,221,492	94.42%
2015	184,213,235	33,109,947	0	(3,936,294)	231,396,472	4,032,119,349	4,092,647,359	101.50%
2016	191,529,239	35,211,756	4,814,003	(4,319,055)	240,231,354	4,009,495,932	4,278,001,313	106.70%
2017	198,472,119	36,259,132	4,762,253	417,603,730	249,846,894	4,407,221,766	4,529,508,479	102.77%
2018	210,534,894	38,467,001	5,676,721	312,556,013	263,231,547	4,699,871,406	4,802,958,346	102.19%
2019	225,491,692	40,463,120	5,980,558	254,693,657	280,032,239	4,934,507,078	4,971,225,226	100.74%

<sup>(1)</sup> Net of investment fees and administrative expenses prior to 2016. Starting in 2016, administrative expenses are included in a separate column.

## EXHIBIT H – TABLE OF AMORTIZATION BASES

Date Established	Source	Initial Amount (\$ in '000s)	Initial Period	Outstanding Balance (\$ in '000s)	Years Remaining	Amortization Amount (\$ in '000s)
<b>General – Regular Benefits</b>						
June 30, 2003	Restart Amortization	N/A <sup>(1)</sup>	30	\$58,863	14	\$5,443
June 30, 2004	Actuarial Loss/POB Proceeds <sup>(2)</sup>	N/A <sup>(1)</sup>	15	0	0	0
June 30, 2005	Actuarial Loss	\$165,807	15	23,616	1	24,497
June 30, 2006	Actuarial Loss	74,356	15	19,986	2	10,550
June 30, 2006	Plan Provision Change	333	30	374	17	30
June 30, 2007	Actuarial Loss	9,737	15	3,719	3	1,332
June 30, 2007	Assumption Change	48,705	15	18,603	3	6,663
June 30, 2008	Actuarial Loss	37,435	15	18,000	4	4,920
June 30, 2009	Actuarial Loss	99,661	15	56,561	5	12,586
June 30, 2010	Actuarial Loss	40,450	15	26,016	6	4,908
June 30, 2010	Assumption Change	180,478	15	116,075	6	21,898
June 30, 2011	Actuarial Loss	33,655	15	23,873	7	3,927
June 30, 2012	Actuarial Gain	(37,654)	15	(28,861)	8	(4,226)
June 30, 2013	Actuarial Gain	(55,329)	15	(45,113)	9	(5,972)
June 30, 2013	Assumption Change	152,395	15	124,257	9	16,448
June 30, 2014	Actuarial Gain	(35,958)	15	(30,909)	10	(3,745)
June 30, 2015	Actuarial Loss	1,049	15	942	11	105
June 30, 2016	Actuarial Loss	26,665	15	24,769	12	2,585
June 30, 2016	Assumption Change	146,934	15	136,484	12	14,247
June 30, 2017	Actuarial Gain	(1,696)	15	(1,623)	13	(159)
June 30, 2018	Actuarial Loss	40,262	15	39,493	14	3,652
June 30, 2019	Actuarial loss	125,047	15	125,047	15	10,970
June 30, 2019	Assumption change	(55,256)	15	(55,256)	15	(4,847)
<b>Subtotal</b>				<b>\$654,916</b>		<b>\$125,813</b>

Note: Results may be slightly off due to rounding.

<sup>(1)</sup> The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

<sup>(2)</sup> It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial loss in the June 30, 2004 valuation.

## EXHIBIT H – TABLE OF AMORTIZATION BASES (CONTINUED)

Date Established	Source	Initial Amount (\$ in '000s)	Initial Period	Outstanding Balance (\$ in '000s)	Years Remaining	Amortization Amount (\$ in '000s)
<b>General – Settlement Benefits</b>						
June 30, 2003	Restart Amortization <sup>(1)</sup>	N/A <sup>(2)</sup>	30	\$139,034	14	\$12,856
June 30, 2004	Actuarial Loss/POB Proceeds <sup>(3)</sup>	N/A <sup>(2)</sup>	15	0	0	0
June 30, 2005	Actuarial Loss	\$10,771	15	1,534	1	1,591
June 30, 2006	Actuarial Loss	8,283	15	2,226	2	1,175
June 30, 2007	Actuarial Gain	(162)	15	(62)	3	(22)
June 30, 2007	Assumption Change	37,063	15	14,156	3	5,070
June 30, 2008	Actuarial Loss	11,511	15	5,535	4	1,513
June 30, 2009	Actuarial Loss	17,637	15	10,010	5	2,227
June 30, 2010	Actuarial Loss	4,210	15	2,708	6	511
June 30, 2010	Assumption Change	38,322	15	24,647	6	4,650
June 30, 2011	Actuarial Loss	209	15	148	7	24
June 30, 2012	Actuarial Gain	(18,843)	15	(14,443)	8	(2,115)
June 30, 2013	Actuarial Gain	(20,059)	15	(16,356)	9	(2,165)
June 30, 2013	Assumption Change	41,809	15	34,089	9	4,512
June 30, 2014	Actuarial Gain	(16,375)	15	(14,076)	10	(1,705)
June 30, 2015	Actuarial Gain	(16,850)	15	(15,118)	11	(1,693)
June 30, 2016	Actuarial Gain	(2,624)	15	(2,437)	12	(254)
June 30, 2016	Assumption Change	25,697	15	23,869	12	2,492
June 30, 2017	Actuarial Gain	(8,885)	15	(8,508)	13	(833)
June 30, 2018	Actuarial Gain	(305)	15	(299)	14	(28)
June 30, 2019	Actuarial loss	15,863	15	15,863	15	1,391
June 30, 2019	Assumption change <sup>(4)</sup>	13,222	15	13,222	15	1,160
<b>Subtotal</b>				<b>\$215,743</b>		<b>\$30,358</b>

Note: Results may be slightly off due to rounding.

<sup>(1)</sup> The outstanding balance includes the full General Section 8 UAAL and General Section 9 UAAL. This also includes \$2.0 million gain for the full General Section 8 UAAL and the full General Section 9 UAAL due to changes in actuarial assumptions as of June 30, 2019.

<sup>(2)</sup> The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

<sup>(3)</sup> It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial losses in the June 30, 2004 valuation.

<sup>(4)</sup> The increase in General Settlement UAAL is primarily due to the change in retirement assumption structure.

## EXHIBIT H – TABLE OF AMORTIZATION BASES (CONTINUED)

Date Established	Source	Initial Amount (\$ in '000s)	Initial Period	Outstanding Balance (\$ in '000s)	Years Remaining	Amortization Amount (\$ in '000s)
<b>Safety – Regular Benefits</b>						
June 30, 2003	Restart Amortization	N/A <sup>(1)</sup>	30	\$20,138	14	\$1,862
June 30, 2004	Actuarial Loss/POB Proceeds <sup>(2)</sup>	N/A <sup>(1)</sup>	15	0	0	0
June 30, 2005	Actuarial Loss	\$28,456	15	4,053	1	4,204
June 30, 2006	Actuarial Loss	36,123	15	9,709	2	5,125
June 30, 2007	Actuarial Loss	11,440	15	4,370	3	1,565
June 30, 2007	Assumption Change	18,663	15	7,128	3	2,553
June 30, 2008	Actuarial Loss	25,279	15	12,155	4	3,323
June 30, 2009	Actuarial Loss	33,290	15	18,893	5	4,204
June 30, 2010	Actuarial Loss	7,016	15	4,513	6	851
June 30, 2010	Assumption Change	44,211	15	28,435	6	5,364
June 30, 2011	Actuarial Gain	(3,902)	15	(2,768)	7	(455)
June 30, 2012	Actuarial Gain	(4,728)	15	(3,624)	8	(531)
June 30, 2013	Actuarial Gain	(17,551)	15	(14,311)	9	(1,894)
June 30, 2013	Assumption Change	47,490	15	38,721	9	5,125
June 30, 2014	Actuarial Gain	(11,046)	15	(9,495)	10	(1,150)
June 30, 2015	Actuarial Gain	(375)	15	(337)	11	(38)
June 30, 2016	Actuarial Gain	(3,838)	15	(3,565)	12	(372)
June 30, 2016	Assumption Change	51,927	15	48,234	12	5,035
June 30, 2017	Actuarial Loss	1,282	15	1,228	13	120
June 30, 2018	Actuarial Loss	15,872	15	15,568	14	1,440
June 30, 2019	Actuarial loss	29,593	15	29,593	15	2,596
June 30, 2019	Assumption change	(23,103)	15	(23,103)	15	(2,026)
<b>Subtotal</b>				<b>\$185,537</b>		<b>\$36,902</b>

Note: Results may be slightly off due to rounding.

<sup>(1)</sup> The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

<sup>(2)</sup> It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial loss in the June 30, 2004 valuation.

## EXHIBIT H – TABLE OF AMORTIZATION BASES (CONTINUED)

Date Established	Source	Initial Amount (\$ in '000s)	Initial Period	Outstanding Balance (\$ in '000s)	Years Remaining	Amortization Amount (\$ in '000s)
<b>Safety – Settlement Benefits</b>						
June 30, 2003	Restart Amortization <sup>(1)</sup>	N/A <sup>(2)</sup>	30	\$23,925	14	\$2,212
June 30, 2004	Actuarial Loss/POB Proceeds <sup>(3)</sup>	N/A <sup>(2)</sup>	15	0	0	0
June 30, 2005	Actuarial Gain	\$(8,133)	15	(1,158)	1	(1,202)
June 30, 2006	Actuarial Loss	6,886	15	1,851	2	977
June 30, 2007	Actuarial Loss	811	15	310	3	111
June 30, 2007	Assumption Change	4,474	15	1,709	3	612
June 30, 2008	Actuarial Loss	4,845	15	2,330	4	637
June 30, 2009	Actuarial Loss	7,849	15	4,455	5	991
June 30, 2010	Actuarial Loss	1,273	15	818	6	154
June 30, 2010	Assumption Change	6,935	15	4,460	6	841
June 30, 2011	Actuarial Gain	(434)	15	(308)	7	(51)
June 30, 2012	Actuarial Gain	(1,098)	15	(842)	8	(123)
June 30, 2013	Actuarial Gain	(3,609)	15	(2,943)	9	(390)
June 30, 2013	Assumption Change	10,467	15	8,534	9	1,130
June 30, 2014	Actuarial Gain	(2,617)	15	(2,250)	10	(273)
June 30, 2015	Actuarial Gain	(7,408)	15	(6,646)	11	(744)
June 30, 2016	Actuarial Loss	5,491	15	5,101	12	532
June 30, 2016	Assumption Change	9,148	15	8,497	12	887
June 30, 2017	Actuarial Gain	(278)	15	(267)	13	(26)
June 30, 2018	Actuarial Loss	910	15	893	14	83
June 30, 2019	Actuarial loss	4,094	15	4,094	15	359
June 30, 2019	Assumption change <sup>(4)</sup>	6,670	15	<u>6,670</u>	15	<u>585</u>
<b>Subtotal</b>				<b>\$59,233</b>		<b>\$7,304</b>

Note: Results may be slightly off due to rounding.

<sup>(1)</sup> The outstanding balance includes the full Safety Section 8 UAAL and Safety Section 9 UAAL. This also includes \$0.4 million gain for the full Safety Section 8 UAAL and the full Safety Section 9 UAAL due to changes in actuarial assumptions as of June 30, 2019.

<sup>(2)</sup> The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

<sup>(3)</sup> It appears that the proceeds from the Pension Obligation Bonds issued by the County were used to offset the actuarial losses in the June 30, 2004 valuation.

<sup>(4)</sup> The increase in General Settlement UAAL is primarily due to the change in retirement assumption structure.

