San Diego County Employees Retirement Association

Actuarial Valuation and Review as of June 30, 2019

Segal Consulting

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November 15, 2019

Board of Retirement
San Diego County Employees Retirement Association
2275 Rio Bonito Way, Suite 100
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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 (FY 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:

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Vice President and 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 San Diego County Employees Retirement Association ("SDCERA" 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 of Retirement;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of June 30, 2019, provided by SDCERA;
- The assets of the Plan as of June 30, 2019, provided by SDCERA;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board of Retirement for the June 30, 2019 valuation;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. adopted by the Board of Retirement for the June 30, 2019 valuation; and
- The funding policy adopted by the Board of Retirement.

One of the general goals of an actuarial valuation is to establish contributions which fully fund the 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 last reviewed by the Board in 2013. Details of the funding policy are provided in *Section 4, Exhibit I on page 87.*

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 72 and 73.*

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.

Also, we include a recommendation to combine the $69 million in deferred investment loss from the asset smoothing method into a single layer to be recognized over the next four and a half years. A more detailed discussion can be found in the *Significant Issue Section* on pages 7 and 8.

Significant Issues

Ref: Pg. 78

1. 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 (primarily due to the change in mortality and investment return assumptions) resulted in an increase in the average employer rate of 3.44% of payroll and an increase in the average member rate of 0.86% of payroll. Of the 3.44% increase in the employer rate, 1.19% is due to an increase in the Normal Cost and 2.25% is due to an increase in the UAAL rate.

Ref: Pg. 37
Ref: Pg. 29

2. The ratio of the Valuation Value of Assets to Actuarial Accrued Liabilities decreased slightly from 78.4% to 76.3%. The ratio of the Market Value of Assets (net of non-valuation reserves) to the Actuarial Accrued Liability decreased from 77.9% to 75.9%. The Association's UAAL (which is based on the Valuation Value of Assets) has increased from $3.4 billion to $4.0 billion. The increase in UAAL is primarily due to changes in actuarial assumptions, investment return after "smoothing" less than the 7.25% return assumption used in the 2018 valuation, higher than expected individual salary increases for actives and actual contribution experience during FY 2019. A complete reconciliation of the Association's UAAL is provided in *Section 2, Subsection E*.

Ref: Pg. 69

3. The Board approved an adjustment to the remaining amortization periods for certain amortization layers in order to minimize the contribution rate tail volatility associated with the UAAL layers that were to be fully amortized between the 2024 and 2030 valuations. This is done by setting the amortization period for those UAAL layers to six years in the 2019 valuation. The adjustment extended the amortization period for the 2004 UAAL reamortization by one year, and resulted in a decrease in the average employer rate of 0.83% of payroll before taking into consideration other events in the 2019 valuation.

Ref: Pg. 31

4. The average employer contribution rate calculated in this valuation increased from 42.51% of payroll to 46.16% of payroll. This increase is primarily due to changes in actuarial assumptions and investment return after "smoothing" less than the 7.25% return assumption, partially offset by the effect of amortizing prior year's UAAL over a larger than expected projected total payroll and the adjustment to UAAL amortization periods to minimize the contribution rate tail volatility. A complete reconciliation of the Association's average employer rate is provided in *Section 2, Subsection F*.

5. On October 30, 2018, the County Board of Supervisors finalized the implementation of MOUs with all of its Safety Member Bargaining units. The MOUs allow the County to commence the process to implement Safety Tier D benefit formula with service retirement pursuant to Section §7522.25(c) (i.e., 2.5% at 57) for new Safety employees entering SDCERA on or after July 1, 2020. As there were no actual active members in Safety Tier D as of the valuation date on June 30, 2019, we have calculated the Safety Tier D Normal Cost contribution rates for FY 2021 based on the new actuarial assumptions used in the June 30, 2019 valuation and assuming the demographic profiles of members to be enrolled in Safety Tier D would be the same as those of current active Safety Tier C members.

Ref: Pg. 32

6. The average member rate calculated in this valuation has increased from 11.38% of payroll to 12.23% of payroll. This change is primarily due to changes in actuarial assumptions. A complete reconciliation of the Association's average member rate is provided in *Section 2, Subsection F*.

Ref: Pg. 20

7. The total unrecognized net investment loss as of June 30, 2019 is about $69 million as compared to an unrecognized net investment loss of $91 million in the previous valuation. This deferred investment loss of $69 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 $69 million represent about 0.5% of the Market Value of Assets. Unless offset by future investment gains or other favorable experience, the recognition of the $69 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 76.3% to 75.9%.

      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 78.4% to 77.9%.

   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 46.16% to 46.52% 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 42.97% to 43.47% of payroll.

   Footnote (3) in the Determination of Actuarial Value of Assets on page 20 shows that under the asset smoothing method the $69 million in the net deferred loss will be recognized in the next four and a half years (i.e., nine semi-annual periods), but in a very uneven pattern. In particular, there will be a loss of $111 million recognized next year, followed in successive following years by a gain of $48 million, a gain of $8 million, a loss of $88 million, and finally a gain of $74 million. This means that, absent any new gains or losses in the future, there will be some relatively large swings in the employer contribution rate that are offsetting at the end of the four and a half years.

   In keeping with the Board's Funding Policy and consistent with a similar action taken by the Board in 2013, the asset smoothing method could be adjusted by combining the net deferred loss of $69 million from the current valuation into a single four and a half years smoothing "layer" and thereby recognizing the net deferred loss of $69 million over the next four and a half years in nine level amounts of approximately $8 million each six month period. This would reduce the volatility associated with the current pattern of the deferred gain/loss recognition and thereby result in more stable funded ratios (on an actuarial value basis) and more level employer contribution rates.

Please note that this change would have no impact on the current June 30, 2019 valuation results as the total amount of the net unrecognized loss as of June 30, 2019 remains unchanged. Also, note that we recommend using a four and a half years smoothing period for the combined deferred net loss as that will complete the recognition of the net loss over the same time period as under the current separate smoothing layers. We will provide more discussion of this policy option during our presentation of the June 30, 2019 valuation.

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.

9. This report reflects the $13.8 million in additional Safety contributions made by County towards their UAAL. The $13.8 million of additional contributions made by County has been amortized as a level percent of pay over a period of twenty years effective on June 30, 2019 and used to reduce their Safety UAAL rates for FY 2021.

Ref: Pg. 41

10. The Actuarial Standards Board approved a new Actuarial Standard of Practice No. 51 (ASOP 51) regarding risk assessment. ASOP 51 is effective with SDCERA'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 SDCERA 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 SDCERA 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[1] ($ in '000s)	Total Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Employer Contribution Rates:	• General, other than Tier C and Tier D	44.32%	$295,692	40.39%	$269,487
	• General Tier C (CalPEPRA)	37.66%	109,499	34.13%	99,236
	• General Tier D (CalPEPRA)	35.02%	26,373	31.84%	23,977
	• General Combined	41.77%	431,564	38.01%	392,700
	• Safety, other than Tier C and Tier D	62.26%	149,722	58.75%	141,273
	• Safety Tier C (CalPEPRA)	53.99%	46,201	51.24%	43,847
	• Safety Tier D (CalPEPRA)	53.29%	0	50.58%[2]	0
	• Safety Combined	60.09%	195,923	56.78%	185,120
	All Categories Combined	46.16%	$627,487	42.51%[3]	$577,820
Average Member Contribution Rates:	• General Tier 1	11.70%	$200	10.80%	$184
	• General Tier A	13.03%	72,409	12.04%	66,907
	• General Tier B	10.63%	11,671	9.54%	10,475
	• General Tier C	9.14%	26,575	8.31%	24,162
	• General Tier D	6.50%	4,895	6.02%	4,533
	• Safety Tier A	15.97%	31,552	15.30%	30,229
	• Safety Tier B	13.75%	5,898	12.68%	5,439
	• Safety Tier C	15.23%	13,033	14.88%	12,733
	• Safety Tier D	14.53%	0	14.22%[2]	0
	All Categories Combined	12.23%	$166,233	11.38%[3]	$154,662

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

(2) Contribution rates for Safety Tier D were provided in our Safety Tier D Implementation Study dated November 27, 2018.

(3) The average recommended employer and member contribution rates as of June 30, 2018 has been recalculated based on the June 30, 2019 projected annual compensation for each membership class. The average employer and member contribution rates as of June 30, 2018 calculated based on June 30, 2018 projected annual compensation for each membership class were 42.97% and 11.67%, respectively, as provided in the June 30, 2018 report.

Summary of Key Valuation Results (continued)

		June 30, 2019 ($ in '000s)	June 30, 2018 ($ in '000s)
Actuarial Accrued Liability as of June 30:	• Retired members and beneficiaries	$10,322,407	$9,563,887
	• Inactive vested members[1]	518,999	481,009
	• Active members	6,113,706	5,718,341
	• Total Actuarial Accrued Liability	16,955,112	15,763,237
	• Normal Cost for plan year beginning June 30	372,657	339,583
Assets as of June 30:	• Market Value of Assets (MVA), Net of Non-Valuation Reserves	$12,862,922	$12,274,477
	• Valuation Value of Assets (VVA)	12,932,244	12,365,656
Funded status as of June 30:	• Unfunded Actuarial Accrued Liability on Market Value of Assets basis	$4,092,190	$3,488,760
	• Funded percentage on MVA basis	75.86%	77.87%
	• Unfunded Actuarial Accrued Liability on Valuation Value of Assets basis	$4,022,868	$3,397,581
	• Funded percentage on VVA basis	76.27%	78.45%
Key assumptions:	• Net investment return	7.00%	7.25%
	• Price inflation	2.75%	3.00%
	• Payroll growth	3.25%	3.50%

[1] Includes inactive members who choose to leave member contributions on deposit with less than five years of service.

Summary of Key Valuation Results (continued)

		June 30, 2019	June 30, 2018	Change From Prior Year
Demographic data as of June 30:	**Active Members:**			
	• Number of members	18,173	17,869	1.7%
	• Average age	43.9	44.1	-0.2
	• Average service	10.7	11.0	-0.3
	• Total projected compensation	$1,359,311,226	$1,290,949,926	5.3%
	• Average projected compensation	$74,798	$72,245	3.5%
	Retired Members and Beneficiaries:			
	• Number of members:			
	– Service retired	15,596	15,018	3.8%
	– Disability retired	1,710	1,711	-0.1%
	– Beneficiaries	2,400	2,299	4.4%
	– Total	19,706	19,028	3.6%
	• Average age	69.8	69.5	0.3
	• Average monthly benefit	$3,280	$3,170	3.5%
	Inactive Vested Members:			
	• Number of members[1]	6,151	5,928	3.8%
	• Average Age	45.9	46.2	-0.3
	Total Members:	44,030	42,825	2.8%

[1] Includes inactive members who choose to leave member contributions on deposit with less than five years of service.

Important Information About Actuarial Valuations

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

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

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the 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.
Assets	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.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, 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[1]	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2010	16,981	5,254	13,922	19,176	1.13	0.82
2011	16,523	5,125	14,496	19,621	1.19	0.88
2012	16,457	5,039	15,166	20,205	1.23	0.92
2013	16,891	5,000	15,820	20,820	1.23	0.94
2014	17,466	5,091	16,373	21,464	1.23	0.94
2015	17,656	5,274	17,186	22,460	1.27	0.97
2016	17,768	5,413	17,734	23,147	1.30	1.00
2017	17,994	5,659	18,247	23,906	1.33	1.01
2018	17,869	5,928	19,028	24,956	1.40	1.06
2019	18,173	6,151	19,706	25,857	1.42	1.08

[1] Includes inactive members who choose to leave member contributions on deposit with less than five years of service.

Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 18,173 active members with an average age of 43.9, average years of service of 10.7 years and average compensation of $74,798. The 17,869 active members in the prior valuation had an average age of 44.1, average service of 11.0 years and average compensation of $72,245.

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

Distribution of Active Participants as of June 30, 2019

Inactive Members

In this year's valuation, there were 6,151 members with a vested right to a deferred or immediate vested benefit or entitled to a return of their member contributions versus 5,928 in the prior valuation.

Retired Members and Beneficiaries

As of June 30, 2019, 17,306 retired members and 2,400 beneficiaries were receiving total monthly benefits of $64,643,286. For comparison, in the previous valuation, there were 16,729 retired members and 2,299 beneficiaries receiving monthly benefits of $60,321,639.

As of June 30, 2019, the average monthly benefit for retired members and beneficiaries is $3,280, compared to $3,170 in the previous valuation. The average age for retired members and beneficiaries is 69.8 in the current valuation, compared with 69.5 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	16,981	45.5	11.3	13,922	68.8	$2,540
2011	16,523	45.8	11.7	14,496	68.8	2,617
2012	16,457	45.6	11.7	15,166	68.8	2,733
2013	16,891	45.1	11.5	15,820	68.9	2,801
2014	17,466	44.8	11.2	16,373	69.1	2,859
2015	17,656	44.7	11.2	17,186	69.1	2,905
2016	17,768	44.6	11.2	17,734	69.2	2,963
2017	17,994	44.4	11.1	18,247	69.5	3,041
2018	17,869	44.1	11.0	19,028	69.5	3,170
2019	18,173	43.9	10.7	19,706	69.8	3,280

B. Financial Information

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

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

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

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

DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1	Market Value of Assets[1]					$12,882,533,653
2	Calculation of unrecognized return[2]	Actual Return	Expected Return	Investment Gain / (Loss)	Percent Deferred	Unrecognized Amount
a)	Six months ended December 31, 2014	$119,504,895	$394,295,090	$(274,790,196)	0%	$0
b)	Six months ended June 30, 2015	109,066,220	397,349,983	(288,283,763)	10	(28,828,376)
c)	Six months ended December 31, 2015	(191,207,912)	386,704,127	(577,912,039)	20	(115,582,408)
d)	Six months ended June 30, 2016	240,985,994	377,344,430	(136,358,436)	30	(40,907,531)
e)	Six months ended December 31, 2016	428,031,532	371,539,799	56,491,733	40	22,596,693
f)	Six months ended June 30, 2017	807,091,824	385,289,150	421,802,674	50	210,901,337
g)	Six months ended December 31, 2017	904,963,814	413,919,909	491,043,905	60	294,626,343
h)	Six months ended June 30, 2018	(1,761,593)	446,336,489	(448,098,082)	70	(313,668,657)
i)	Six months ended December 31, 2018	(508,675,405)	445,128,409	(953,803,815)	80	(763,043,052)
j)	Six months ended June 30, 2019	1,163,828,252	425,402,285	738,425,967	90	664,583,370
k)	Total unrecognized return[3]					$(69,322,281)
3	Actuarial Value of Assets 1 – 2k					$12,951,855,934
4	Actuarial Value of Assets as a percentage of Market Value of Assets 3 / 1					100.5%
5	Non-valuation reserves:					
a)	Supplemental Benefit Reserve					$0
b)	401(h) Reserve					19,611,997
c)	Disability Supplemental Benefit Reserve					0
d)	Contingency Reserve					0
e)	Undistributed Reserve					0
f)	Subtotal					$19,611,997
6	Valuation Value of Assets 3 – 5f					$12,932,243,936

Note: Results may be slightly off due to rounding.

(1) The value of market value of assets net of non-valuation reserves is $12,862,921,656.

(2) Recognition at 10% per six month period over 5 years.

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

(a)	Amount recognized on June 30, 2020	$(110,509,995)	(d) Amount recognized on June 30, 2023	(87,885,378)
(b)	Amount recognized on June 30, 2021	47,536,633	(e) Amount recognized on June 30, 2024	73,842,597
(c)	Amount recognized on June 30, 2022	7,693,863	(f) Subtotal	$(69,322,281)

ALLOCATION OF VALUATION VALUE OF ASSETS AS OF JUNE 30, 2019

		Allocated Assets for Funding		
		General	Safety	Total
1	**Beginning of Year Asset Allocation**	**$8,727,202,558**	**$3,638,453,485**	**$12,365,656,043**
2	Percentage of Total Employee Contributions Excluding Pickups	69.00%	31.00%	100.00%
3	Member Contributions[1]	100,562,928	45,182,789	145,745,717
4	Employer Contributions Including Pickups[1]	353,318,358	179,090,007	532,408,365
5	Annual Allowances for Retired Members (From Last Year's Valuation Report)	529,391,791	194,467,880	723,859,671
6.1	Benefit Payments Allocated in Proportion to (5)	540,147,650	198,418,960	738,566,610
6.2	Refunds, Allocated in Proportion to (2)	3,654,931	1,642,070	5,297,001
7	Subtotal (Items 1 + 3 + 4 - 6.1 - 6.2)	$8,637,281,263	$3,662,665,251	$12,299,946,514
8	Total Valuation Value of Assets			12,932,243,936
9	Residual to Allocate = (Items 8 - 7)			632,297,422
10	Allocate Residual in Proportion to (7)	444,012,555	188,284,867	632,297,422
11	**End of Year Asset Allocation (Items 7 + 10)**	**$9,081,293,818**	**$3,850,950,118**	**$12,932,243,936**

Note: Results may be slightly off due to rounding.

[1] The breakdown between General and Safety was provided by SDCERA.

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 $321.7 million, which includes $262.2 million from investment losses, a net loss of $27.8 million from contribution experience (including a gain of $14.7 million from additional UAAL payments from County after adjustment of timing and a loss of $42.5 million from all other contribution experience) and $31.7 million in losses from all other sources. The net experience variation from individual sources other than investments and contributions was 0.2% of the Actuarial Accrued Liability. A discussion of the major components of the actuarial experience is on the following pages.

ACTUARIAL EXPERIENCE FOR YEAR ENDED JUNE 30, 2019

1	Net loss from investments[1]	$(262,197,000)
2	Net loss from contribution experience[2]	(27,832,000)
3	Net loss from other experience[2]	(31,703,000)
4	Net experience loss: 1 + 2 + 3	$(321,732,000)

[1] Details on next page.

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

Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the Market Value of Assets was 5.34% for the year ended June 30, 2019.

For valuation purposes, the assumed rate of return on the Valuation Value of Assets is 7.25% (based on the June 30, 2018 actuarial valuation). The actual rate of return on a valuation basis for the 2019 plan year was 5.12%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended June 30, 2019 with regard to its investments.