## EXHIBIT H – TABLE OF AMORTIZATION BASES (CONTINUED)

Date Established	Source	Initial Amount (\$ in '000s)	Initial Period	Outstanding Balance (\$ in '000s)	Years Remaining	Amortization Amount (\$ in '000s)
<b>Total</b>						
June 30, 2003	Restart Amortization <sup>(1)</sup>	N/A <sup>(2)</sup>	30	\$241,961	14	\$22,374
June 30, 2005	Actuarial Loss	\$196,901	15	28,045	1	29,090
June 30, 2006	Actuarial Loss	125,647	15	33,773	2	17,828
June 30, 2006	Plan Provision Change	333	30	374	17	30
June 30, 2007	Actuarial Loss	21,825	15	8,336	3	2,986
June 30, 2007	Assumption Change	108,905	15	41,597	3	14,899
June 30, 2008	Actuarial Loss	79,071	15	38,020	4	10,393
June 30, 2009	Actuarial Loss	158,438	15	89,919	5	20,008
June 30, 2010	Actuarial Loss	52,950	15	34,055	6	6,425
June 30, 2010	Assumption Change	269,946	15	173,617	6	32,754
June 30, 2011	Actuarial Loss	29,527	15	20,945	7	3,446
June 30, 2012	Actuarial Gain	(62,323)	15	(47,770)	8	(6,994)
June 30, 2013	Actuarial Gain	(96,549)	15	(78,722)	9	(10,420)
June 30, 2013	Assumption Change	252,161	15	205,602	9	27,215
June 30, 2014	Actuarial Gain	(65,995)	15	(56,729)	10	(6,873)
June 30, 2015	Actuarial Gain	(23,584)	15	(21,160)	11	(2,370)
June 30, 2016	Actuarial Loss	25,694	15	23,867	12	2,491
June 30, 2016	Assumption Change	233,706	15	217,085	12	22,660
June 30, 2017	Actuarial Gain	(9,579)	15	(9,170)	13	(898)
June 30, 2018	Actuarial Loss	56,739	15	55,654	14	5,146
June 30, 2019	Actuarial loss	174,597	15	174,597	15	15,316
June 30, 2019	Assumption change <sup>(3)</sup>	(58,467)	15	(58,467)	15	(5,129)
<b>Grand Total</b>				<b>\$1,115,429</b>		<b>\$200,377</b>

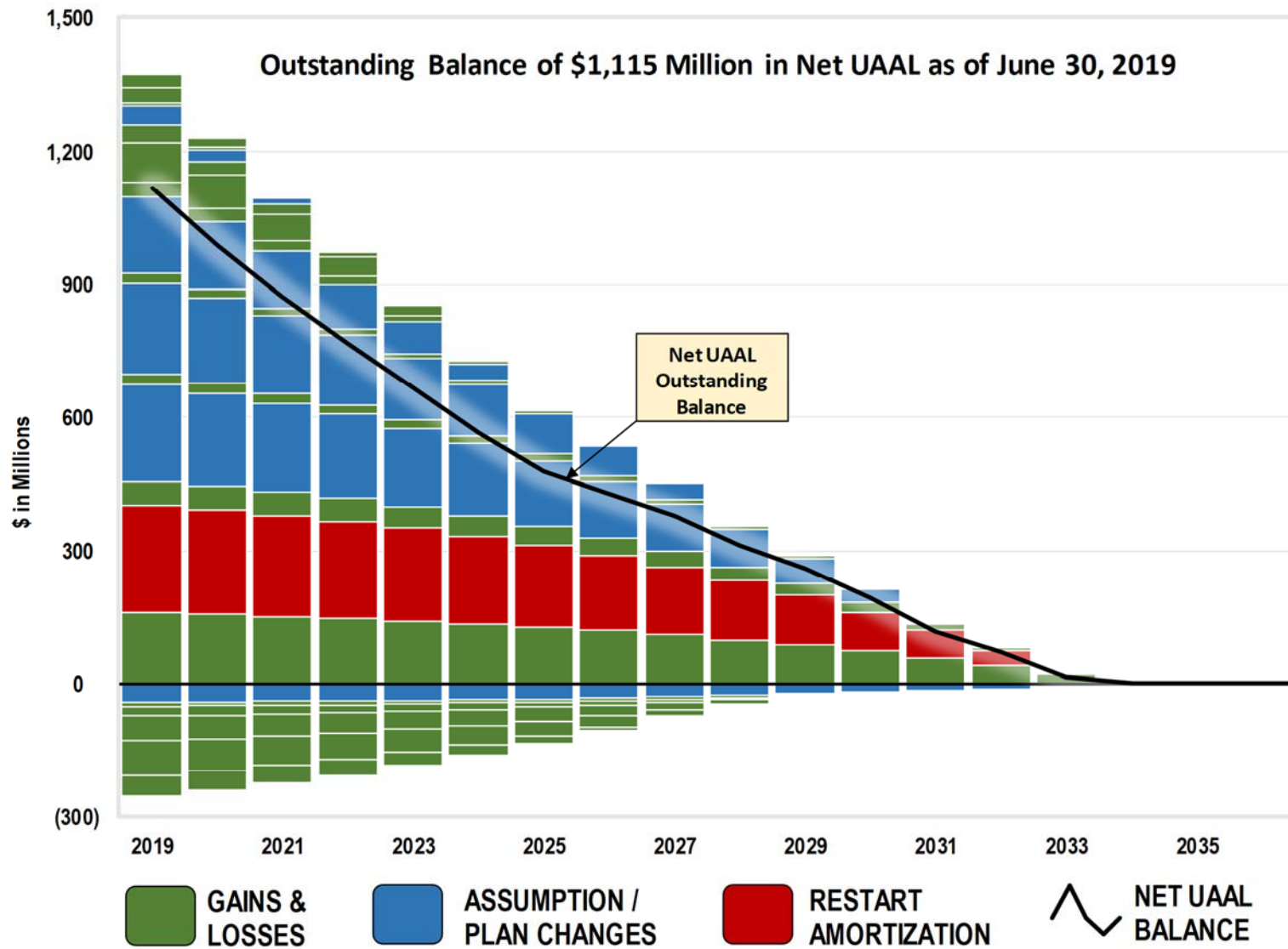
Note: Results may be slightly off due to rounding.

<sup>(1)</sup> The outstanding balance includes the full Section 8 UAAL and Section 9 UAAL. This also includes \$2.4 million gain for the full Section 8 UAAL and the full Section 9 UAAL due to changes in actuarial assumptions as of June 30, 2019.

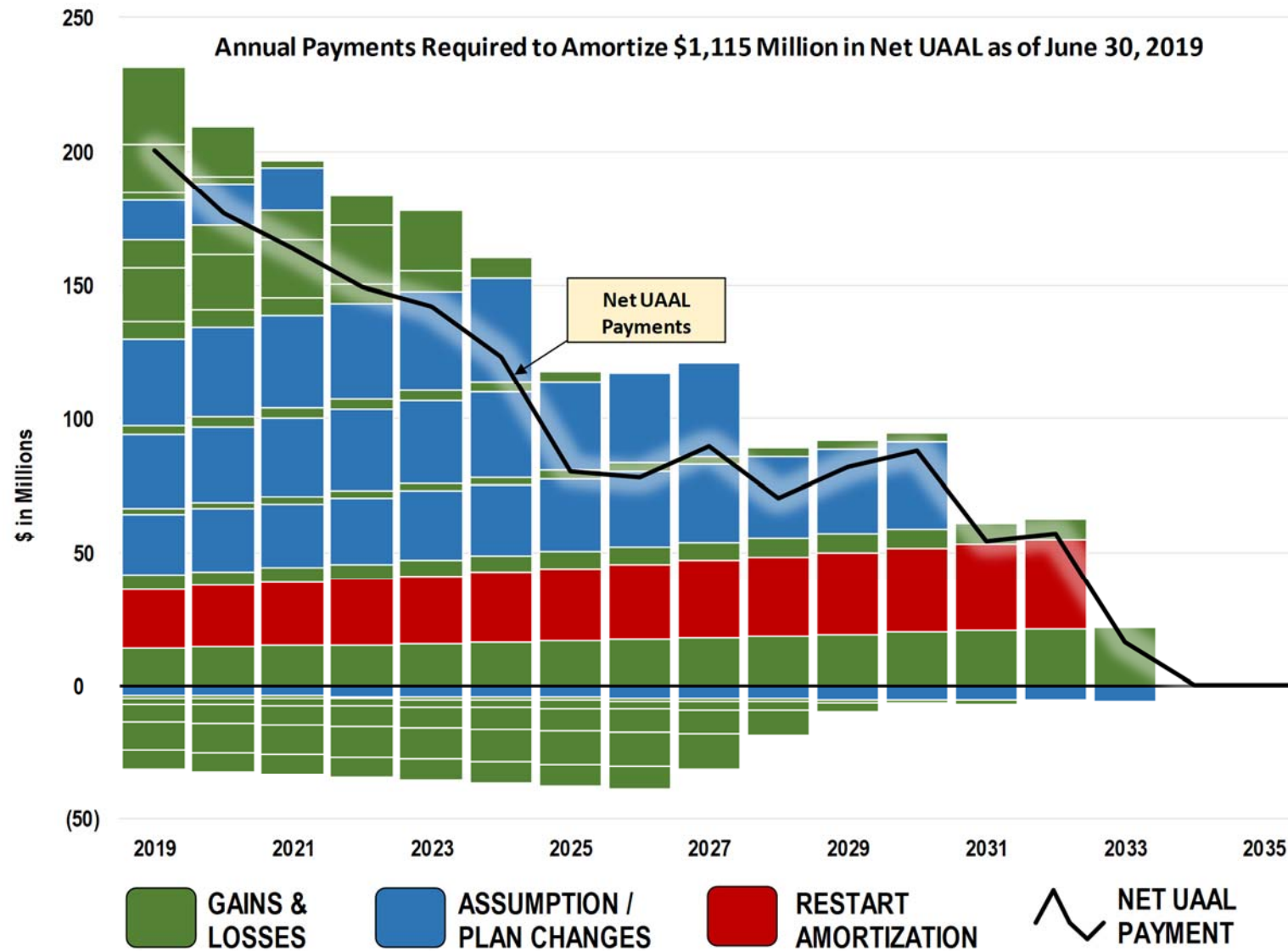
<sup>(2)</sup> The initial amounts are only available for periods based on prior audit and valuation results reviewed or prepared by Segal.

<sup>(3)</sup> This amount together with the \$2.4 million gain in footnote 1 equals to \$60.9 million gain, which is the total UAAL due to change in actuarial assumptions as shown on page 27.

## EXHIBIT I – PROJECTION OF UAAL BALANCES AND PAYMENTS



## EXHIBIT I – PROJECTION OF UAAL BALANCES AND PAYMENTS (CONTINUED)



## EXHIBIT J – DEFINITION OF PENSION TERMS

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

<b>Actuarial Accrued Liability for Actives:</b>	The equivalent of the accumulated Normal Costs allocated to the years before the valuation date.
<b>Actuarial Accrued Liability for Pensioners and Beneficiaries:</b>	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.
<b>Actuarial Cost Method:</b>	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.
<b>Actuarial Gain or Loss:</b>	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.
<b>Actuarially Equivalent:</b>	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
<b>Actuarial Present Value (APV):</b>	<p>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:</p> <p>Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)</p> <p>Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and</p> <p>Discounted according to an assumed rate (or rates) of return to reflect the time value of money.</p>

<b>Actuarial Present Value of Future Benefits:</b>	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.
<b>Actuarial Valuation:</b>	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.
<b>Actuarial Value of Assets (AVA):</b>	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.
<b>Actuarially Determined:</b>	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.
<b>Actuarially Determined Contribution (ADC):</b>	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.
<b>Amortization Method:</b>	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.
<b>Amortization Payment:</b>	The portion of the pension plan contribution, or ADC, that is intended to payoff the Unfunded Actuarial Accrued Liability.

<b>Assumptions or Actuarial Assumptions:</b>	<p>The estimates upon which the cost of the Plan is calculated, including:</p> <p><u>Investment return</u> - the rate of investment yield that the Plan will earn over the long-term future;</p> <p><u>Mortality rates</u> - the rate or probability of death at a given age for employees and pensioners;</p> <p><u>Retirement rates</u> - the rate or probability of retirement at a given age or service;</p> <p><u>Disability rates</u> – the rate or probability of disability retirement at a given age;</p> <p><u>Termination rates</u> - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement;</p> <p><u>Salary increase rates</u> - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.</p>
<b>Closed Amortization Period:</b>	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.
<b>Decrements:</b>	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.
<b>Defined Benefit Plan:</b>	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
<b>Defined Contribution Plan:</b>	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.
<b>Experience Study:</b>	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.
<b>Funded Ratio:</b>	The ratio of the Valuation Value of Assets (VVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the VVA.
<b>Investment Return:</b>	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.
<b>Normal Cost:</b>	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.

<b>Open Amortization Period:</b>	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.
<b>Payroll or Compensation:</b>	Compensation Earnable and Pensionable Compensation expected to be paid to active members during the twelve months following the valuation date. Only Compensation Earnable and Pensionable Compensation that would possibly go into the determination of retirement benefits are included.
<b>Unfunded Actuarial Accrued Liability:</b>	The excess of the Actuarial Accrued Liability over the Valuation 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.
<b>Valuation Date or Actuarial Valuation Date:</b>	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.
<b>Valuation Value of Assets:</b>	The Actuarial Value of Assets reduced by the value of non-valuation reserves.