INVESTMENT EXPERIENCE FOR YEAR ENDED JUNE 30, 2019

		Market Value	Actuarial Value	Valuation Value
1	Net investment income	$654,315,000	$632,458,000	$632,297,000
2	Average value of assets	12,263,626,000	12,354,805,000	12,337,860,000
3	Rate of return: 1 ÷ 2	5.34%	5.12%	5.12%
4	Assumed rate of return	7.25%	7.25%	7.25%
5	Expected investment income: 2 x 4	$889,113,000	$895,723,000	$894,495,000
6	Actuarial gain/(loss): 1 – 5	$(234,798,000)	$(263,265,000)	$(262,198,000)

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

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

Year Ended June 30	Market Value Investment Return		Actuarial Value Investment Return		Valuation Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent
2010	$820,376,000	13.39%	$129,275,000	1.52%	$127,686,000	1.53%
2011	1,425,637,000	20.91%	203,518,000	2.39%	202,986,000	2.42%
2012	443,667,000	5.46%	146,380,000	1.70%	146,477,000	1.72%
2013	658,746,000	7.78%	666,122,000	7.72%	665,804,000	7.77%
2014	1,208,144,000	13.39%	744,721,000	8.10%	711,249,000	7.77%
2015	228,595,000	2.25%	763,461,000	7.74%	774,537,000	7.91%
2016	49,754,000	0.48%	577,770,000	5.49%	597,709,000	5.70%
2017	1,235,025,000	12.08%	629,271,000	5.72%	630,967,000	5.74%
2018	903,528,000	7.93%	823,054,000	7.11%	822,352,000	7.12%
2019	654,315,000	5.34%	632,458,000	5.12%	632,297,000	5.12%
Most recent five-year geometric average return		**5.54%**		**6.23%**		**6.31%**
Most recent ten-year geometric average return		**8.75%**		**5.23%**		**5.25%**

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 $678.2 million, compared to the projected amount of $705.4 million. This resulted in a net loss of $27.8 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 $31.7 million, which is 0.2% of the Actuarial Accrued Liability. This loss was mainly due to higher than expected individual salary increases for actives. 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 $17.0 billion, an increase of $1.2 billion, or 7.6%, 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 5, 2019.
  - These changes, primarily the mortality and the investment return assumption changes, increased the Actuarial Accrued Liability by about $435 million (or a 2.6% increase) and increased the total (employer and member) Normal Cost by 2.05% of payroll (an increase of about 8.1%). The total (Normal Cost and UAAL) contribution rate increase for the employer and the member as a result of the assumption changes was 4.30% of payroll.
  - The assumption changes include changes to inflation, investment return, merit and promotion salary increases, retirement from active employment, retirement age for deferred vested members, reciprocal salary increases, percent married, 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 sick leave conversion.
- Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan Provisions

- Safety Tier D is added and effective for all Safety members with membership date on or after July 1, 2020.
- 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)

1	**Unfunded Actuarial Accrued Liability at beginning of year**		**$3,397,581**
2	Total Normal Cost at middle of year		339,583
3	Expected employer and member contributions		(705,366)
4	Interest		234,363
5	Expected Unfunded Actuarial Accrued Liability at end of year		$3,266,161
6	Changes due to:		
	a) Investment return less than expected after "smoothing"	$262,197	
	b) Actual contributions less than expected in item 3[1][2]	42,532	
	c) Additional Safety UAAL contribution from County[2]	(14,700)	
	d) Individual salary increases higher than expected	29,087	
	e) Other experience loss	2,616	
	f) Changes in actuarial assumptions[3]	434,975	
	Total changes		$756,707
7	**Unfunded Actuarial Accrued Liability at end of year**		**$4,022,868**

Note: The sum of items 6b and 6c equals the "Net loss from contribution experience" shown in Subsection C.

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

(1) Includes contribution loss from scheduled one-year delay in implementing in FY 2020 the higher contribution rates recommended in June 30, 2018 valuation.

(2) The net loss from contribution experience during the year (item 6b plus item 6c) was $27,832,000.

(3) These changes were documented in our Actuarial Experience Study and are also outlined in *Section 4, Exhibit I* of this report. Of the various assumption changes, the most significant cost impact is $354 million from change in the mortality assumption.

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 46.16% 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
1	Total Normal Cost	$372,657	27.42%	$339,583	26.30%
2	Expected member contributions	166,233	12.23%	150,654	11.67%
3	Employer Normal Cost: 1 – 2	$206,424	15.19%	$188,929	14.63%
4	Actuarial Accrued Liability	16,955,112		15,763,237	
5	Valuation Value of Assets	12,932,244		12,365,656	
6	Unfunded Actuarial Accrued Liability: 4 – 5	$4,022,868		$3,397,581	
7	Payment on Unfunded Actuarial Accrued Liability	$421,063	30.97%	$365,781	28.34%
8	Total average recommended employer contribution: 3 + 7	$627,487	46.16%	$554,710	42.97%
9	Projected compensation	$1,359,312		$1,290,950	

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

Reconciliation of Average Recommended Employer Contribution Rate

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

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

	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Recommended Employer Contribution as of June 30, 2018	**42.51%[2]**	**$577,820**
• Effect of investment return less than expected after "smoothing"	1.38%	$18,759
• Effect of actual contributions less than expected[3]	0.22%	2,990
• Effect of additional Safety UAAL contributions from County	(0.08%)	(1,087)
• Effect of individual salary increases higher than expected	0.15%	2,039
• Effect of amortizing prior year's UAAL over a larger than expected projected total payroll	(0.47%)	(6,387)
• Effect of adjustment to UAAL amortization periods	(0.83%)	(11,282)
• Effect of changes in demographics of members amongst tier	(0.07%)	(952)
• Effect of other experience losses	(0.09%)	(1,173)
• Effect of changes in actuarial assumptions[4]	3.44%	46,760
Total change	3.65%	$49,667
Average Recommended Employer Contribution as of June 30, 2019	**46.16%**	**$627,487**

(1) Based on June 30, 2019 projected annual compensation of $1,359,312,000.

(2) The average recommended employer contribution rate as of June 30, 2018 has been recalculated based on the June 30, 2019 projected annual compensation for each membership class. The average employer contribution rate as of June 30, 2018 calculated based on the June 30, 2018 projected annual compensation was 42.97% as provided in the June 30, 2018 report.

(3) Includes contribution loss from scheduled one-year delay in implementing in FY 2020 the higher contribution rates recommended in June 30, 2018 valuation.

(4) These changes were documented in our Actuarial Experience Study and are also outlined in *Section 4, Exhibit I* of this report. Of the various assumption changes, the most significant cost impact is 2.36% from change in the mortality assumption.

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[1] ($ in '000s)
Average Recommended Member Contribution as of June 30, 2018	**11.38%[2]**	**$154,662**
• Effect of changes in member demographic amongst tiers	(0.01%)	$(119)
• Effect of changes in actuarial assumptions[3]	0.86%	11,690
Total change	0.85%	$11,571
Average Recommended Member Contribution as of June 30, 2019	**12.23%**	**$166,233**

(1) Based on June 30, 2019 projected annual compensation of $1,359,312,000.

(2) The average recommended member contribution rate as of June 30, 2018 has been recalculated based on the June 30, 2019 projected annual compensation for each membership class. The average member contribution rate as of June 30, 2018 calculated based on the June 30, 2018 projected annual compensation was 11.67% as provided in the June 30, 2018 report.

(3) These changes were documented in our Actuarial Experience Study and are also outlined in *Section 4, Exhibit I* of this report. Of the various assumption changes, the most significant cost impact is 0.51% from change in the mortality assumption.

Recommended Employer Contribution Rates

	June 30, 2019 Actuarial Valuation Recommended Rates for FY 2020-21		June 30, 2018 Actuarial Valuation Recommended Rates for FY 2019-20	
	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
General Non-CalPEPRA Tiers				
Normal Cost[2]	15.80%	$105,403	14.57%	$97,213
UAAL[2]	28.52%	190,289	25.82%	172,274
Total Contributions	44.32%	$295,692	40.39%	$269,487
General Tier C (CalPEPRA)				
Normal Cost[2]	9.14%	$26,575	8.31%	$24,162
UAAL[2]	28.52%	82,924	25.82%	75,074
Total Contributions	37.66%	$109,499	34.13%	$99,236
General Tier D (CalPEPRA)				
Normal Cost[2]	6.50%	$4,895	6.02%	$4,533
UAAL[2]	28.52%	21,478	25.82%	19,444
Total Contributions	35.02%	$26,373	31.84%	$23,977
General Tiers Combined				
Normal Cost[2]	13.25%	$136,873	12.19%	$125,908
UAAL[2]	28.52%	294,691	25.82%	266,792
Total Contributions	41.77%	$431,564	38.01%	$392,700

[1] Amounts are in thousands and are based on June 30, 2019 projected annual payroll (also in thousands):

General Tier 1	$1,706
General Tier A	555,708
General Tier B	109,797
General Tier C	290,758
General Tier D	75,307
General Subtotal	$1,033,276

[2] A breakdown of the employer's total Normal Cost and UAAL to fund for each type of benefit is provided on page 35.

Recommended Employer Contribution Rates (continued)

	June 30, 2019 Actuarial Valuation Recommended Rates for FY 2020-21		June 30, 2018 Actuarial Valuation Recommended Rates for FY 2019-20	
	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Safety Non-CalPEPRA Tiers				
Normal Cost[2]	23.50%	$56,518	22.39%	$53,840
UAAL[2]	38.76%	93,204	36.36%	87,433
Total Contributions	62.26%	$149,722	58.75%	$141,273
Safety Tier C (CalPEPRA)				
Normal Cost[2]	15.23%	$13,033	14.88%	$12,733
UAAL[2]	38.76%	33,168	36.36%	31,114
Total Contributions	53.99%	$46,201	51.24%	$43,847
Safety Tier D (CalPEPRA)				
Normal Cost[2]	14.53%	$0	14.22%	$0
UAAL[2]	38.76%	0	36.36%	0
Total Contributions	53.29%	$0	50.58%	$0
Safety Tiers Combined				
Normal Cost[2]	21.33%	$69,551	20.42%	$66,573
UAAL[2]	38.76%	126,372	36.36%	118,547
Total Contributions	60.09%	$195,923	56.78%	$185,120
All Categories Combined				
Normal Cost[2]	15.19%	$206,424	14.16%	$192,481
UAAL[2]	30.97%	421,063	28.35%	385,339
Total Contributions	46.16%	$627,487	42.51%	$577,820

[1] Amounts are in thousands and are based on June 30, 2019 projected annual payroll (also in thousands):

Safety Tier A	$197,572
Safety Tier B	42,892
Safety Tier C	85,572
Safety Tier D	0
Safety Subtotal	$326,036
General & Safety Total	$1,359,312

[2] A breakdown of the employer's total Normal Cost and UAAL to fund for each type of benefit is provided on page 35.