## Section 4: Actuarial Valuation Basis

## EXHIBIT I – ACTUARIAL ASSUMPTIONS AND METHODS

<b>Rationale for Assumptions</b>	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the July 1, 2015 through June 30, 2018 Actuarial Experience Study dated April 9, 2019. Unless otherwise noted, all actuarial assumptions and methods shown below apply to members for all tiers. These assumptions were adopted by the Board.																										
<b><u>Economic Assumptions</u></b>																											
<b>Net Investment Return:</b>	7.00%; net of investment expenses. Based on the Actuarial Experience Study reference above, expected investment expenses represent about 0.60% of the Actuarial Value of Assets.																										
<b>Administrative Expenses:</b>	<p>1.20% of payroll allocated to both the employer and member based on the components of the total average contribution rate (before expenses) for the employer and member. This results in an administrative expense load as shown below:</p> <table><tr><th colspan="2">Average Contribution Rate Before Administrative Expense</th><th>Weighting</th><th>Total Loading</th></tr><tr><td>Employer</td><td>59.80%</td><td>86.89%</td><td>1.04%</td></tr><tr><td>Member</td><td>9.02%</td><td>13.11%</td><td>0.16%</td></tr><tr><td>Total</td><td></td><td>100.00%</td><td>1.20%</td></tr></table> <p>Under this approach, the employer Normal Cost rate is then increased by the same percent of payroll as the member rate with the remaining employer loading allocated to the employer UAAL rate. This is done to maintain a 50/50 sharing of Normal Cost for those in Tier 5. The table below shows this allocation.</p> <table><tr><th colspan="2">Allocation of Administrative Expense Load as a % of Payroll</th></tr><tr><td>Addition to Employer Basic Normal Cost Rate</td><td>0.16%</td></tr><tr><td>Addition to Employer Basic UAAL Rate</td><td>0.88%</td></tr><tr><td>Addition to Member Basic Rate</td><td>0.16%</td></tr><tr><td>Total Addition to Contribution Rates</td><td>1.20%</td></tr></table> <p>The administrative expense load is added to the Basic Regular rates for employers and members.</p>	Average Contribution Rate Before Administrative Expense		Weighting	Total Loading	Employer	59.80%	86.89%	1.04%	Member	9.02%	13.11%	0.16%	Total		100.00%	1.20%	Allocation of Administrative Expense Load as a % of Payroll		Addition to Employer Basic Normal Cost Rate	0.16%	Addition to Employer Basic UAAL Rate	0.88%	Addition to Member Basic Rate	0.16%	Total Addition to Contribution Rates	1.20%
Average Contribution Rate Before Administrative Expense		Weighting	Total Loading																								
Employer	59.80%	86.89%	1.04%																								
Member	9.02%	13.11%	0.16%																								
Total		100.00%	1.20%																								
Allocation of Administrative Expense Load as a % of Payroll																											
Addition to Employer Basic Normal Cost Rate	0.16%																										
Addition to Employer Basic UAAL Rate	0.88%																										
Addition to Member Basic Rate	0.16%																										
Total Addition to Contribution Rates	1.20%																										
<b>Member Contribution Crediting Rate:</b>	2.75%, compounded semi-annually. (The difference between the 7.00% net investment return assumption and 2.75% is credited to the other valuation reserves.)																										

<b>Consumer Price Index:</b>	<p>Increase of 2.75% per year, retiree COLA increases due to CPI subject to a 3.00% maximum change per year for General Tiers 1, 2 and 3, and Safety Tiers 1 and 2. General and Safety Tiers 4 and 5 receive no COLA increases.</p> <p>For member that have COLA banks, we have reflected those amounts in projecting their future COLAs.</p>																																									
<b>Payroll Growth:</b>	Inflation of 2.75% per year plus “across the board” real salary increases of 0.50% per year.																																									
<b>Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:</b>	Increase of 2.75% per year from the valuation date.																																									
<b>Increase in Section 7522.10 Compensation Limit:</b>	Increase of 2.75% per year from the valuation date.																																									
<b>Salary Increases:</b>	<p>The annual rate of compensation increase includes: inflation at 2.75%, plus “across the board” salary increases of 0.50% per year, plus the following merit and promotion increases:</p> <table><tr><th colspan="3">Merit and Promotion Increases</th></tr><tr><th rowspan="2">Years of Service</th><th colspan="2">Rate (%)</th></tr><tr><th>General</th><th>Safety</th></tr><tr><td>Less than 1</td><td>8.50</td><td>8.50</td></tr><tr><td>1-2</td><td>7.50</td><td>7.75</td></tr><tr><td>2-3</td><td>6.50</td><td>6.50</td></tr><tr><td>3-4</td><td>5.25</td><td>5.50</td></tr><tr><td>4-5</td><td>4.75</td><td>4.75</td></tr><tr><td>5-6</td><td>3.75</td><td>3.75</td></tr><tr><td>6-7</td><td>3.00</td><td>3.50</td></tr><tr><td>7-8</td><td>2.00</td><td>2.50</td></tr><tr><td>8-9</td><td>1.50</td><td>1.70</td></tr><tr><td>9-10</td><td>1.25</td><td>1.60</td></tr><tr><td>10 &amp; Over</td><td>1.10</td><td>1.50</td></tr></table>	Merit and Promotion Increases			Years of Service	Rate (%)		General	Safety	Less than 1	8.50	8.50	1-2	7.50	7.75	2-3	6.50	6.50	3-4	5.25	5.50	4-5	4.75	4.75	5-6	3.75	3.75	6-7	3.00	3.50	7-8	2.00	2.50	8-9	1.50	1.70	9-10	1.25	1.60	10 & Over	1.10	1.50
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## Demographic Assumptions

### Post-Retirement Mortality Rates:

#### *Healthy*

- **General Members and All Beneficiaries:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) times 110%, projected generationally with the two-dimensional mortality improvement scale MP-2018.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2018.

#### *Disabled*

- **General Members:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2018.
- **Safety Members:** Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2018.

The Pub-2010 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. These mortality tables were adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

**Pre-Retirement Mortality Rates:**

- **General Members:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2018.
- **Safety Members:** Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2018

Age	Rate (%)			
	General <sup>(1)</sup>		Safety <sup>(1)</sup>	
	Male	Female	Male	Female
25	0.02	0.01	0.03	0.02
30	0.03	0.01	0.04	0.02
35	0.04	0.02	0.04	0.03
40	0.06	0.03	0.05	0.04
45	0.09	0.05	0.07	0.06
50	0.13	0.08	0.10	0.08
55	0.19	0.11	0.15	0.11
60	0.28	0.17	0.23	0.14
65	0.41	0.27	0.35	0.20
70	0.61	0.44	0.66	0.39

All pre-retirement deaths are assumed to be non-service connected.

<sup>(1)</sup> Generational projections beyond the base year (2010) are not reflected in the above mortality rates.

**Mortality Rates for Member Contributions:**

- **General Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) times 110%, projected 30 years with the two-dimensional mortality improvement scale MP-2018, weighted 35% male and 65% female.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected 30 years with the two-dimensional mortality improvement scale MP-2018, weighted 80% male and 20% female.

Disability Incidence Rates:	Disability Incidence		
	Rate (%)		
	Age	General	Safety
	20	0.01	0.05
	25	0.01	0.11
	30	0.02	0.24
	35	0.04	0.42
	40	0.11	0.65
	45	0.21	0.90
	50	0.28	1.30
	55	0.33	1.80
	60	0.44	2.60
	65	0.65	3.00
	70	0.75	3.00
50% of General disabilities are assumed to be service connected disabilities (duty) and the other 50% are assumed to be non-service connected (ordinary) disabilities.			
100% of Safety disabilities are assumed to be service connected (duty) disabilities.			

**Termination Rates:**

Termination		
Years of Service	Rate (%)	
	General	Safety
Less than 1	18.00	13.00
1-2	11.00	8.00
2-3	9.00	7.00
3-4	8.00	4.00
4-5	7.50	3.50
5-6	6.00	3.25
6-7	5.50	3.00
7-8	5.00	2.75
8-9	4.75	2.50
9-10	4.00	2.25
10-11	4.00	2.00
11-12	4.00	1.90
12-13	3.75	1.80
13-14	3.75	1.70
14-15	3.75	1.60
15-16	3.50	1.50
16-17	2.75	1.40
17-18	2.75	1.30
18-19	2.75	1.20
19-20	2.50	1.10
20 & Over	2.25	1.00

Proportion of Total Termination Assumed to Receive Refunds and Deferred Vested Benefits		
Years of Service	Rate (%)	
	General	Safety
0-4	50.00	50.00
5-9	30.00	70.00
10-14	25.00	75.00
15-19	15.00	85.00
20 & Over	10.00	90.00

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

Retirement Rates:	Retirement Rates (%)						
	Age	General Tier 1 (Less than 30 Years of Service)	General Tier 1 (30 or More Years of Service)	General Tier 2	General Tier 3	General Tier 4	General Tier 5
	50	5.00	15.00	3.00	3.60	2.00	0.00
	51	3.75	11.25	3.00	3.60	2.00	0.00
	52	3.50	10.50	3.60	4.20	2.50	4.50
	53	3.50	10.50	3.60	4.20	2.50	2.00
	54	5.00	15.00	4.20	5.00	3.00	2.50
	55	8.00	16.00	8.40	10.00	4.00	3.50
	56	10.00	20.00	10.00	12.00	5.00	4.50
	57	13.00	26.00	10.00	12.00	6.00	5.50
	58	14.00	28.00	10.00	12.00	7.00	6.50
	59	15.00	30.00	10.00	14.00	8.00	7.50
	60	16.00	24.00	15.00	16.00	9.00	8.50
	61	18.00	27.00	15.00	16.00	10.00	9.50
	62	26.50	31.50	25.00	30.00	16.00	15.00
	63	21.00	31.50	24.00	22.00	16.00	15.00
	64	25.00	37.50	24.00	22.00	19.00	18.00
	65	40.00	60.00	35.00	35.00	23.00	22.00
	66	40.00	60.00	34.00	30.00	20.00	20.00
	67	40.00	60.00	34.00	30.00	20.00	20.00
	68	35.00	52.50	35.00	35.00	25.00	25.00
	69	35.00	52.50	35.00	40.00	30.00	30.00
	70	35.00	52.50	70.00	60.00	60.00	60.00
	71	50.00	75.00	70.00	60.00	60.00	60.00
	72	50.00	75.00	70.00	60.00	60.00	60.00
	73	50.00	75.00	70.00	60.00	60.00	60.00
	74	50.00	75.00	70.00	60.00	60.00	60.00
	75 & Over	100.00	100.00	100.00	100.00	100.00	100.00

Retirement Rates (continued):	Retirement Rates (%)			
	Age	Safety Tiers 1 & 2	Safety Tier 4	Safety Tier 5
	45	10.00	1.00	0.00
	46	2.00	1.00	0.00
	47	2.00	1.00	0.00
	48	2.00	1.00	0.00
	49	3.00	2.00	0.00
	50	5.00	4.00	4.00
	51	6.00	4.00	4.00
	52	10.00	5.00	5.00
	53	12.00	6.00	6.00
	54	30.00	11.00	11.00
	55	40.00	18.00	18.00
	56	25.00	18.00	18.00
	57	25.00	20.00	22.00
	58	20.00	20.00	20.00
	59	20.00	23.00	23.00
	60	30.00	40.00	40.00
	61	30.00	40.00	40.00
	62	35.00	40.00	40.00
	63	35.00	40.00	40.00
	64	35.00	40.00	40.00
	65 & Over	100.00	100.00	100.00
	Retirement rate for Safety Tier 1 and Safety Tier 2 is 100% after a member accrues a benefit of 100% of final average earnings.			
Retirement Age and Benefit for Deferred Vested Members:	For current and future deferred vested members, retirement assumptions are as follows:			
	General Retirement Age: 59 Safety Retirement Age: 54  20% of future General and 30% of future Safety deferred vested members terminated with less than five years of service will continue to work for a reciprocal employer. For those future deferred vested members terminated with five or more years of service, 30% of General and 50% of Safety will continue to work for a reciprocal employer.  For reciprocals, 4.35% and 4.75% compensation increases are assumed per annum for General and Safety, respectively.			

<b>Future Benefit Accruals:</b>	1.0 year of service per year of employment.
<b>Unknown Data for Members:</b>	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
<b>Definition of Active Members:</b>	First day of pay period following employment.
<b>Form of Payment:</b>	All active and inactive members are assumed to elect the unmodified option at retirement.
<b>Percent Married:</b>	For all active and inactive members, 70% of male members and 50% of female members are assumed to be married at pre-retirement death or retirement.
<b>Age and Gender of Spouse:</b>	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.
<b>Annual Leave Conversion:</b>	<p>Eligibility for annual leave plans is determined based on hire date along with other factors. The following assumptions for the amount of service converted from unused annual leave at retirement are used:</p> <p><u>New Annual Leave Plan:</u> 40 hours per year of service.</p> <p><u>Annual Leave Plan II:</u> 25 hours per year of service.</p> <p><u>Vacation/Sick Leave Plans:</u> 35 hours per year of service for General and 45 hours per year of service for Safety.</p> <p><u>Annual Leave IV Plan or the Old Annual Leave Plan:</u> Based on actual hours in a member's frozen time off bank.</p>

<b><u>Actuarial Funding Policy</u></b>	
<b>Actuarial Cost Method:</b>	Entry Age Actuarial Cost Method. Entry Age is the age at the member's hire date. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation, with Normal Cost determined as if the current benefit formula for each individual has always been in effect (i.e., "replacement life within a tier").
<b>Actuarial Value of Assets:</b>	Market value of assets (MVA) less unrecognized returns in each of the last nine semi-annual accounting periods. Unrecognized returns are equal to the difference between the actual market return and the expected return on the market value, and are recognized semi-annually over a five-year period. The actuarial value of assets is further adjusted, if necessary, to be within 30% of the market value of assets.
<b>Valuation Value of Assets:</b>	The actuarial value of assets, reduced by the value of the non-valuation reserves.
<b>Amortization Policy:</b>	<p>The UAAL, (i.e., the difference between the Actuarial Accrued Liability and the Valuation Value of Assets), as of June 30, 2003 valuation is being amortized over a declining period with 14 years remaining as of June 30, 2019.</p> <p>Any new UAAL as a result of assumption changes, method changes and actuarial gains or losses identified in the annual valuation as of June 30, 2011 and later will be amortized over a period of 15 years.</p> <p>Any new UAAL as a result of plan amendments will be amortized over a period of 15 years.</p> <p>Any new UAAL as a result of Golden Handshakes or Early Retirement Incentive Programs (ERIP) will be amortized over a period of up to 5 years.</p> <p>The UAAL shall be amortized over "closed" amortization periods so that the amortization period for each layer decreases by one year with each actuarial valuation.</p> <p>The UAAL shall be amortized as a level percentage of payroll so that the amortization amount in each year during the amortization period shall be expected to be a level percentage of covered payroll, taking into consideration the current assumption for general payroll increase.</p> <p>If the AAL is overfunded (i.e., the Valuation Value of Assets exceeds 120% of the Actuarial Accrued Liability so that there is a surplus), such surplus and any subsequent surpluses will be amortized over an "open" amortization period of 30 years. Any prior UAAL amortization layers will be considered fully amortized, and any subsequent UAAL, will be amortized over 15 years as the first of a new series of amortization layers.</p>

<b><u>Other Actuarial Methods</u></b>	
<b>Employer Contributions:</b>	<p>Employer contributions consist of two components:</p> <p><i>Normal Cost</i></p> <p>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 determined as a level percentage of the member's compensation.</p> <p><i>Contribution to the Unfunded Actuarial Accrued Liability (UAAL)</i></p> <p>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 Association) 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., 2.75% inflation plus 0.50% "across the board" salary increase).</p> <p>The amortization policy is described on the previous page.</p> <p>The recommended employer contributions are provided in <i>Section 2, Subsection F</i>.</p>
<b>Member Contributions:</b>	<p><b>Non-Tier 5 Members (i.e., Non-CalPEPRA)</b></p> <p>Articles 6 and 6.8 of the 1937 Act define the methodology to be used in the calculation of member basic contribution rates for non-Tier 5 General members and Safety members, respectively. The basic contribution rate is determined so that the accumulation of a member's basic contributions made in a given year until a certain age will be sufficient to fund an annuity at that age that is equal to:</p> <ul style="list-style-type: none"> <li>➤ 1/200 of One-Year Average Final Compensation at age 60 for General Tier 1</li> <li>➤ 1/240 of One-Year Average Final Compensation at age 60 for General Tier 2</li> <li>➤ 1/200 of Three-Year Average Final Compensation at age 55 for General Tier 3</li> <li>➤ 1/120 of Three-Year Average Final Compensation at age 60 for General Tier 4</li> <li>➤ 1/200 of One-Year Average Final Compensation at age 50 for Safety Tiers 1 and 2</li> <li>➤ 1/100 of Three-Year Average Final Compensation at age 50 for Safety Tier 4</li> </ul> <p>In addition, as a result of the Settlement Agreement, General Tier 1 and Safety Tier 1 members are required to make additional basic contributions in order to receive the Settlement Benefit. The total basic Regular plus Settlement rate is:</p> <ul style="list-style-type: none"> <li>➤ 1/160 of One-Year Average Final Compensation at age 55 for General Tier 1</li> <li>➤ 1/160 of One-Year Average Final Compensation at age 50 for Safety Tier 1</li> </ul>

	<p>It is assumed that contributions are made annually at the same rate, starting at entry age. In addition to their basic contributions, members in Tiers 1, 2 and 3 pay one-half of the total normal cost necessary to fund their cost-of-living benefits. There are no cost-of-living benefits provided in General and Safety Tiers 4. Accumulation includes semi-annual crediting of interest at the assumed investment earning rate.</p> <p><b>Tier 5 Members (i.e., CalPEPRA)</b></p> <p>Pursuant to Section 7522.30(a) of the Government Code, General and Safety Tiers 5 members are required to contribute at least 50% of the Normal Cost rate. 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 Tier 5 members and we have not taken into account the requirements of Section 7522.30(e).</p> <p>The member contribution rates for all members are provided in <i>Section 4, Exhibit III</i>.</p>
<b>Internal Revenue Code Section 415:</b>	<p>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.</p> <p>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.</p> <p>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 \$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.</p> <p>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).</p> <p>Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard.</p> <p>Non-CalPEPRA contribution rates determined in this valuation have not been reduced for the Section 415 limitations for active and inactive vested members. Actual limitations will result in gains as they occur.</p>
<b>Changed Actuarial Assumptions:</b>	<p>The following assumptions have been changed since the prior valuation. Rationale for these changes are presented in the July 1, 2015 through June 30, 2018 Actuarial Experience Study:</p>
<i>Administrative Expenses:</i>	<p>1.10% of payroll allocated to both the employer and member based on the components of the total average contribution rate (before expenses) for the employer and member.</p>
<i>Member Contribution Crediting Rate:</i>	<p>3.00%, compounded semi-annually. (The difference between the 7.00% net investment return assumption and 3.00% is credited to the other valuation reserves.)</p>

<b>Changed Actuarial Assumptions (continued):</b>	The following assumptions have been changed since the prior valuation. Rationale for these changes are presented in the July 1, 2015 through June 30, 2018 Actuarial Experience Study:																																					
<i>Consumer Price Index:</i>	Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 3.00% maximum change per year for General Tiers 1, 2 and 3, and Safety Tiers 1 and 2. General and Safety Tiers 4 and 5 receive no COLA increases.																																					
<i>Payroll Growth:</i>	Inflation of 3.00% per year plus “across the board” real salary increases of 0.50% per year.																																					
<i>Increase in Section 7522.10 Compensation Limit:</i>	Increase of 3.00% per year from the valuation date.																																					
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<b>Changed Actuarial Assumptions (continued):</b>	The following assumptions have been changed since the prior valuation. Rationale for these changes are presented in the July 1, 2015 through June 30, 2018 Actuarial Experience Study:																																																												
<i>Post-Retirement Mortality Rates:</i>	<i>Healthy</i> <ul style="list-style-type: none"><li>• <b>General Members and All Beneficiaries:</b> Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015, set forward one year for females.</li><li>• <b>Safety Members:</b> Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015, set back two years.</li></ul> <i>Disabled</i> <ul style="list-style-type: none"><li>• <b>General Members:</b> Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015, set forward eight years.</li><li>• <b>Safety Members:</b> Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015, set forward seven years.</li></ul>																																																												
<i>Pre-Retirement Mortality Rates:</i>	<ul style="list-style-type: none"><li>• <b>General and Safety Members:</b> Headcount-Weighted RP-2014 Employee Mortality Table projected 20 years with the two-dimensional scale MP2015 times 75%.</li></ul> <table><tr><th></th><th colspan="4">Rate (%)</th></tr><tr><th></th><th colspan="2">General</th><th colspan="2">Safety</th></tr><tr><th>Age</th><th>Male</th><th>Female</th><th>Male</th><th>Female</th></tr><tr><td>25</td><td>0.03</td><td>0.01</td><td>0.03</td><td>0.01</td></tr><tr><td>30</td><td>0.03</td><td>0.02</td><td>0.03</td><td>0.02</td></tr><tr><td>35</td><td>0.04</td><td>0.02</td><td>0.04</td><td>0.02</td></tr><tr><td>40</td><td>0.04</td><td>0.03</td><td>0.04</td><td>0.03</td></tr><tr><td>45</td><td>0.07</td><td>0.05</td><td>0.07</td><td>0.05</td></tr><tr><td>50</td><td>0.11</td><td>0.08</td><td>0.11</td><td>0.08</td></tr><tr><td>55</td><td>0.20</td><td>0.13</td><td>0.20</td><td>0.13</td></tr><tr><td>60</td><td>0.35</td><td>0.19</td><td>0.35</td><td>0.19</td></tr><tr><td>65</td><td>0.60</td><td>0.27</td><td>0.60</td><td>0.27</td></tr></table> <p>All pre-retirement deaths are assumed to be non-service connected.</p>		Rate (%)					General		Safety		Age	Male	Female	Male	Female	25	0.03	0.01	0.03	0.01	30	0.03	0.02	0.03	0.02	35	0.04	0.02	0.04	0.02	40	0.04	0.03	0.04	0.03	45	0.07	0.05	0.07	0.05	50	0.11	0.08	0.11	0.08	55	0.20	0.13	0.20	0.13	60	0.35	0.19	0.35	0.19	65	0.60	0.27	0.60	0.27
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Changed Actuarial Assumptions (continued):	The following assumptions have been changed since the prior valuation. Rationale for these changes are presented in the July 1, 2015 through June 30, 2018 Actuarial Experience Study:																																																											
Mortality Rates for Member Contributions:	<ul style="list-style-type: none"><li>• <b>General Members:</b> Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015, set forward one year for females, weighted 35% male and 65% female.</li><li>• <b>Safety Members:</b> Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015, set back two years weighted, 80% male and 20% female.</li></ul>																																																											
Disability Incidence Rates:		<table><tr><th colspan="4">Disability Incidence</th></tr><tr><th colspan="4">Rate (%)</th></tr><tr><th>Age</th><th>General Male</th><th>General Female</th><th>Safety Male and Female</th></tr><tr><td>20</td><td>0.01</td><td>0.01</td><td>0.05</td></tr><tr><td>25</td><td>0.01</td><td>0.02</td><td>0.11</td></tr><tr><td>30</td><td>0.02</td><td>0.02</td><td>0.24</td></tr><tr><td>35</td><td>0.04</td><td>0.06</td><td>0.42</td></tr><tr><td>40</td><td>0.12</td><td>0.10</td><td>0.56</td></tr><tr><td>45</td><td>0.21</td><td>0.14</td><td>0.66</td></tr><tr><td>50</td><td>0.25</td><td>0.17</td><td>0.76</td></tr><tr><td>55</td><td>0.31</td><td>0.24</td><td>1.52</td></tr><tr><td>60</td><td>0.68</td><td>0.33</td><td>3.20</td></tr><tr><td>65</td><td>0.96</td><td>0.59</td><td>4.00</td></tr><tr><td>70</td><td>1.00</td><td>0.90</td><td>4.00</td></tr></table>			Disability Incidence				Rate (%)				Age	General Male	General Female	Safety Male and Female	20	0.01	0.01	0.05	25	0.01	0.02	0.11	30	0.02	0.02	0.24	35	0.04	0.06	0.42	40	0.12	0.10	0.56	45	0.21	0.14	0.66	50	0.25	0.17	0.76	55	0.31	0.24	1.52	60	0.68	0.33	3.20	65	0.96	0.59	4.00	70	1.00	0.90	4.00
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	50% of General disabilities are assumed to be service connected (duty) disabilities and the other 50% are assumed to be non-service connected (ordinary) disabilities.																																																											
	100% of Safety disabilities are assumed to be service connected (duty) disabilities.																																																											

**Changed Actuarial Assumptions (continued):**

The following assumptions have been changed since the prior valuation. Rationale for these changes are presented in the July 1, 2015 through June 30, 2018 Actuarial Experience Study:

*Termination Rates:*

Termination (< 5 Years of Service)		
Years of Service	Rate (%)	
	General	Safety
Less than 1	17.00	14.00
1 – 2	9.50	7.50
2 – 3	8.00	6.00
3 – 4	7.00	5.00
4 – 5	6.75	4.75

Termination (5+ Years of Service)		
Age	Rate (%)	
	General	Safety
20	5.75	3.50
25	5.75	3.50
30	5.30	2.90
35	4.55	2.20
40	3.92	1.85
45	3.58	1.60
50	3.44	1.50
55	3.31	1.50
60	3.10	0.60
65	3.00	0.00
70	1.20	0.00