Recommended Employer Contribution Rates (continued)

Breakdown of the Employer's Normal Cost and UAAL Contributions to Fund for Each Type of Benefit (% of Payroll)

	Elements of Normal Cost		
Normal Cost	**General**	**Safety**	**Total**
Service Retirement[1]	8.59%	12.70%	9.57%
Vested Termination and Refunds	2.97%	2.50%	2.86%
Non Service and Service Connected Disability	1.46%	5.62%	2.46%
Non Service and Service Connected Death	0.23%	0.51%	0.30%
Total Employer Normal Cost	13.25%	21.33%	15.19%
Total Member Normal Cost[1]	11.20%	15.48%	12.23%
Employer Plus Member Normal Cost	24.45%	36.81%	27.42%

	Elements of UAAL		
Unfunded Actuarial Accrued Liability[2]	**General**	**Safety**	**Total**
Service Retirement	27.69%	35.92%	29.66%
Vested Termination and Refunds[3]	(0.04%)	(0.13%)	(0.06%)
Non Service and Service Connected Disability	0.71%	2.77%	1.20%
Non Service and Service Connected Death	0.16%	0.20%	0.17%
Total Employer Unfunded Actuarial Accrued Liability	28.52%	38.76%	30.97%

(1) Assuming that member normal cost is only used to fund service retirement benefit.

(2) Assuming that the liability for all inactive members is fully funded.

(3) AAL which is used in the calculation of UAAL is negative when the present value of future benefit is less than the present value of future normal cost.

G. Funded Status

A commonly reported piece of information regarding the Plan's financial status is the funded ratio. These ratios compare the Market and 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 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[1] (a)	Actuarial Accrued Liability (AAL)[2] (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	$8,433,310,000	$9,999,161,000	$1,565,851,000	84.34%	$1,095,582,000	142.92%
2011	8,542,291,000	10,482,657,000	1,940,366,000	81.49%	1,090,413,000	177.95%
2012	8,607,483,000	10,943,172,000	2,335,689,000	78.66%	1,052,366,000	221.95%
2013	9,186,032,000	11,631,237,000	2,445,205,000	78.98%	1,067,792,000	229.00%
2014	9,824,431,000	12,141,149,000	2,316,718,000	80.92%	1,122,864,000	206.32%
2015	10,535,337,000	13,080,080,000	2,544,743,000	80.54%	1,163,363,000	218.74%
2016	11,030,635,000	14,349,090,000	3,318,455,000	76.87%	1,206,941,000	274.95%
2017	11,566,927,000	14,937,873,000	3,370,946,000	77.43%	1,253,222,000	268.98%
2018	12,365,656,000	15,763,237,000	3,397,581,000	78.45%	1,290,950,000	263.18%
2019	12,932,244,000	16,955,112,000	4,022,868,000	76.27%	1,359,312,000	295.95%

(1) Excludes assets for Supplemental Benefit and Health Benefit Reserves.

(2) Excludes liabilities held for Supplemental Benefit and Health Benefit Reserves.

H. Actuarial Balance Sheet

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

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

ACTUARIAL BALANCE SHEET FOR YEAR ENDED JUNE 30, 2019 ($ IN '000s)

	General	Safety	Total
Actuarial Present Value of Future Benefits			
• Present value of benefits for retired members and beneficiaries	$7,190,020	$3,132,387	$10,322,407
• Present value of benefits for inactive vested members[1]	439,348	79,651	518,999
• Present value of benefits for active members	6,296,041	2,814,791	9,110,832
Total Actuarial Present Value of Future Benefits	**$13,925,409**	**$6,026,829**	**$19,952,238**
Current and future assets			
• Total Valuation Value of Assets	$9,081,294	$3,850,950	$12,932,244
• Present value of future contributions by members	908,624	405,239	1,313,863
• Present value of future employer contributions for:			
» Entry age Normal Cost	1,130,829	552,434	1,683,263
» Unfunded Actuarial Accrued Liability	2,804,662	1,218,206	4,022,868
Total of current and future assets	**$13,925,409**	**$6,026,829**	**$19,952,238**

[1] Includes inactive members who choose to leave member contributions on deposit with less than five years of service.

I. Volatility Ratios

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

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

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

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

The LVR also indicates how volatile contributions will be in response to changes in the Actuarial Accrued Liability due to actual experience or to changes in actuarial assumptions. The current total plan LVR is about 12.5, but is 11.5 for General compared to 15.5 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 31, 2010 – 2019

Year Ended June 30	Asset Volatility Ratio			Liability Volatility Ratio		
	General	Safety	Total	General	Safety	Total
2010	5.8	7.8	6.3	8.4	11.6	9.1
2011	7.0	9.3	7.5	8.9	12.1	9.6
2012	7.5	10.0	8.1	9.7	12.9	10.4
2013	8.0	10.2	8.5	10.3	12.9	10.9
2014	8.6	10.7	9.1	10.2	12.6	10.8
2015	8.4	10.4	8.9	10.7	13.0	11.2
2016	8.0	10.1	8.5	11.1	14.4	11.9
2017	8.5	10.9	9.1	11.1	14.6	11.9
2018	8.8	11.7	9.5	11.2	15.3	12.2
2019	8.8	11.8	9.5	11.5	15.5	12.5

J. Risk Assessment

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

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 9.5% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.7% of payroll decrease/(increase) in the required contribution for each 1% asset gain or loss.

The single year market value rate of return over the last 10 years has ranged from a low of 0.48% to a high of 20.91%.

- 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 decreased from 84.3% to 76.3%. This is primarily due to the recognition of investment losses from 2008 and 2009 and the adoption of more conservative investment and mortality assumptions. 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 5.25%. This includes a high of a 7.91% return and a low of 1.53%. The average over the last 5 years was 6.31%. For more details see the Investment Return table in *Section 2, Subsection C* on page 25.
- The primary source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption changes in 2016 reduced the discount rate from 7.50% to 7.25% and updated mortality tables, adding $772 million in unfunded liability. The assumption changes in 2019 reduced the discount rate from 7.25% to 7.00% and again updated mortality tables, adding $435 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. A graphical representation of historical changes in UAAL by source will be included in the stand-alone risk assessment report.
- 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 72 and 73.

Maturity Measures

In the last 10 years the ratio of members in pay status to active participants has increased from 0.82 to 1.08. 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 15.

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 $61 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 19.

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.

Section 3: Supplemental Information

EXHIBIT A – TABLE OF PLAN COVERAGE
TOTAL PLAN

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	18,173	17,869	1.7%
• Average age	43.9	44.1	-0.2
• Average years of service	10.7	11.0	-0.3
• Total projected compensation	$1,359,311,226	$1,290,949,926	5.3%
• Average projected compensation	$74,798	$72,245	3.5%
• Account balances	$1,052,187,200	$951,844,909	10.5%
• Total active vested members	11,994	11,836	1.3%
Inactive vested members:			
• Number	6,151	5,928	3.8%
• Average age	45.9	46.2	-0.3
Retired members:			
• Number in pay status	15,596	15,018	3.8%
• Average age	69.6	69.4	0.2
• Average monthly benefit	$3,488	$3,372	3.4%
Disabled members:			
• Number in pay status	1,710	1,711	-0.1%
• Average age	65.0	64.5	0.5
• Average monthly benefit	$3,268	$3,121	4.7%
Beneficiaries:			
• Number in pay status	2,400	2,299	4.4%
• Average age	74.4	73.7	0.7
• Average monthly benefit	$1,939	$1,885	2.9%

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
GENERAL TOTAL

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	14,642	14,377	1.8%
• Average age	44.6	44.9	-0.3
• Average years of service	10.5	10.7	-0.2
• Total projected compensation	$1,033,275,290	$982,984,683	5.1%
• Average projected compensation	$70,569	$68,372	3.2%
• Account balances	$745,776,756	$681,642,872	9.4%
• Total active vested members	9,347	9,245	1.1%
Inactive vested members:			
• Number	5,488	5,281	3.9%
• Average age	46.2	46.6	-0.4
Retired members:			
• Number in pay status	13,360	12,900	3.6%
• Average age	70.5	70.3	0.2
• Average monthly benefit	$3,109	$3,003	3.5%
Disabled members:			
• Number in pay status	941	962	-2.2%
• Average age	67.3	66.6	0.7
• Average monthly benefit	$2,387	$2,308	3.4%
Beneficiaries:			
• Number in pay status	1,941	1,873	3.6%
• Average age	76.1	75.5	0.6
• Average monthly benefit	$1,723	$1,684	2.3%