Proportion of Total Termination Assumed to Receive Refunds and Deferred Vested Benefits (%)		
Years of Service	Refunds	Deferred Vested Benefits
0 – 4	60.00	40.00
5 – 2	30.00	70.00
10 – 3	25.00	75.00
15 – 4	15.00	85.00
20 & Over	10.00	90.00

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

**Changed Actuarial Assumptions (continued):**

The following assumptions have been changed since the prior valuation. Rationale for these changes are presented in the July 1, 2015 through June 30, 2018 Actuarial Experience Study:

*Retirement Rates:*

Age	Retirement Rates (%)					
	General Tier 1 Male	General Tier 1 Female	General Tier 2	General Tier 3	General Tier 4	General Tier 5
50	5.00	4.00	3.00	2.40	2.00	0.00
51	3.50	4.00	3.00	2.40	2.00	0.00
52	3.00	4.00	3.60	2.80	2.50	4.50
53	4.00	4.00	3.60	2.80	2.50	2.00
54	4.00	6.00	4.20	3.40	3.00	2.50
55	8.00	9.00	8.40	6.70	4.00	3.50
56	9.00	11.00	10.00	8.00	5.00	4.50
57	14.00	14.00	10.00	8.00	6.00	5.50
58	15.00	15.00	10.00	8.00	7.00	6.50
59	16.00	16.00	10.00	12.00	8.00	7.50
60	25.00	20.00	15.00	15.40	9.00	8.50
61	20.00	22.00	15.00	15.40	10.00	9.50
62	25.00	28.00	25.00	27.40	16.00	15.00
63	25.00	22.00	24.00	19.00	16.00	15.00
64	25.00	25.00	24.00	19.00	19.00	18.00
65	45.00	35.00	35.00	34.60	23.00	22.00
66	40.00	35.00	34.00	26.60	20.00	20.00
67	40.00	35.00	34.00	26.60	20.00	20.00
68	40.00	45.00	35.00	32.00	25.00	25.00
69	50.00	45.00	35.00	37.00	30.00	30.00
70	50.00	50.00	70.00	60.00	60.00	60.00
71	50.00	50.00	70.00	60.00	60.00	60.00
72	50.00	50.00	70.00	60.00	60.00	60.00
73	50.00	50.00	70.00	60.00	60.00	60.00
74	50.00	50.00	70.00	60.00	60.00	60.00
75 & Over	100.00	100.00	100.00	100.00	100.00	100.00

**Changed Actuarial Assumptions (continued):**

The following assumptions have been changed since the prior valuation. Rationale for these changes are presented in the July 1, 2015 through June 30, 2018 Actuarial Experience Study:

*Retirement Rates (continued):*

Age	Retirement Rates (%)		
	Safety Tiers 1 & 2	Safety Tier 4	Safety Tier 5
45	1.00	1.00	0.00
46	1.00	1.00	0.00
47	1.00	1.00	0.00
48	1.00	1.00	0.00
49	3.00	2.00	0.00
50	5.00	4.00	4.00
51	7.00	4.00	4.00
52	8.00	5.00	5.00
53	14.00	6.00	6.00
54	27.00	11.00	11.00
55	40.00	20.00	20.00
56	25.00	20.00	20.00
57	25.00	20.00	25.00
58	20.00	20.00	20.00
59	20.00	23.00	23.00
60	40.00	45.00	45.00
61	40.00	45.00	45.00
62	50.00	45.00	45.00
63	50.00	45.00	45.00
64	50.00	45.00	45.00
65 & Over	100.00	100.00	100.00

<b>Changed Actuarial Assumptions (continued):</b>	The following assumptions have been changed since the prior valuation. Rationale for these changes are presented in the July 1, 2015 through June 30, 2018 Actuarial Experience Study:
<i>Retirement Age and Benefit for Deferred Vested Members</i>	<p>For current and future deferred vested members, retirement assumptions are as follows:</p> <p>General Retirement Age: 58</p> <p>Safety Retirement Age: 54</p> <p>20% of future General and 30% of future Safety deferred vested members terminated with less than five years of service will continue to work for a reciprocal employer. For those future deferred vested members terminated with five or more years of service, 35% of General and 55% of Safety will continue to work for a reciprocal employer.</p> <p>For reciprocals, 4.50% and 4.90% compensation increases are assumed per annum for General and Safety, respectively.</p>
<i>Percent Married:</i>	For all active and inactive members, 75% of male members and 50% of female members are assumed to be married at pre-retirement death or retirement.
<i>Annual Leave Conversion:</i>	<p>Eligibility for annual leave plans is determined based on hire date along with other factors. The following assumptions for the amount of service converted from unused annual leave at retirement are used:</p> <p><u>New Annual Leave Plan:</u> 35 hours per year of service.</p> <p><u>Annual Leave Plan II:</u> 25 hours per year of service.</p> <p><u>Vacation/Sick Leave Plans:</u> 35 hours per year of service for General and 40 hours per year of service for Safety.</p> <p><u>Annual Leave IV Plan or the Old Annual Leave Plan:</u> Based on actual hours in a member's frozen time off bank.</p>

## 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.

<b>Plan Year:</b>	July 1 through June 30
<b>Membership Eligibility:</b>	Membership with FCERA usually begins with the first day of the pay period following the date of appointment to a permanent position of at least 50% full-time.
<i>General and Safety Tier 1</i>	All General and Safety members hired on or before February 26, 2006 and General and Safety members of certain bargaining units hired after February 26, 2006.
<i>General and Safety Tier 2</i>	General and Safety members of certain bargaining units hired after February 26, 2006 and former Tier 1 members hired on or before February 26, 2006 who have elected to transfer to Tier 2.
<i>General Tier 3</i>	General members of certain bargaining units hired after December 17, 2007 and those eligible Tier 2 members hired on or before December 17, 2007.
<i>General and Safety Tier 4</i>	General and Safety County members hired on or after June 11, 2012 and prior to January 1, 2013.
<i>General and Safety Tier 5</i>	All General and Safety members hired on or after January 1, 2013.
<b>Final Compensation for Benefit Determination:</b>	
<i>General and Safety Tiers 1 &amp; 2</i>	Highest one-year average final compensation (\$31462.1) (FAS1).
<i>General Tiers 3 &amp; 4 and Safety Tier 4</i>	Highest three-year average final compensation (\$31462) (FAS3).
<i>General and Safety Tier 5</i>	Highest consecutive three years of pensionable compensation (\$7522.10(c), \$7522.32 and \$7522.34) (FAS3).
<b>Compensation Limit:</b>	
<i>General Tiers 1, 2, 3 &amp; 4 and Safety Tiers 1, 2 &amp; 4</i>	For members with membership dates on or after July 1, 1996, Compensation Earnable is limited to Internal Revenue Code Section 401(a)(17). The limit as of July 1, 2019 is \$280,000. The limit is indexed for inflation on an annual basis.
<i>General and Safety Tier 5</i>	Pensionable Compensation is limited to \$124,180 for 2019 (\$149,016, if not enrolled in Social Security). The limit is indexed for inflation on an annual basis.
<b>Service:</b>	Years of service (Yrs).

<b>Service Retirement Eligibility:</b>		
General 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).	
General Tier 5	Age 52 with 5 years of service (§7522.20(a)) or age 70 regardless of service (§31672.3).	
Safety Tiers 1, 2 & 4	Age 50 with 10 years of service, or age 70 regardless of service, or after 20 years regardless of age (§31663.25).	
Safety Tier 5	Age 50 with 5 years of service (§7522.25(d)) or age 70 regardless of service (§31672.3).	
<b>Benefit Formula:</b>		
General Tier 1	<b>Retirement Age</b>	<b>Benefit Formula</b>
Regular plus Settlement benefit pursuant to Ventura Settlement Agreement <sup>3</sup>	50	$(1.86\% \times \text{FAS1} - 1/3 \times 1.86\% \times \$350 \times 12) \times \text{Yrs}$
	55	$(2.50\% \times \text{FAS1} - 1/3 \times 2.50\% \times \$350 \times 12) \times \text{Yrs}$
	60 and over	$(3.27\% \times \text{FAS1} - 1/3 \times 3.27\% \times \$350 \times 12) \times \text{Yrs}$
General Tier 2 (§31676.16)	<b>Retirement Age</b>	<b>Benefit Formula</b>
	50	$(1.43\% \times \text{FAS1} - 1/3 \times 1.43\% \times \$350 \times 12) \times \text{Yrs}$
	55	$(2.00\% \times \text{FAS1} - 1/3 \times 2.00\% \times \$350 \times 12) \times \text{Yrs}$
	60	$(2.26\% \times \text{FAS1} - 1/3 \times 2.26\% \times \$350 \times 12) \times \text{Yrs}$
	62	$(2.37\% \times \text{FAS1} - 1/3 \times 2.37\% \times \$350 \times 12) \times \text{Yrs}$
	63 and over	$(2.42\% \times \text{FAS1} - 1/3 \times 2.42\% \times \$350 \times 12) \times \text{Yrs}$
General Tier 3 (§31676.15)	<b>Retirement Age</b>	<b>Benefit Formula</b>
	50	$(1.49\% \times \text{FAS3} - 1/3 \times 1.49\% \times \$350 \times 12) \times \text{Yrs}$
	55	$(2.00\% \times \text{FAS3} - 1/3 \times 2.00\% \times \$350 \times 12) \times \text{Yrs}$
	60	$(2.62\% \times \text{FAS3} - 1/3 \times 2.62\% \times \$350 \times 12) \times \text{Yrs}$
	62	$(2.82\% \times \text{FAS3} - 1/3 \times 2.82\% \times \$350 \times 12) \times \text{Yrs}$
	65 and over	$(3.13\% \times \text{FAS3} - 1/3 \times 3.13\% \times \$350 \times 12) \times \text{Yrs}$

<sup>3</sup> Please refer to the discussion on page 7 of this report for breakdown between Regular and Settlement benefits we use for determining contribution rate requirements for funding purposes.

<i>General Tier 4 (§31676.1)</i>	<b>Retirement Age</b>	<b>Benefit Formula</b>
	50	$(1.18\% \times \text{FAS3} - 1/3 \times 1.18\% \times \$350 \times 12) \times \text{Yrs}$
	55	$(1.49\% \times \text{FAS3} - 1/3 \times 1.49\% \times \$350 \times 12) \times \text{Yrs}$
	60	$(1.92\% \times \text{FAS3} - 1/3 \times 1.92\% \times \$350 \times 12) \times \text{Yrs}$
	62	$(2.09\% \times \text{FAS3} - 1/3 \times 2.09\% \times \$350 \times 12) \times \text{Yrs}$
<i>General Tier 5 (§7522.20(a))</i>	65 and over	$(2.43\% \times \text{FAS3} - 1/3 \times 2.43\% \times \$350 \times 12) \times \text{Yrs}$
	<b>Retirement Age</b>	<b>Benefit Formula</b>
	52	$1.00\% \times \text{FAS3} \times \text{Yrs}$
	55	$1.30\% \times \text{FAS3} \times \text{Yrs}$
	60	$1.80\% \times \text{FAS3} \times \text{Yrs}$
<i>Safety Tier 1 Regular plus Settlement benefit pursuant to Ventura Settlement Agreement<sup>4</sup></i>	62	$2.00\% \times \text{FAS3} \times \text{Yrs}$
	65	$2.30\% \times \text{FAS3} \times \text{Yrs}$
	67 and over	$2.50\% \times \text{FAS3} \times \text{Yrs}$
	<b>Retirement Age</b>	<b>Benefit Formula</b>
	50	$(2.50\% \times \text{FAS1} - 1/3 \times 2.50\% \times \$350 \times 12) \times \text{Yrs}$
<i>Safety Tier 2 (§31664.2)</i>	55 and over	$(3.27\% \times \text{FAS1} - 1/3 \times 3.27\% \times \$350 \times 12) \times \text{Yrs}$
	<b>Retirement Age</b>	<b>Benefit Formula</b>
	50	$(2.29\% \times \text{FAS1} - 1/3 \times 2.29\% \times \$350 \times 12) \times \text{Yrs}$
<i>Safety Tier 4 (§31664)</i>	55 and over	$(3.00\% \times \text{FAS1} - 1/3 \times 3.00\% \times \$350 \times 12) \times \text{Yrs}$
	<b>Retirement Age</b>	<b>Benefit Formula</b>
	50	$(2.00\% \times \text{FAS3} - 1/3 \times 2.00\% \times \$350 \times 12) \times \text{Yrs}$
	55 and over	$(2.62\% \times \text{FAS3} - 1/3 \times 2.62\% \times \$350 \times 12) \times \text{Yrs}$

<sup>4</sup> For funding purposes, contribution rate for Regular benefit is calculated pursuant under Section §31664 and the contribution rate for Settlement benefit is the difference between the benefit described above and the benefit under Section §31664.