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

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	20	22	-9.1%
• Average age	52.8	53.2	-0.4
• Average years of service	18.9	17.5	1.4
• Total projected compensation	$1,705,511	$1,730,030	-1.4%
• Average projected compensation	$85,276	$78,638	8.4%
• Account balances	$1,516,135	$1,395,553	8.6%
• Total active vested members	20	22	-9.1%
Inactive vested members:			
• Number	1,094	1,265	-13.5%
• Average age	55.8	55.2	0.6
Retired members:			
• Number in pay status	3,554	3,600	-1.3%
• Average age	74.9	74.9	0.0
• Average monthly benefit	$1,873	$1,881	-0.4%
Disabled members:			
• Number in pay status	156	167	-6.6%
• Average age	76.9	76.4	0.5
• Average monthly benefit	$2,459	$2,393	2.8%
Beneficiaries:			
• Number in pay status	1,031	1,017	1.4%
• Average age	81.5	81.2	0.3
• Average monthly benefit	$1,828	$1,797	1.7%

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
GENERAL TIER A

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	6,968	7,621	-8.6%
• Average age	51.0	50.6	0.4
• Average years of service	17.9	17.3	0.6
• Total projected compensation	$555,708,294	$584,973,839	-5.0%
• Average projected compensation	$79,751	$76,758	3.9%
• Account balances	$613,941,752	$582,091,427	5.5%
• Total active vested members	6,939	7,587	-8.5%
Inactive vested members:			
• Number	2,393	2,425	-1.3%
• Average age	47.4	47.0	0.4
Retired members:[1]			
• Number in pay status	9,760	9,273	5.3%
• Average age	68.9	68.6	0.3
• Average monthly benefit	$3,568	$3,443	3.6%
Disabled members:[1]			
• Number in pay status	781	791	-1.3%
• Average age	65.4	64.6	0.8
• Average monthly benefit	$2,376	$2,293	3.6%
Beneficiaries:[1]			
• Number in pay status	907	855	6.1%
• Average age	70.0	68.6	1.4
• Average monthly benefit	$1,608	$1,552	3.6%

[1] Include members from General Tier 2.

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
GENERAL TIER B

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	1,465	1,500	-2.3%
• Average age	43.2	42.4	0.8
• Average years of service	6.9	6.1	0.8
• Total projected compensation	$109,796,743	$106,016,029	3.6%
• Average projected compensation	$74,947	$70,677	6.0%
• Account balances	$53,170,133	$43,913,848	21.1%
• Total active vested members	1,285	1,294	-0.7%
Inactive vested members:			
• Number	565	511	10.6%
• Average age	42.8	41.8	1.0
Retired members:			
• Number in pay status	30	22	36.4%
• Average age	65.2	65.1	0.1
• Average monthly benefit	$1,763	$1,680	4.9%
Disabled members:			
• Number in pay status	4	4	0.0%
• Average age	51.8	50.8	1.0
• Average monthly benefit	$1,734	$1,700	2.0%
Beneficiaries:			
• Number in pay status	2	1	100.0%
• Average age	55.2	54.6	0.6
• Average monthly benefit	$239	$232	3.0%

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
GENERAL TIER C

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	4,865	5,234	-7.1%
• Average age	38.3	37.2	1.1
• Average years of service	3.5	2.5	1.0
• Total projected compensation	$290,757,627	$290,264,785	0.2%
• Average projected compensation	$59,765	$55,458	7.8%
• Account balances	$75,371,588	$54,242,045	39.0%
• Total active vested members	1,099	342	221.3%
Inactive vested members:			
• Number	1,343	1,080	24.4%
• Average age	38.2	37.9	0.3
Retired members:			
• Number in pay status	16	5	220.0%
• Average age	65.1	63.4	1.7
• Average monthly benefit	$522	$387	34.9%
Disabled members:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Beneficiaries:			
• Number in pay status	1	0	N/A
• Average age	54.3	N/A	N/A
• Average monthly benefit	$53	N/A	N/A

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
GENERAL TIER D

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	1,324	0	N/A
• Average age	35.6	N/A	N/A
• Average years of service	0.4	N/A	N/A
• Total projected compensation	$75,307,114	N/A	N/A
• Average projected compensation	$56,878	N/A	N/A
• Account balances	$1,777,148	N/A	N/A
• Total active vested members	4	0	N/A
Inactive vested members:			
• Number	93	0	N/A
• Average age	38.4	N/A	N/A
Retired members:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Disabled members:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Beneficiaries:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
SAFETY TOTAL

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	3,531	3,492	1.1%
• Average age	41.0	41.1	-0.1
• Average years of service	11.8	11.9	-0.1
• Total projected compensation	$326,035,935	$307,965,243	5.9%
• Average projected compensation	$92,335	$88,192	4.7%
• Account balances	$306,410,444	$270,202,036	13.4%
• Total active vested members	2,647	2,591	2.2%
Inactive vested members:			
• Number	663	647	2.5%
• Average age	42.9	43.0	-0.1
Retired members:			
• Number in pay status	2,236	2,118	5.6%
• Average age	64.0	63.7	0.3
• Average monthly benefit	$5,753	$5,622	2.3%
Disabled members:			
• Number in pay status	769	749	2.7%
• Average age	62.2	61.9	0.3
• Average monthly benefit	$4,347	$4,164	4.4%
Beneficiaries:			
• Number in pay status	459	426	7.7%
• Average age	67.4	65.7	1.7
• Average monthly benefit	$2,855	$2,769	3.1%

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

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	1,913	2,069	-7.5%
• Average age	46.3	45.7	0.6
• Average years of service	18.0	17.3	0.7
• Total projected compensation	$197,571,793	$201,285,042	-1.8%
• Average projected compensation	$103,279	$97,286	6.2%
• Account balances	$247,223,885	$226,581,368	9.1%
• Total active vested members	1,907	2,060	-7.4%
Inactive vested members:[1]			
• Number	452	477	-5.2%
• Average age	46.3	45.9	0.4
Retired members:[1]			
• Number in pay status	2,231	2,118	5.3%
• Average age	64.0	63.7	0.3
• Average monthly benefit	$5,763	$5,622	2.5%
Disabled members:[1]			
• Number in pay status	761	745	2.1%
• Average age	62.5	62.0	0.5
• Average monthly benefit	$4,363	$4,171	4.6%
Beneficiaries:[1]			
• Number in pay status	458	426	7.5%
• Average age	67.5	65.7	1.8
• Average monthly benefit	$2,859	$2,769	3.3%

[1] Include members from Safety Tier 1, Safety Tier 2 and Safety Tier A.

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

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	455	463	-1.7%
• Average age	38.0	36.9	1.1
• Average years of service	7.3	6.4	0.9
• Total projected compensation	$42,891,726	$39,527,839	8.5%
• Average projected compensation	$94,268	$85,373	10.4%
• Account balances	$23,900,994	$18,822,093	27.0%
• Total active vested members	406	410	-1.0%
Inactive vested members:			
• Number	92	80	15.0%
• Average age	38.0	37.2	0.8
Retired members:			
• Number in pay status	1	0	N/A
• Average age	50.1	N/A	N/A
• Average monthly benefit	$998	N/A	N/A
Disabled members:			
• Number in pay status	6	4	50.0%
• Average age	40.7	42.2	-1.5
• Average monthly benefit	$3,069	$2,910	5.5%
Beneficiaries:			
• Number in pay status	1	0	N/A
• Average age	32.5	N/A	N/A
• Average monthly benefit	$1,061	N/A	N/A

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

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	1,163	960	21.1%
• Average age	33.3	33.3	0.0
• Average years of service	3.3	3.0	0.3
• Total projected compensation	$85,572,417	$67,152,362	27.4%
• Average projected compensation	$73,579	$69,950	5.2%
• Account balances	$35,285,564	$24,798,575	42.3%
• Total active vested members	334	121	176.0%
Inactive vested members:			
• Number	119	90	32.2%
• Average age	33.9	33.0	0.9
Retired members:			
• Number in pay status	4	0	N/A
• Average age	60.2	N/A	N/A
• Average monthly benefit	$1,486	N/A	N/A
Disabled members:			
• Number in pay status	2	0	N/A
• Average age	31.0	N/A	N/A
• Average monthly benefit	$1,919	N/A	N/A
Beneficiaries:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	332	330	2	- -	- -	- -	- -	- -	- -	- -
	$49,661	$49,628	$55,007	- -	- -	- -	- -	- -	- -	- -
25 - 29	1,826	1,587	239	- -	- -	- -	- -	- -	- -	- -
	$58,040	$56,251	$69,917	- -	- -	- -	- -	- -	- -	- -
30 - 34	2,506	1,389	911	204	2	- -	- -	- -	- -	- -
	$67,522	$61,466	$73,912	$80,012	$88,067	- -	- -	- -	- -	- -
35 - 39	2,644	969	700	806	169	- -	- -	- -	- -	- -
	$74,113	$62,362	$75,198	$85,482	$82,774	- -	- -	- -	- -	- -
40 - 44	2,639	662	445	710	690	131	1	- -	- -	- -
	$78,790	$64,303	$73,117	$86,600	$85,193	$94,835	$129,978	- -	- -	- -
45 - 49	2,537	447	316	503	689	477	101	4	- -	- -
	$82,953	$66,100	$70,396	$82,052	$85,462	$100,104	$102,939	$89,546	- -	- -
50 - 54	2,221	327	233	387	471	383	323	95	2	- -
	$83,974	$67,866	$72,691	$79,892	$82,894	$98,172	$97,184	$87,026	$78,787	- -
55 - 59	1,950	294	222	317	391	265	283	159	19	- -
	$79,291	$68,539	$74,343	$76,362	$74,039	$83,708	$91,423	$96,396	$74,951	- -
60 - 64	1,084	138	146	202	251	150	118	63	11	5
	$73,849	$67,983	$71,806	$68,028	$71,940	$76,084	$81,180	$92,682	$106,213	$77,772
65 - 69	337	37	52	66	86	46	23	16	6	5
	$73,907	$65,201	$66,095	$79,390	$70,164	$89,192	$68,309	$84,222	$69,142	$69,421
70 & over	97	7	8	24	26	7	13	5	3	4
	$74,406	$68,980	$65,491	$76,783	$69,439	$104,321	$61,652	$82,230	$82,383	$93,078
Total	**18,173**	**6,187**	**3,274**	**3,219**	**2,775**	**1,459**	**862**	**342**	**41**	**14**
	$74,798	**$61,126**	**$73,140**	**$81,991**	**$81,341**	**$93,352**	**$92,508**	**$92,253**	**$83,219**	**$79,163**