<i>Safety Tier 5 (§7522.25(d))</i>	<b>Retirement Age</b>	<b>Benefit Formula</b>
	50	2.00% x FAS3 x Yrs
	55	2.50% x FAS3 x Yrs
	57 and over	2.70% x FAS3 x Yrs
<b>Maximum Benefit:</b>		
<i>General Tiers 1, 2, 3 &amp; 4 and Safety Tiers 1, 2 &amp; 4</i>		100% of Final Compensation (§31676.14, §31676.16, §31676.15, §31676.1, §31664 and §31664.2).
<i>General and Safety Tier 5</i>		There is no Final Compensation limit on the maximum retirement benefit.
<b>Ordinary Disability:<sup>5</sup></b>		
<i>General Tiers 1, 2, 4 &amp; 5</i>		
<i>Eligibility</i>		Five years of service (§31720).
<i>Benefit</i>		1.5% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 65, but the total benefit cannot be more than one-third of Final Compensation.
<i>General Tier 3</i>		
<i>Eligibility</i>		Five years of service (§31720).
<i>Benefit</i>		1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 65, but the total benefit cannot be more than one-third of Final Compensation.
<i>Safety Tiers 1, 2, 4 &amp; 5</i>		
<i>Eligibility</i>		Five years of service (§31720).
<i>Benefit</i>		1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 55, but the total benefit cannot be more than one-third of Final Compensation.
		For all members, 100% of the Service Retirement benefit will be paid, if greater.
<b>Line-of-Duty Disability:<sup>5</sup></b>		
<i>All Members</i>		

<sup>5</sup> For General and Safety Tier 1 members who retire because of disability, there is an allocation of the value of their disability benefits made by the Association's Pension Administration System between the "Regular" and "Settlement" benefits assuming those members would have been eligible to retire and collect a service retirement benefit. While it does not change the total contribution rates paid by each of the employer and the employee, consistent with the prior valuations we have continued in this valuation to adjust the allocation of the rates between "Regular" and "Settlement" benefits so as to be consistent with the allocation made by the Association's Pension Administration System.

<i>Eligibility</i>	No age or service requirements (§31720).
<i>Benefit</i>	50% of the Final Compensation or 100% of Service Retirement benefit, if greater (§31727.4).
<b>Pre-Retirement Death:</b>	
<i>All Members</i>	
<i>Eligibility</i>	None.
<i>Basic lump sum benefit</i>	Refund of member contributions with interest, plus one month's compensation for each year of service, to a maximum of six months' compensation (§31781).
<i>Death in line of duty</i>	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).
<i>Vested Members</i>	
<i>Eligibility</i>	Five years of service.
<i>Basic benefit</i>	60% of the greater of Service or Ordinary Disability Retirement benefit payable to surviving eligible spouse or eligible children (§31765.1, §31781.1), in lieu of the basic lump sum benefit above (§31781).
<i>Death in line of duty</i>	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).
<b>Death After Retirement:</b>	
<i>All Members</i>	
<i>Service Retirement or Ordinary Disability Retirement</i>	Unless another option was selected at retirement, 60% of member's unmodified allowance continued to eligible spouse (§31760.1). An eligible spouse is a surviving spouse who was married to the member at least one year prior to the day of retirement (§31760.1), or at least two years prior to the date of death, having attained age 55 on or prior to the date of death (§31786.1).
<i>Line-of-Duty Disability</i>	Unless another option was selected at retirement, 100% of member's unmodified allowance continued to eligible spouse (§31786).
<b>Withdrawal Benefits:</b>	
<i>Less than Five Years of Service</i>	Refund of accumulated employee contributions with interest, or earned 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).
<i>Five or More Years of Service</i>	If contributions left on deposit, a member is entitled to earned benefits commencing at any time after eligible to retire (§31700).

<b>Post-retirement Cost-of-Living Benefits:</b>	
<i>General Tiers 1, 2 &amp; 3 and Safety Tiers 1 &amp; 2</i>	Future changes based on changes to the Consumer Price Index for the West Region to a maximum of 3% per year, excess "banked" (\$31870.1).
<i>General Tiers 4 &amp; 5 and Safety Tiers 4 &amp; 5</i>	None.
<b>Pre-Retirement Death:</b>	
<i>General members</i>	
<i>New Annual Leave Plan (5Y)</i>	Members who entered the plan on or before October 10, 1983 and in bargaining groups who have agreed to this plan may convert hours in excess of 1,100 hours to service at retirement.
<i>Annual Leave Plan II (5Y)</i>	Members who entered the plan after October 10, 1983 with accruals in the 5Y leave plan and in bargaining groups who have agreed to this plan may convert hours in excess of 400 hours to service at retirement.
<i>Vacation/Sick Leave Plans (5Q, 5S and 5W)</i>	Members who entered the plan on or after December 14, 1998 and in bargaining groups who have agreed to these plans may convert all accrued sick leave hours to service at retirement.
<i>Annual Leave IV Plan or the Old Annual Leave Plan (5O)</i>	Members hired on or after October 10, 1983 or prior to that date, respectively, and who are in bargaining groups who have agreed to these plans, management or are unrepresented will convert any frozen hours balance to service at retirement.
<i>Safety members</i>	
<i>New Annual Leave Plan (5Y)</i>	Members who entered the plan on or before October 10, 1983 and in bargaining groups who have agreed to this plan may convert hours in excess of 1,100 hours to service at retirement.
<i>Annual Leave Plan II (5Y)</i>	Members who entered the plan after October 10, 1983 with accruals in the 5Y leave plan and in bargaining groups who have agreed to this plan may convert hours in excess of 400 hours to service at retirement.
<i>Vacation/Sick Leave Plans (5Q, 5S and 5W)</i>	Members who entered the plan on or after December 14, 1998 and in bargaining groups who have agreed to these plans may convert all accrued sick leave hours to service at retirement.
<i>Annual Leave IV Plan or the Old Annual Leave Plan (5O)</i>	Members hired on or after October 10, 1983 or prior to that date, respectively, and who are in bargaining groups who have agreed to these plans, management or are unrepresented will convert any frozen hours balance to service at retirement.

<b>Ventura Settlement Benefits:</b>	
<i>Section 6</i>	For Tier 1 members retiring on or after January 1, 2001 - The difference between the regular plus settlement benefits, and the regular benefit (i.e., \$31676.12 for General Tier 1 and \$31664 for Safety Tier 1).
<i>Section 8</i>	For Tier 1 members who retired prior to January 1, 2001 - \$15 per month per year of service, up to a maximum monthly benefit of \$450.
<i>Section 9</i>	All retired members (excluding General Tiers 4 & 5 and Safety Tier 5 members) are entitled to a \$3 per month per year of service benefit. Future increase in this benefit will depend on the amount of future undistributed earnings. For the purpose of this valuation, it is assumed that there will be no future increase in the amount of benefit.
<b>Member Contributions:</b>	
<i>General Tier 1</i>	
<i>Regular Basic</i>	Entry-age based rates that provide for an annuity at age 60 equal to 1/200 of FAS1 (§31621.5).
<i>Regular Plus Settlement Basic</i>	Entry-age based rates that provide for an annuity at age 55 equal to 1/160 of FAS1 (§31627).
<i>Cost-of-Living</i>	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
<i>General Tier 2</i>	
<i>Basic</i>	Entry-age based rates that provide for an annuity at age 60 equal to 1/240 of FAS1 (§31621.4).
<i>Cost-of-Living</i>	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
<i>General Tier 3</i>	
<i>Basic</i>	Entry-age based rates that provide for an annuity at age 55 equal to 1/200 of FAS3 (§31621.6 and §31630).
<i>Cost-of-Living</i>	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
<i>General Tier 4</i>	
<i>Basic</i>	Entry-age based rates that provide for an annuity at age 60 equal to 1/120 of FAS3 (§31621).
<i>Cost-of-Living</i>	None.
<i>Safety Tier 1</i>	
<i>Regular Basic</i>	Entry-age based rates that provide for an annuity at age 50 equal to 1/200 of FAS1 (§31639.5).
<i>Regular Plus Settlement Basic</i>	Entry-age based rates that provide for an annuity at age 50 equal to 1/160 of FAS1 (§31627).
<i>Cost-of-Living</i>	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
<i>Safety Tier 2</i>	
<i>Regular Basic</i>	Entry-age based rates that provide for an annuity at age 50 equal to 1/200 of FAS1 (§31639.5).

<i>Cost-of-Living Safety Tier 4</i>	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
<i>Regular Basic</i>	Entry-age based rates that provide for an annuity at age 50 equal to 1/100 of FAS3 (\$31639.25).
<i>Cost-of-Living</i>	None.
<i>General and Safety Tier 5</i>	Non-entry age based rates that provide for 50% of total Normal Cost Rate.
<b>Other Information:</b>	Non-Tier 5 Safety members with 30 or more years of service are exempt from paying member contributions. The same applies for General members hired on or before March 7, 1973.
<b>Changed Plan Provisions:</b>	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 Association should find the plan summary not in accordance with the actual provisions, the Association should alert Segal, to ensure the proper provisions are valued.

## EXHIBIT III – MEMBER CONTRIBUTION RATES

Comparison of Total Member Rate from June 30, 2019 (New) and June 30, 2018 (Current) Valuations

General Tier 1 <sup>(1)</sup>				General Tier 2 <sup>(1)</sup>			
Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change	Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change
25	9.17%	9.13%	<b>-0.04%</b>	25	6.18%	6.01%	<b>-0.17%</b>
35	10.53%	10.61%	<b>0.08%</b>	35	7.08%	6.97%	<b>-0.11%</b>
45	12.37%	12.66%	<b>0.29%</b>	45	8.18%	8.16%	<b>-0.02%</b>

General Tier 3 <sup>(1)</sup>				General Tier 4 <sup>(1)</sup>			
Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change	Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change
25	7.24%	7.18%	<b>-0.06%</b>	25	6.16%	6.21%	<b>0.05%</b>
35	8.33%	8.35%	<b>0.02%</b>	35	7.06%	7.19%	<b>0.13%</b>
45	9.76%	9.91%	<b>0.15%</b>	45	8.16%	8.42%	<b>0.26%</b>

General Tier 5			
Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change
All Ages <sup>(3)</sup>	7.17%	7.30%	<b>0.13%</b>

<sup>(1)</sup> For non-Tier 5 members, contributions for the first \$350 of monthly payroll are based on 2/3 (no adjustment for the administrative expense load) of the above rates.

<sup>(2)</sup> Includes an explicit administrative expense load of 0.16% of payroll that has been allocated to the Current and New member contribution rates.

<sup>(3)</sup> Tier 5 member rates are independent of entry age.

## EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Comparison of Total Member Rate from June 30, 2019 (New) and June 30, 2018 (Current) Valuations

Safety Tier 1 <sup>(1)</sup>				Safety Tier 2 <sup>(1)</sup>			
Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change	Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change
25	13.27%	12.67%	<b>-0.60%</b>	25	11.24%	10.95%	<b>-0.29%</b>
30	14.10%	13.53%	<b>-0.57%</b>	30	11.94%	11.69%	<b>-0.25%</b>
35	15.07%	14.52%	<b>-0.55%</b>	35	12.77%	12.54%	<b>-0.23%</b>

Safety Tier 4 <sup>(1)</sup>				Safety Tier 5			
Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change	Entry Age	Current <sup>(2)</sup>	New <sup>(2)</sup>	Change
25	9.83%	9.88%	<b>0.05%</b>	All Ages <sup>(3)</sup>	11.92%	11.96%	<b>0.04%</b>
30	10.45%	10.55%	<b>0.10%</b>				
35	11.16%	11.32%	<b>0.16%</b>				

<sup>(1)</sup> For non-Tier 5 members, contributions for the first \$350 of monthly payroll are based on 2/3 (no adjustment for the administrative expense load) of the above rates.

<sup>(2)</sup> Includes an explicit administrative expense load of 0.16% of payroll that has been allocated to the Current and New member contribution rates.

<sup>(3)</sup> Tier 5 member rates are independent of entry age.

## EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

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

General Tier 1										
Entry Age	Basic Regular		COLA Regular		Basic Settlement		COLA Settlement		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
15	2.36%	3.46%	1.55%	2.33%	0.93%	1.40%	0.53%	0.79%	5.37%	7.98%
16	2.36%	3.46%	1.55%	2.33%	0.93%	1.40%	0.53%	0.79%	5.37%	7.98%
17	2.40%	3.51%	1.58%	2.37%	0.95%	1.42%	0.53%	0.80%	5.46%	8.10%
18	2.43%	3.56%	1.60%	2.40%	0.97%	1.45%	0.55%	0.82%	5.55%	8.23%
19	2.46%	3.62%	1.63%	2.44%	0.97%	1.46%	0.55%	0.82%	5.61%	8.34%
20	2.50%	3.67%	1.65%	2.48%	0.99%	1.48%	0.56%	0.84%	5.70%	8.47%
21	2.53%	3.72%	1.68%	2.52%	1.01%	1.51%	0.57%	0.85%	5.79%	8.60%
22	2.57%	3.78%	1.70%	2.55%	1.02%	1.53%	0.57%	0.86%	5.86%	8.72%
23	2.61%	3.83%	1.73%	2.59%	1.04%	1.56%	0.59%	0.88%	5.97%	8.86%
24	2.64%	3.89%	1.75%	2.63%	1.05%	1.58%	0.59%	0.89%	6.03%	8.99%
25	2.68%	3.94%	1.78%	2.67%	1.07%	1.61%	0.61%	0.91%	6.14%	9.13%
26	2.72%	4.00%	1.81%	2.71%	1.09%	1.63%	0.61%	0.92%	6.23%	9.26%
27	2.76%	4.06%	1.83%	2.75%	1.10%	1.65%	0.62%	0.93%	6.31%	9.39%
28	2.80%	4.12%	1.87%	2.80%	1.12%	1.68%	0.63%	0.95%	6.42%	9.55%
29	2.84%	4.18%	1.89%	2.84%	1.13%	1.70%	0.64%	0.96%	6.50%	9.68%
30	2.88%	4.24%	1.92%	2.88%	1.15%	1.73%	0.65%	0.98%	6.60%	9.83%
31	2.92%	4.30%	1.95%	2.92%	1.17%	1.76%	0.66%	0.99%	6.70%	9.97%
32	2.96%	4.37%	1.98%	2.97%	1.19%	1.78%	0.67%	1.01%	6.80%	10.13%
33	3.01%	4.43%	2.01%	3.01%	1.21%	1.82%	0.69%	1.03%	6.92%	10.29%
34	3.05%	4.50%	2.04%	3.06%	1.23%	1.84%	0.69%	1.04%	7.01%	10.44%
35	3.09%	4.56%	2.07%	3.11%	1.25%	1.88%	0.71%	1.06%	7.12%	10.61%
36	3.14%	4.63%	2.11%	3.16%	1.27%	1.91%	0.72%	1.08%	7.24%	10.78%
37	3.19%	4.70%	2.14%	3.21%	1.30%	1.95%	0.73%	1.10%	7.36%	10.96%
38	3.23%	4.77%	2.17%	3.26%	1.33%	1.99%	0.75%	1.12%	7.48%	11.14%
39	3.28%	4.84%	2.21%	3.31%	1.35%	2.03%	0.77%	1.15%	7.61%	11.33%

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 1 (continued)										
Entry Age	Basic Regular		COLA Regular		Basic Settlement		COLA Settlement		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
40	3.33%	4.92%	2.24%	3.36%	1.38%	2.07%	0.78%	1.17%	7.73%	11.52%
41	3.38%	5.00%	2.27%	3.41%	1.41%	2.11%	0.79%	1.19%	7.85%	11.71%
42	3.44%	5.07%	2.31%	3.47%	1.45%	2.17%	0.82%	1.23%	8.02%	11.94%
43	3.49%	5.16%	2.35%	3.53%	1.48%	2.22%	0.83%	1.25%	8.15%	12.16%
44	3.55%	5.24%	2.39%	3.59%	1.53%	2.29%	0.86%	1.29%	8.33%	12.41%
45	3.61%	5.33%	2.43%	3.65%	1.57%	2.35%	0.89%	1.33%	8.50%	12.66%
46	3.67%	5.42%	2.48%	3.72%	1.61%	2.42%	0.91%	1.37%	8.67%	12.93%
47	3.74%	5.52%	2.53%	3.79%	1.64%	2.46%	0.93%	1.39%	8.84%	13.16%
48	3.81%	5.63%	2.57%	3.86%	1.63%	2.44%	0.92%	1.38%	8.93%	13.31%
49	3.88%	5.74%	2.63%	3.94%	1.59%	2.38%	0.89%	1.34%	8.99%	13.40%
50	3.96%	5.86%	2.68%	4.02%	1.51%	2.26%	0.85%	1.28%	9.00%	13.42%
51	4.04%	5.98%	2.74%	4.11%	1.42%	2.13%	0.80%	1.20%	9.00%	13.42%
52	4.11%	6.08%	2.79%	4.18%	1.31%	1.96%	0.74%	1.11%	8.95%	13.33%
53	4.15%	6.15%	2.82%	4.23%	1.18%	1.77%	0.67%	1.00%	8.82%	13.15%
54	4.18%	6.19%	2.84%	4.26%	1.04%	1.56%	0.59%	0.88%	8.65%	12.89%
55	4.18%	6.19%	2.84%	4.26%	1.04%	1.56%	0.59%	0.88%	8.65%	12.89%
56	4.18%	6.18%	2.83%	4.25%	1.04%	1.56%	0.59%	0.88%	8.64%	12.87%
57	4.14%	6.13%	2.81%	4.21%	1.04%	1.56%	0.59%	0.88%	8.58%	12.78%
58	4.08%	6.04%	2.77%	4.15%	1.04%	1.56%	0.59%	0.88%	8.48%	12.63%
59 & Over	3.99%	5.91%	2.71%	4.06%	1.04%	1.56%	0.59%	0.88%	8.33%	12.41%

Interest: 7.00% per annum

COLA: 2.75%

Administrative Expenses: 0.16% of payroll added to Basic Regular rates

Mortality: See *Section 4, Exhibit I*

Salary Increase: Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)

COLA Loading Factor: 70.61% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses, and 56.47% for Settlement Benefits

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 2						
Entry Age	Basic Regular		COLA Regular		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
15	1.99%	2.91%	1.57%	2.35%	3.56%	5.26%
16	1.99%	2.91%	1.57%	2.35%	3.56%	5.26%
17	2.02%	2.95%	1.59%	2.39%	3.61%	5.34%
18	2.05%	3.00%	1.62%	2.43%	3.67%	5.43%
19	2.08%	3.04%	1.64%	2.46%	3.72%	5.50%
20	2.11%	3.08%	1.67%	2.50%	3.78%	5.58%
21	2.14%	3.13%	1.69%	2.54%	3.83%	5.67%
22	2.17%	3.17%	1.72%	2.58%	3.89%	5.75%
23	2.20%	3.22%	1.75%	2.62%	3.95%	5.84%
24	2.23%	3.27%	1.77%	2.66%	4.00%	5.93%
25	2.26%	3.31%	1.80%	2.70%	4.06%	6.01%
26	2.29%	3.36%	1.83%	2.74%	4.12%	6.10%
27	2.33%	3.41%	1.85%	2.78%	4.18%	6.19%
28	2.36%	3.46%	1.88%	2.82%	4.24%	6.28%
29	2.39%	3.51%	1.91%	2.86%	4.30%	6.37%
30	2.43%	3.56%	1.94%	2.91%	4.37%	6.47%
31	2.46%	3.61%	1.97%	2.95%	4.43%	6.56%
32	2.50%	3.66%	2.00%	3.00%	4.50%	6.66%
33	2.53%	3.72%	2.03%	3.04%	4.56%	6.76%
34	2.57%	3.77%	2.06%	3.09%	4.63%	6.86%
35	2.61%	3.83%	2.09%	3.14%	4.70%	6.97%
36	2.64%	3.89%	2.13%	3.19%	4.77%	7.08%
37	2.68%	3.94%	2.16%	3.24%	4.84%	7.18%
38	2.72%	4.00%	2.19%	3.29%	4.91%	7.29%
39	2.76%	4.06%	2.23%	3.34%	4.99%	7.40%

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 2 (continued)						
Entry Age	Basic Regular		COLA Regular		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
40	2.80%	4.13%	2.26%	3.39%	5.06%	7.52%
41	2.85%	4.19%	2.30%	3.45%	5.15%	7.64%
42	2.89%	4.26%	2.33%	3.50%	5.22%	7.76%
43	2.94%	4.32%	2.37%	3.56%	5.31%	7.88%
44	2.98%	4.40%	2.41%	3.62%	5.39%	8.02%
45	3.03%	4.47%	2.46%	3.69%	5.49%	8.16%
46	3.08%	4.55%	2.50%	3.75%	5.58%	8.30%
47	3.14%	4.63%	2.55%	3.82%	5.69%	8.45%
48	3.20%	4.72%	2.60%	3.90%	5.80%	8.62%
49	3.26%	4.81%	2.65%	3.98%	5.91%	8.79%
50	3.33%	4.91%	2.71%	4.06%	6.04%	8.97%
51	3.39%	5.01%	2.77%	4.15%	6.16%	9.16%
52	3.45%	5.09%	2.81%	4.22%	6.26%	9.31%
53	3.49%	5.15%	2.85%	4.27%	6.34%	9.42%
54	3.51%	5.19%	2.87%	4.30%	6.38%	9.49%
55	3.51%	5.19%	2.87%	4.30%	6.38%	9.49%
56	3.51%	5.18%	2.86%	4.29%	6.37%	9.47%
57	3.48%	5.13%	2.83%	4.25%	6.31%	9.38%
58	3.42%	5.06%	2.79%	4.19%	6.21%	9.25%
59 & Over	3.35%	4.95%	2.73%	4.10%	6.08%	9.05%

Interest: 7.00% per annum  
 COLA: 2.75%  
 Administrative Expenses: 0.16% of payroll added to Basic Regular rates  
 Mortality: See *Section 4, Exhibit I*  
 Salary Increase: Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)  
 COLA Loading Factor: 85.53% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 3						
Entry Age	Basic Regular		COLA Regular		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
15	2.56%	3.77%	1.68%	2.52%	4.24%	6.29%
16	2.56%	3.77%	1.68%	2.52%	4.24%	6.29%
17	2.60%	3.82%	1.71%	2.56%	4.31%	6.38%
18	2.64%	3.88%	1.73%	2.60%	4.37%	6.48%
19	2.68%	3.93%	1.76%	2.64%	4.44%	6.57%
20	2.71%	3.99%	1.79%	2.68%	4.50%	6.67%
21	2.75%	4.05%	1.81%	2.72%	4.56%	6.77%
22	2.79%	4.11%	1.84%	2.76%	4.63%	6.87%
23	2.83%	4.17%	1.87%	2.80%	4.70%	6.97%
24	2.87%	4.23%	1.89%	2.84%	4.76%	7.07%
25	2.91%	4.29%	1.93%	2.89%	4.84%	7.18%
26	2.96%	4.35%	1.95%	2.93%	4.91%	7.28%
27	3.00%	4.42%	1.99%	2.98%	4.99%	7.40%
28	3.04%	4.48%	2.01%	3.02%	5.05%	7.50%
29	3.09%	4.55%	2.05%	3.07%	5.14%	7.62%
30	3.13%	4.62%	2.07%	3.11%	5.20%	7.73%
31	3.18%	4.69%	2.11%	3.16%	5.29%	7.85%
32	3.22%	4.76%	2.14%	3.21%	5.36%	7.97%
33	3.27%	4.83%	2.17%	3.26%	5.44%	8.09%
34	3.32%	4.90%	2.21%	3.31%	5.53%	8.21%
35	3.37%	4.98%	2.25%	3.37%	5.62%	8.35%
36	3.42%	5.06%	2.28%	3.42%	5.70%	8.48%
37	3.48%	5.14%	2.32%	3.48%	5.80%	8.62%
38	3.53%	5.22%	2.36%	3.54%	5.89%	8.76%
39	3.59%	5.31%	2.40%	3.60%	5.99%	8.91%

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 3 (continued)						
Entry Age	Basic Regular		COLA Regular		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
40	3.65%	5.40%	2.44%	3.66%	6.09%	9.06%
41	3.71%	5.49%	2.48%	3.72%	6.19%	9.21%
42	3.78%	5.59%	2.53%	3.79%	6.31%	9.38%
43	3.85%	5.70%	2.58%	3.87%	6.43%	9.57%
44	3.92%	5.80%	2.63%	3.94%	6.55%	9.74%
45	3.99%	5.90%	2.67%	4.01%	6.66%	9.91%
46	4.04%	5.98%	2.71%	4.07%	6.75%	10.05%
47	4.08%	6.04%	2.74%	4.11%	6.82%	10.15%
48	4.10%	6.06%	2.75%	4.12%	6.85%	10.18%
49	4.09%	6.06%	2.75%	4.12%	6.84%	10.18%
50	4.07%	6.02%	2.73%	4.10%	6.80%	10.12%
51	4.02%	5.96%	2.70%	4.05%	6.72%	10.01%
52	3.96%	5.85%	2.65%	3.98%	6.61%	9.83%
53	4.08%	6.04%	2.74%	4.11%	6.82%	10.15%
54 & Over	4.21%	6.23%	2.83%	4.24%	7.04%	10.47%