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35 - 39	1	- -	- -	- -	1	- -	- -	- -	- -	- -
	$56,506	- -	- -	- -	$56,506	- -	- -	- -	- -	- -
40 - 44	1	- -	- -	- -	1	- -	- -	- -	- -	- -
	$93,705	- -	- -	- -	$93,705	- -	- -	- -	- -	- -
45 - 49	8	- -	- -	- -	6	2	- -	- -	- -	- -
	$100,245	- -	- -	- -	$87,393	$138,801	- -	- -	- -	- -
50 - 54	3	- -	- -	- -	2	1	- -	- -	- -	- -
	$102,020	- -	- -	- -	$122,502	$61,056	- -	- -	- -	- -
55 - 59	2	- -	- -	- -	2	- -	- -	- -	- -	- -
	$66,511	- -	- -	- -	$66,511	- -	- -	- -	- -	- -
60 - 64	1	- -	- -	- -	- -	1	- -	- -	- -	- -
	$57,203	- -	- -	- -	- -	$57,203	- -	- -	- -	- -
65 - 69	4	- -	- -	- -	4	- -	- -	- -	- -	- -
	$64,263	- -	- -	- -	$64,263	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**20**	**- -**	**- -**	**- -**	**16**	**4**	**- -**	**- -**	**- -**	**- -**
	$85,276	**- -**	**- -**	**- -**	**$81,853**	**$98,965**	**- -**	**- -**	**- -**	**- -**

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	107	- -	5	100	2	- -	- -	- -	- -	- -
	$65,757	- -	$64,190	$65,389	$88,067	- -	- -	- -	- -	- -
35 - 39	679	6	40	516	117	- -	- -	- -	- -	- -
	$77,540	$72,829	$66,419	$79,050	$74,925	- -	- -	- -	- -	- -
40 - 44	1,165	2	35	555	509	63	1	- -	- -	- -
	$82,162	$49,687	$65,194	$84,164	$81,239	$81,691	$129,978	- -	- -	- -
45 - 49	1,265	6	32	401	539	234	51	2	- -	- -
	$82,693	$67,448	$68,257	$79,131	$83,213	$90,144	$82,886	$56,886	- -	- -
50 - 54	1,369	7	23	340	403	285	230	79	2	- -
	$82,991	$65,688	$66,723	$77,353	$80,520	$93,518	$86,513	$78,003	$78,787	- -
55 - 59	1,298	4	24	284	350	232	240	146	18	- -
	$78,491	$56,887	$78,349	$74,170	$70,589	$80,495	$85,530	$92,572	$71,433	- -
60 - 64	769	3	19	195	236	134	111	56	11	4
	$73,665	$109,773	$72,379	$67,069	$70,833	$73,051	$79,358	$91,328	$106,213	$67,084
65 - 69	235	1	4	62	79	42	22	15	5	5
	$74,838	$92,224	$57,344	$75,997	$70,022	$88,053	$66,397	$81,437	$58,845	$69,421
70 & over	81	- -	1	23	25	7	13	5	3	4
	$73,643	- -	$97,649	$77,103	$61,271	$104,321	$61,652	$82,230	$82,383	$93,078
Total	**6,968**	**29**	**183**	**2,476**	**2,260**	**997**	**668**	**303**	**39**	**13**
	$79,751	**$70,688**	**$68,639**	**$77,827**	**$77,912**	**$86,043**	**$83,613**	**$87,586**	**$80,848**	**$75,981**

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	27	- -	27	- -	- -	- -	- -	- -	- -	- -
	$63,336	- -	$63,336	- -	- -	- -	- -	- -	- -	- -
30 - 34	328	32	289	7	- -	- -	- -	- -	- -	- -
	$72,206	$71,064	$72,486	$65,850	- -	- -	- -	- -	- -	- -
35 - 39	337	42	293	2	- -	- -	- -	- -	- -	- -
	$78,391	$77,648	$78,185	$124,195	- -	- -	- -	- -	- -	- -
40 - 44	241	36	200	5	- -	- -	- -	- -	- -	- -
	$76,134	$82,549	$75,558	$52,967	- -	- -	- -	- -	- -	- -
45 - 49	176	29	143	3	1	- -	- -	- -	- -	- -
	$75,074	$93,447	$71,631	$72,510	$42,352	- -	- -	- -	- -	- -
50 - 54	126	17	109	- -	- -	- -	- -	- -	- -	- -
	$76,782	$89,092	$74,862	- -	- -	- -	- -	- -	- -	- -
55 - 59	115	11	101	2	1	- -	- -	- -	- -	- -
	$77,345	$96,782	$73,424	$75,957	$262,319	- -	- -	- -	- -	- -
60 - 64	82	10	72	- -	- -	- -	- -	- -	- -	- -
	$68,941	$87,669	$66,339	- -	- -	- -	- -	- -	- -	- -
65 - 69	30	3	27	- -	- -	- -	- -	- -	- -	- -
	$69,043	$43,265	$71,907	- -	- -	- -	- -	- -	- -	- -
70 & over	3	- -	3	- -	- -	- -	- -	- -	- -	- -
	$43,522	- -	$43,522	- -	- -	- -	- -	- -	- -	- -
Total	**1,465**	**180**	**1,264**	**19**	**2**	**- -**	**- -**	**- -**	**- -**	**- -**
	$74,947	**$82,237**	**$73,850**	**$70,717**	**$152,335**	**- -**	**- -**	**- -**	**- -**	**- -**

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	113	112	1	- -	- -	- -	- -	- -	- -	- -
	$43,085	$43,123	$38,809	- -	- -	- -	- -	- -	- -	- -
25 - 29	970	885	85	- -	- -	- -	- -	- -	- -	- -
	$53,892	$53,517	$57,793	- -	- -	- -	- -	- -	- -	- -
30 - 34	1,208	894	314	- -	- -	- -	- -	- -	- -	- -
	$61,350	$60,096	$64,922	- -	- -	- -	- -	- -	- -	- -
35 - 39	862	635	226	1	- -	- -	- -	- -	- -	- -
	$61,944	$60,401	$66,302	$56,744	- -	- -	- -	- -	- -	- -
40 - 44	594	447	147	- -	- -	- -	- -	- -	- -	- -
	$63,011	$61,990	$66,117	- -	- -	- -	- -	- -	- -	- -
45 - 49	386	284	102	- -	- -	- -	- -	- -	- -	- -
	$60,306	$60,481	$59,819	- -	- -	- -	- -	- -	- -	- -
50 - 54	270	192	78	- -	- -	- -	- -	- -	- -	- -
	$62,089	$61,171	$64,348	- -	- -	- -	- -	- -	- -	- -
55 - 59	272	199	72	1	- -	- -	- -	- -	- -	- -
	$60,073	$59,346	$62,305	$43,930	- -	- -	- -	- -	- -	- -
60 - 64	130	90	40	- -	- -	- -	- -	- -	- -	- -
	$63,597	$62,303	$66,510	- -	- -	- -	- -	- -	- -	- -
65 - 69	50	29	20	1	- -	- -	- -	- -	- -	- -
	$66,944	$69,520	$60,348	$124,180	- -	- -	- -	- -	- -	- -
70 & over	10	6	4	- -	- -	- -	- -	- -	- -	- -
	$68,181	$64,350	$73,928	- -	- -	- -	- -	- -	- -	- -
Total	**4,865**	**3,773**	**1,089**	**3**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$59,765	**$58,501**	**$64,105**	**$74,951**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	126	126	- -	- -	- -	- -	- -	- -	- -	- -
	$46,885	$46,885	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	370	370	- -	- -	- -	- -	- -	- -	- -	- -
	$54,050	$54,050	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	269	267	2	- -	- -	- -	- -	- -	- -	- -
	$58,939	$58,871	$67,951	- -	- -	- -	- -	- -	- -	- -
35 - 39	186	186	- -	- -	- -	- -	- -	- -	- -	- -
	$57,669	$57,669	- -	- -	- -	- -	- -	- -	- -	- -
40 - 44	130	129	1	- -	- -	- -	- -	- -	- -	- -
	$62,035	$62,021	$63,898	- -	- -	- -	- -	- -	- -	- -
45 - 49	90	90	- -	- -	- -	- -	- -	- -	- -	- -
	$61,804	$61,804	- -	- -	- -	- -	- -	- -	- -	- -
50 - 54	75	75	- -	- -	- -	- -	- -	- -	- -	- -
	$57,787	$57,787	- -	- -	- -	- -	- -	- -	- -	- -
55 - 59	46	46	- -	- -	- -	- -	- -	- -	- -	- -
	$64,411	$64,411	- -	- -	- -	- -	- -	- -	- -	- -
60 - 64	27	27	- -	- -	- -	- -	- -	- -	- -	- -
	$60,186	$60,186	- -	- -	- -	- -	- -	- -	- -	- -
65 - 69	4	4	- -	- -	- -	- -	- -	- -	- -	- -
	$43,583	$43,584	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	1	1	- -	- -	- -	- -	- -	- -	- -	- -
	$96,763	$96,763	- -	- -	- -	- -	- -	- -	- -	- -
Total	**1,324**	**1,321**	**3**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$56,878	**$56,856**	**$66,600**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	94	- -	2	92	- -	- -	- -	- -	- -	- -
	$96,362	- -	$69,968	$96,936	- -	- -	- -	- -	- -	- -
35 - 39	335	- -	4	282	49	- -	- -	- -	- -	- -
	$97,688	- -	$83,195	$97,034	$102,633	- -	- -	- -	- -	- -
40 - 44	398	1	2	149	178	68	- -	- -	- -	- -
	$98,586	$125,210	$86,189	$96,956	$96,721	$107,012	- -	- -	- -	- -
45 - 49	537	4	3	96	142	240	50	2	- -	- -
	$104,303	$143,331	$97,780	$94,185	$94,279	$109,586	$123,393	$122,205	- -	- -
50 - 54	321	- -	3	47	65	97	93	16	- -	- -
	$111,030	- -	$101,563	$98,259	$95,907	$112,229	$123,574	$131,579	- -	- -
55 - 59	161	1	2	30	38	33	43	13	1	- -
	$111,554	$132,806	$114,945	$98,226	$101,255	$106,297	$124,313	$139,347	$138,266	- -
60 - 64	52	- -	- -	7	15	15	7	7	- -	1
	$99,724	- -	- -	$94,741	$89,351	$104,439	$110,071	$103,514	- -	$120,524
65 - 69	13	- -	- -	3	3	4	1	1	1	- -
	$108,516	- -	- -	$134,587	$81,770	$101,155	$110,380	$126,005	$120,628	- -
70 & over	2	- -	- -	1	1	- -	- -	- -	- -	- -
	$171,538	- -	- -	$69,433	$273,644	- -	- -	- -	- -	- -
Total	**1,913**	**6**	**16**	**707**	**491**	**457**	**194**	**39**	**2**	**1**
	$103,279	**$138,557**	**$92,063**	**$96,848**	**$96,892**	**$109,284**	**$123,136**	**$128,508**	**$129,447**	**$120,524**