Interest:	7.00% per annum
COLA:	2.75%
Administrative Expenses:	0.16% of payroll added to Basic Regular rates
Mortality:	See <i>Section 4, Exhibit I</i>
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See <i>Section 4, Exhibit I</i> )
COLA Loading Factor:	69.87% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 4					
Entry Age	Basic Regular		Entry Age	Basic Regular	
	First \$350	Over \$350		First \$350	Over \$350
15	3.68%	5.44%	38	5.07%	7.53%
16	3.68%	5.44%	39	5.15%	7.65%
17	3.73%	5.52%	40	5.23%	7.76%
18	3.79%	5.60%	41	5.31%	7.89%
19	3.84%	5.68%	42	5.40%	8.01%
20	3.90%	5.77%	43	5.48%	8.15%
21	3.96%	5.85%	44	5.57%	8.28%
22	4.01%	5.94%	45	5.67%	8.42%
23	4.07%	6.03%	46	5.77%	8.57%
24	4.13%	6.12%	47	5.87%	8.73%
25	4.19%	6.21%	48	5.98%	8.90%
26	4.25%	6.30%	49	6.10%	9.06%
27	4.31%	6.39%	50	6.20%	9.22%
28	4.38%	6.49%	51	6.29%	9.35%
29	4.44%	6.58%	52	6.35%	9.44%
30	4.51%	6.68%	53	6.37%	9.48%
31	4.57%	6.78%	54	6.37%	9.47%
32	4.64%	6.88%	55	6.33%	9.42%
33	4.71%	6.98%	56	6.26%	9.31%
34	4.78%	7.09%	57	6.15%	9.15%
35	4.85%	7.19%	58	6.35%	9.44%
36	4.92%	7.30%	59 & Over	6.55%	9.74%
37	5.00%	7.41%			

Interest:	7.00% per annum
COLA:	0.00%
Administrative Expenses:	0.16% of payroll added to Basic Regular rates
Mortality:	See <i>Section 4, Exhibit I</i>
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See <i>Section 4, Exhibit I</i> )

## EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

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

Safety Tier 1										
Entry Age	Basic Regular		COLA Regular		Basic Settlement		COLA Settlement		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
15	3.19%	4.70%	3.05%	4.58%	0.75%	1.13%	0.61%	0.91%	7.60%	11.32%
16	3.19%	4.70%	3.05%	4.58%	0.75%	1.13%	0.61%	0.91%	7.60%	11.32%
17	3.22%	4.76%	3.09%	4.64%	0.76%	1.14%	0.61%	0.91%	7.68%	11.45%
18	3.26%	4.81%	3.13%	4.69%	0.78%	1.17%	0.63%	0.94%	7.80%	11.61%
19	3.30%	4.87%	3.17%	4.75%	0.79%	1.18%	0.63%	0.95%	7.89%	11.75%
20	3.34%	4.93%	3.21%	4.82%	0.80%	1.20%	0.64%	0.96%	7.99%	11.91%
21	3.38%	4.99%	3.25%	4.88%	0.81%	1.21%	0.65%	0.97%	8.09%	12.05%
22	3.42%	5.06%	3.29%	4.94%	0.81%	1.22%	0.65%	0.98%	8.17%	12.20%
23	3.47%	5.12%	3.33%	5.00%	0.83%	1.24%	0.66%	0.99%	8.29%	12.35%
24	3.51%	5.18%	3.38%	5.07%	0.84%	1.26%	0.67%	1.01%	8.40%	12.52%
25	3.55%	5.25%	3.42%	5.13%	0.85%	1.27%	0.68%	1.02%	8.50%	12.67%
26	3.60%	5.32%	3.47%	5.20%	0.85%	1.28%	0.69%	1.03%	8.61%	12.83%
27	3.64%	5.38%	3.51%	5.27%	0.87%	1.31%	0.70%	1.05%	8.72%	13.01%
28	3.69%	5.45%	3.56%	5.34%	0.89%	1.33%	0.71%	1.07%	8.85%	13.19%
29	3.74%	5.52%	3.61%	5.41%	0.90%	1.35%	0.72%	1.08%	8.97%	13.36%
30	3.78%	5.60%	3.65%	5.48%	0.91%	1.36%	0.73%	1.09%	9.07%	13.53%
31	3.83%	5.67%	3.71%	5.56%	0.92%	1.38%	0.74%	1.11%	9.20%	13.72%
32	3.89%	5.75%	3.76%	5.64%	0.93%	1.40%	0.75%	1.12%	9.33%	13.91%
33	3.94%	5.83%	3.81%	5.72%	0.95%	1.42%	0.76%	1.14%	9.46%	14.11%
34	4.00%	5.91%	3.87%	5.80%	0.96%	1.44%	0.77%	1.16%	9.60%	14.31%
35	4.05%	6.00%	3.93%	5.89%	0.97%	1.46%	0.78%	1.17%	9.73%	14.52%
36	4.11%	6.09%	3.99%	5.98%	0.99%	1.48%	0.79%	1.19%	9.88%	14.74%
37	4.18%	6.19%	4.05%	6.08%	1.00%	1.50%	0.80%	1.20%	10.03%	14.97%
38	4.25%	6.29%	4.12%	6.18%	1.02%	1.53%	0.82%	1.23%	10.21%	15.23%
39	4.32%	6.40%	4.20%	6.30%	1.04%	1.56%	0.83%	1.25%	10.39%	15.51%

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 1 (continued)										
Entry Age	Basic Regular		COLA Regular		Basic Settlement		COLA Settlement		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
40	4.40%	6.52%	4.28%	6.42%	1.06%	1.59%	0.85%	1.28%	10.59%	15.81%
41	4.48%	6.64%	4.36%	6.54%	1.09%	1.63%	0.87%	1.31%	10.80%	16.12%
42	4.55%	6.74%	4.43%	6.64%	1.09%	1.64%	0.88%	1.32%	10.95%	16.34%
43	4.58%	6.79%	4.46%	6.69%	1.10%	1.65%	0.88%	1.32%	11.02%	16.45%
44	4.61%	6.84%	4.49%	6.73%	1.11%	1.66%	0.89%	1.33%	11.10%	16.56%
45	4.61%	6.84%	4.49%	6.74%	1.11%	1.67%	0.89%	1.34%	11.10%	16.59%
46	4.60%	6.82%	4.48%	6.72%	1.11%	1.67%	0.89%	1.34%	11.08%	16.55%
47	4.56%	6.76%	4.44%	6.66%	1.10%	1.65%	0.88%	1.32%	10.98%	16.39%
48	4.49%	6.65%	4.37%	6.55%	1.08%	1.62%	0.87%	1.30%	10.81%	16.12%
49 & Over	4.39%	6.51%	4.27%	6.41%	1.06%	1.59%	0.85%	1.28%	10.57%	15.79%

Interest: 7.00% per annum

COLA: 2.75%

Administrative Expenses: 0.16% of payroll added to Basic Regular rates

Mortality: See Section 4, Exhibit I

Salary Increase: Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See Section 4, Exhibit I)

COLA Loading Factor: 100.87% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses, and 80.24% for Settlement Benefits

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 2						
Entry Age	Basic Regular		COLA Regular		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
15	3.19%	4.70%	3.39%	5.08%	6.58%	9.78%
16	3.19%	4.70%	3.39%	5.08%	6.58%	9.78%
17	3.22%	4.76%	3.43%	5.15%	6.65%	9.91%
18	3.26%	4.81%	3.47%	5.21%	6.73%	10.02%
19	3.30%	4.87%	3.52%	5.28%	6.82%	10.15%
20	3.34%	4.93%	3.57%	5.35%	6.91%	10.28%
21	3.38%	4.99%	3.61%	5.42%	6.99%	10.41%
22	3.42%	5.06%	3.66%	5.49%	7.08%	10.55%
23	3.47%	5.12%	3.71%	5.56%	7.18%	10.68%
24	3.51%	5.18%	3.75%	5.63%	7.26%	10.81%
25	3.55%	5.25%	3.80%	5.70%	7.35%	10.95%
26	3.60%	5.32%	3.85%	5.78%	7.45%	11.10%
27	3.64%	5.38%	3.90%	5.85%	7.54%	11.23%
28	3.69%	5.45%	3.95%	5.93%	7.64%	11.38%
29	3.74%	5.52%	4.01%	6.01%	7.75%	11.53%
30	3.78%	5.60%	4.06%	6.09%	7.84%	11.69%
31	3.83%	5.67%	4.12%	6.18%	7.95%	11.85%
32	3.89%	5.75%	4.17%	6.26%	8.06%	12.01%
33	3.94%	5.83%	4.23%	6.35%	8.17%	12.18%
34	4.00%	5.91%	4.30%	6.45%	8.30%	12.36%
35	4.05%	6.00%	4.36%	6.54%	8.41%	12.54%
36	4.11%	6.09%	4.43%	6.65%	8.54%	12.74%
37	4.18%	6.19%	4.50%	6.75%	8.68%	12.94%
38	4.25%	6.29%	4.58%	6.87%	8.83%	13.16%
39	4.32%	6.40%	4.66%	6.99%	8.98%	13.39%

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 2 (continued)						
Entry Age	Basic Regular		COLA Regular		Total	
	First \$350	Over \$350	First \$350	Over \$350	First \$350	Over \$350
40	4.40%	6.52%	4.75%	7.13%	9.15%	13.65%
41	4.48%	6.64%	4.85%	7.27%	9.33%	13.91%
42	4.55%	6.74%	4.91%	7.37%	9.46%	14.11%
43	4.58%	6.79%	4.95%	7.43%	9.53%	14.22%
44	4.61%	6.84%	4.99%	7.48%	9.60%	14.32%
45	4.61%	6.84%	4.99%	7.49%	9.60%	14.33%
46	4.60%	6.82%	4.97%	7.46%	9.57%	14.28%
47	4.56%	6.76%	4.93%	7.40%	9.49%	14.16%
48	4.49%	6.65%	4.85%	7.27%	9.34%	13.92%
49 & Over	4.39%	6.51%	4.75%	7.12%	9.14%	13.63%

Interest: 7.00% per annum

COLA: 2.75%

Administrative Expenses: 0.16% of payroll added to Basic Regular rates

Mortality: See *Section 4, Exhibit I*

Salary Increase: Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)

COLA Loading Factor: 112.05% for Regular Benefits, applied to Basic rates prior to adjustment for administrative expenses

### EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 4					
Entry Age	Basic Regular		Entry Age	Basic Regular	
	First \$350	Over \$350		First \$350	Over \$350
15	5.94%	8.83%	33	7.38%	10.99%
16	5.94%	8.83%	34	7.49%	11.15%
17	6.01%	8.94%	35	7.60%	11.32%
18	6.09%	9.05%	36	7.71%	11.49%
19	6.16%	9.17%	37	7.84%	11.68%
20	6.24%	9.28%	38	7.97%	11.87%
21	6.32%	9.40%	39	8.10%	12.07%
22	6.40%	9.52%	40	8.23%	12.26%
23	6.48%	9.64%	41	8.32%	12.40%
24	6.56%	9.76%	42	8.38%	12.49%
25	6.64%	9.88%	43	8.41%	12.53%
26	6.73%	10.01%	44	8.40%	12.52%
27	6.81%	10.14%	45	8.35%	12.44%
28	6.90%	10.27%	46	8.25%	12.29%
29	6.99%	10.41%	47	8.10%	12.07%
30	7.09%	10.55%	48	8.36%	12.46%
31	7.18%	10.69%	49 & Over	8.63%	12.86%
32	7.28%	10.84%			

Interest: 7.00% per annum  
 COLA: 0.00%  
 Administrative Expenses: 0.16% of payroll added to Basic Regular rates  
 Mortality: See Section 4, Exhibit I  
 Salary Increase: Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See Section 4, Exhibit I)

## EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

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

All Entry Ages	Total
General Tier 5	7.30%
Safety Tier 5	11.96%

Administrative Expenses: 0.16% of payroll added to the rates

Note: Tier 5 member contribution rate is 50% of the Normal Cost rates. 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 \$124,180. For an employer that is not enrolled in Social Security, the maximum amount is \$149,016 (reference Section 7522.10). These amounts are adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019 (reference Section 7522.10(d)).

## EXHIBIT IV – SCHEDULE OF UAAL AND ASSOCIATED FUNDED RATIOS

	Regular Benefit (\$ in '000s)	Settlement Benefit (\$ in '000s)	Total (\$ in '000s)
A. Actuarial Accrued Liability	\$4,778,878	\$1,307,776	\$6,086,654
B. Valuation Value of Assets	\$3,938,425	\$1,032,800	\$4,971,225
C. UAAL (A – B)	\$840,453	\$274,976	\$1,115,429
D. Funded Ratio (B / A)	82.41%	78.97%	81.67%

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