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	42	1	41	- -	- -	- -	- -	- -	- -	- -
	$86,288	$110,454	$85,698	- -	- -	- -	- -	- -	- -	- -
30 - 34	174	10	159	5	- -	- -	- -	- -	- -	- -
	$90,972	$111,279	$90,010	$80,923	- -	- -	- -	- -	- -	- -
35 - 39	109	14	88	5	2	- -	- -	- -	- -	- -
	$93,880	$118,921	$90,803	$88,076	$68,496	- -	- -	- -	- -	- -
40 - 44	45	8	34	1	2	- -	- -	- -	- -	- -
	$97,702	$121,996	$95,136	$63,673	$61,148	- -	- -	- -	- -	- -
45 - 49	34	7	22	3	1	1	- -	- -	- -	- -
	$103,404	$115,594	$103,203	$93,811	$77,213	$77,477	- -	- -	- -	- -
50 - 54	19	5	13	- -	1	- -	- -	- -	- -	- -
	$104,282	$113,869	$99,812	- -	$114,452	- -	- -	- -	- -	- -
55 - 59	21	3	18	- -	- -	- -	- -	- -	- -	- -
	$103,645	$79,187	$107,722	- -	- -	- -	- -	- -	- -	- -
60 - 64	11	1	10	- -	- -	- -	- -	- -	- -	- -
	$103,218	$116,530	$101,887	- -	- -	- -	- -	- -	- -	- -
65 - 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**455**	**49**	**385**	**14**	**6**	**1**	**- -**	**- -**	**- -**	**- -**
	$94,268	**$114,218**	**$92,407**	**$85,007**	**$75,159**	**$77,477**	**- -**	**- -**	**- -**	**- -**

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

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	93	92	1	- -	- -	- -	- -	- -	- -	- -
	$61,411	$61,304	$71,203	- -	- -	- -	- -	- -	- -	- -
25 - 29	417	331	86	- -	- -	- -	- -	- -	- -	- -
	$68,041	$65,858	$76,441	- -	- -	- -	- -	- -	- -	- -
30 - 34	326	186	140	- -	- -	- -	- -	- -	- -	- -
	$72,507	$67,449	$79,227	- -	- -	- -	- -	- -	- -	- -
35 - 39	135	86	49	- -	- -	- -	- -	- -	- -	- -
	$72,227	$69,587	$76,862	- -	- -	- -	- -	- -	- -	- -
40 - 44	65	39	26	- -	- -	- -	- -	- -	- -	- -
	$71,379	$68,874	$75,136	- -	- -	- -	- -	- -	- -	- -
45 - 49	41	27	14	- -	- -	- -	- -	- -	- -	- -
	$84,461	$85,580	$82,302	- -	- -	- -	- -	- -	- -	- -
50 - 54	38	31	7	- -	- -	- -	- -	- -	- -	- -
	$110,284	$115,152	$88,728	- -	- -	- -	- -	- -	- -	- -
55 - 59	35	30	5	- -	- -	- -	- -	- -	- -	- -
	$121,951	$123,841	$110,612	- -	- -	- -	- -	- -	- -	- -
60 - 64	12	7	5	- -	- -	- -	- -	- -	- -	- -
	$123,301	$118,117	$130,558	- -	- -	- -	- -	- -	- -	- -
65 - 69	1	- -	1	- -	- -	- -	- -	- -	- -	- -
	$59,124	- -	$59,124	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**1,163**	**829**	**334**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$73,579	**$71,264**	**$79,326**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

EXHIBIT C – RECONCILIATION OF MEMBER DATA

	Active Members	Inactive Vested Members[1]	Retired Members	Disableds	Beneficiaries	Total
Number as of June 30, 2018	**17,869**	**5,928**	**15,018**	**1,711**	**2,299**	**42,825**
• New members	1,666	134	N/A	N/A	198	1,998
• Terminations	(573)	573	N/A	N/A	N/A	0
• Contribution refunds	(130)	(116)	N/A	N/A	N/A	(246)
• Retirements	(684)	(224)	908	N/A	N/A	0
• New disabilities	(24)	(2)	(15)	41	N/A	0
• Return to work	63	(59)	(4)	0	N/A	0
• Died with or without beneficiary	(14)	(17)	(314)	(40)	(94)	(479)
• Data adjustments[2]	0	(66)	3	(2)	(3)	(68)
Number as of June 30, 2019	**18,173**	**6,151**	**15,596**	**1,710**	**2,400**	**44,030**

(1) Includes inactive members who choose to leave member contributions on deposit with less than five years of service.

(2) Includes classifying 55 inactive vested members who were ineligible to receive a benefit.

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

	Year Ended June 30, 2019		Year Ended June 30, 2018	
Net assets at market value at the beginning of the year		**$12,288,915,042**		**$11,407,677,542**
Contribution income:				
• Employer contributions	$552,718,537		$544,124,298	
• Member contributions	145,745,717		140,401,589	
Net contribution income		$698,464,254		$684,525,887
Investment income:				
• Interest, dividends, asset appreciation and other income	$745,041,782		$1,002,063,782	
• Less investment and administrative fees	(89,862,936)		(98,535,964)	
Net investment income		$655,178,846		$903,527,818
Total income available for benefits		**$1,353,643,100**		**$1,588,053,705**
Less benefit payments:				
• Service retirement and disability benefits	$(737,124,015)		$(682,497,863)	
• Death benefits	(1,442,595)		(1,624,326)	
• Health benefits	(16,160,878)		(16,878,245)	
• Supplemental retirement benefits	0		(1,427,104)	
• Member refunds	(5,297,001)		(4,388,667)	
Net benefit payments		$(760,024,489)		$(706,816,205)
Change in net assets at market value		**$593,618,611**		**$881,237,500**
Net assets at market value at the end of the year		**$12,882,533,653**		**$12,288,915,042**

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		$1,691,161,452		$1,114,541,416
Accounts receivable:				
• Contributions	$4,192,241		$12,076,024	
• Accrued interest and dividends	29,043,626		27,524,807	
• Settlement of securities sold	433,374,154		291,522,417	
Total accounts receivable		$466,610,021		$331,123,248
Investments:				
• Domestic equity securities	$1,564,743,227		$1,508,343,648	
• International equity securities	1,158,026,798		1,249,438,706	
• Bonds	5,527,854,911		5,286,930,566	
• Securities lending collateral	20,930,341		41,117,658	
• Real estate	1,052,241,563		971,551,477	
• Private equity	790,260,651		827,273,677	
• Private real assets	694,942,257		786,823,161	
• Opportunistic	479,909,007		674,392,554	
• Cash and securities for swaps	46,328,705		(46,320,352)	
• Other investments	6,603,306		8,004,622	
Total investments at market value		$11,341,840,766		$11,307,555,717
Total assets		$13,499,612,239		$12,753,220,381
Accounts payable:				
• Securities lending & settlement of securities purchased	$(583,910,839)		$(442,349,675)	
• Professional service	(14,267,767)		(9,332,486)	
• Cash in transit	(94,293)		(94,293)	
• Others	(18,805,687)		(12,528,885)	
Total accounts payable		$(617,078,586)		$(464,305,339)
Net assets at market value		**$12,882,533,653**		**$12,288,915,042**
Net assets at actuarial value		**$12,951,855,934**		**$12,380,093,828**
Net assets at valuation value		**$12,932,243,936**		**$12,365,656,043**

Note: Results may be slightly off due to rounding.

EXHIBIT F – SUMMARY OF REPORTED RESERVE INFORMATION

	June 30, 2019 ($ in '000s)	June 30, 2018 ($ in '000s)
Used in Development of Valuation Value of Assets:		
• Member contributions reserve	$1,437,562	$1,232,177
• County contributions reserve	3,943,776	3,240,204
• Retired member reserve	6,624,162	7,011,660
• Transition reserve	926,744	881,615
Subtotal: Valuation Value of Assets	$12,932,244	$12,365,656
Not Used in Development of Valuation Value of Assets:		
• Supplemental benefit and disability supplemental benefit reserves	$0	$0
• 401(h) health reserve	19,612	14,436
• Undistributed reserve	0	0
• Contingency reserve	0	1
Subtotal	$19,612	$14,437
Subtotal: Actuarial Value of Assets	$12,951,856	$12,380,094
• Net deferred gains (losses)	(69,322)	(91,179)
Total: Gross Market Value of Assets	**$12,882,534**	**$12,288,915**

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	Net Investment Return[1]	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	$276,686,000	$46,416,000	$820,376,000	$457,266,000	$6,878,165,000	$8,433,310,000	122.61%
2011	321,837,000	43,994,000	1,425,637,000	486,764,000	8,182,869,000	8,542,291,000	104.39%
2012	354,008,000	59,778,000	443,667,000	519,819,000	8,520,503,000	8,607,483,000	101.02%
2013	376,918,000	71,718,000	658,746,000	563,691,000	9,064,194,000	9,186,032,000	101.34%
2014	414,906,000	78,920,000	1,208,144,000	580,726,000	10,185,438,000	9,824,431,000	96.46%
2015	435,882,000	98,590,000	228,595,000	611,605,000	10,336,900,000	10,535,337,000	101.92%
2016	425,306,000	104,636,000	49,754,000	647,538,000	10,269,058,000	11,030,635,000	107.42%
2017	459,236,000	112,579,000	1,235,025,000	668,220,000	11,407,678,000	11,566,927,000	101.40%
2018	544,124,000	140,401,000	903,528,000	706,816,000	12,288,915,000	12,365,656,000	100.62%
2019	552,718,000	145,746,000	655,179,000	760,024,000	12,882,534,000	12,932,244,000	100.39%

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

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)
General						
June 30, 2004	Reamortize UAAL	$898,323	20	$521,875	6[1]	$98,455
June 30, 2005	Actuarial loss	128,924	20	84,797	6[1]	15,997
June 30, 2006	Actuarial gain	(122,837)	20	(88,808)	6[1]	(16,754)
June 30, 2007	Actuarial gain	(319,377)	20	(248,660)	6[1]	(46,911)
June 30, 2008	Actuarial gain	(252,322)	20	(208,280)	6[1]	(39,293)
June 30, 2009	Actuarial loss	229,764	20	198,616	6[1]	37,470
June 30, 2010	Actuarial loss	275,738	20	247,147	6[1]	46,626
June 30, 2010	Assumption change	273,446	20	245,094	11	27,450
June 30, 2011	Actuarial loss	272,855	20	251,735	12	26,277
June 30, 2012	Actuarial loss	331,062	20	312,244	13	30,588
June 30, 2012	Assumption change	(23,270)	20	(21,947)	13	(2,150)
June 30, 2013	Actuarial gain	(111,526)	20	(106,906)	14	(9,885)
June 30, 2013	Assumption change	284,375	20	272,595	14	25,206
June 30, 2014	Actuarial gain	(92,909)	20	(90,279)	15	(7,920)
June 30, 2015	Actuarial gain	(25,009)	20	(24,526)	16	(2,050)
June 30, 2015	Assumption change	221,787	20	217,500	16	18,179
June 30, 2016	Actuarial loss	39,919	20	39,452	17	3,154
June 30, 2016	Assumption change	445,570	20	440,366	17	35,204
June 30, 2017	Actuarial loss	90,516	20	90,070	18	6,910
June 30, 2018	Actuarial loss	84,518	20	84,422	19	6,234
June 30, 2019	Actuarial loss	208,437	20	208,437	20	14,855
June 30, 2019	Assumption change	379,718	20	379,718	20	27,062
General Subtotal				**$2,804,662**		**$294,704**

[1] Reflects the adjustment to UAAL amortization periods made in 2019.

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)
Safety						
June 30, 2004	Reamortize UAAL	$304,408	20	$176,843	6[1]	$33,362
June 30, 2005	Actuarial loss	40,271	20	26,486	6[1]	4,997
June 30, 2006	Actuarial gain	(29,564)	20	(21,373)	6[1]	(4,032)
June 30, 2007	Actuarial gain	(81,955)	20	(63,809)	6[1]	(12,038)
June 30, 2008	Actuarial gain	(88,653)	20	(73,178)	6[1]	(13,805)
June 30, 2009	Actuarial loss	82,198	20	71,053	6[1]	13,405
June 30, 2010	Actuarial loss	103,299	20	92,590	6[1]	17,468
June 30, 2010	Assumption change	140,579	20	126,004	11	14,112
June 30, 2011	Actuarial loss	114,781	20	105,895	12	11,054
June 30, 2012	Actuarial loss	98,453	20	92,857	13	9,096
June 30, 2012	Assumption change	6,803	20	6,416	13	628
June 30, 2013	Actuarial gain	(18,694)	20	(17,919)	14	(1,657)
June 30, 2013	Assumption change	(20,621)	20	(19,767)	14	(1,828)
June 30, 2014	Actuarial loss	4,218	20	4,099	15	360
June 30, 2015	Actuarial gain	(14,992)	20	(14,702)	16	(1,229)
June 30, 2015	Assumption change	98,607	20	96,701	16	8,083
June 30, 2016	Actuarial loss	32,578	20	32,198	17	2,574
June 30, 2016	Assumption change	326,213	20	322,404	17	25,774
June 30, 2017	Actuarial loss	54,268	20	54,000	18	4,143
June 30, 2018	Actuarial loss	52,916	20	52,856	19	3,903
June 30, 2019	Actuarial loss	113,295	20	113,295	20	8,074
June 30, 2019	Assumption change	55,257	20	55,257	20	3,938
Safety Subtotal				**$1,218,206**		**$126,382**

[1] Reflects the adjustment to UAAL amortization periods made in 2019.

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)
Total						
June 30, 2004	Reamortize UAAL	$1,202,731	20	$698,718	6[1]	$131,817
June 30, 2005	Actuarial loss	169,195	20	111,283	6[1]	20,994
June 30, 2006	Actuarial gain	(152,401)	20	(110,181)	6[1]	(20,786)
June 30, 2007	Actuarial gain	(401,332)	20	(312,469)	6[1]	(58,949)
June 30, 2008	Actuarial gain	(340,975)	20	(281,458)	6[1]	(53,098)
June 30, 2009	Actuarial loss	311,962	20	269,669	6[1]	50,875
June 30, 2010	Actuarial loss	379,037	20	339,737	6[1]	64,094
June 30, 2010	Assumption change	414,025	20	371,098	11	41,562
June 30, 2011	Actuarial loss	387,636	20	357,630	12	37,331
June 30, 2012	Actuarial loss	429,515	20	405,101	13	39,684
June 30, 2012	Assumption change	(16,467)	20	(15,531)	13	(1,522)
June 30, 2013	Actuarial gain	(130,220)	20	(124,825)	14	(11,542)
June 30, 2013	Assumption change	263,754	20	252,828	14	23,378
June 30, 2014	Actuarial gain	(88,691)	20	(86,180)	15	(7,560)
June 30, 2015	Actuarial gain	(40,001)	20	(39,228)	16	(3,279)
June 30, 2015	Assumption change	320,394	20	314,201	16	26,262
June 30, 2016	Actuarial loss	72,497	20	71,650	17	5,728
June 30, 2016	Assumption change	771,783	20	762,770	17	60,978
June 30, 2017	Actuarial loss	144,784	20	144,070	18	11,053
June 30, 2018	Actuarial loss	137,434	20	137,278	19	10,137
June 30, 2019	Actuarial loss	321,732	20	321,732	20	22,929
June 30, 2019	Assumption change	434,975	20	434,975	20	31,000
Total				**$4,022,868**		**$421,086**

[1] Reflects the adjustment to UAAL amortization periods made in 2019.

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:

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

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

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

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

Section 4: Actuarial Valuation Basis

EXHIBIT I – ACTUARIAL ASSUMPTIONS AND METHODS

Rationale for Assumptions	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the July 1, 2015 through June 30, 2018 Actuarial Experience Study dated April 5, 2019. Unless otherwise noted, all actuarial assumptions and methods shown below apply to members for all tiers. These assumptions were adopted by the Board.
Economic Assumptions	
Net Investment Return:	7.00%; net of administrative and investment expenses. Based on the Actuarial Experience Study reference above, expected administrative and investment expenses represent about 0.80% of the Actuarial Value of Assets.
Member Contribution Crediting Rate:	One-half of the net investment return credited semi-annually.
Consumer Price Index:	Increase of 2.75% per year, retiree COLA increases due to CPI subject to a 3% maximum change per year for Tier 1 and Tier A, and 2% maximum change per year for Tier B, Tier C and Tier D. For member that have COLA banks, we have reflected those amounts in projecting their future COLAs.
Payroll Growth:	Inflation of 2.75% per year plus “across the board” real salary increases of 0.50% per year.
Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 2.75% per year from the valuation date.
Increase in Section 7522.10 Compensation Limit:	Increase of 2.75% per year from the valuation date.

Salary Increases:

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:

Merit and Promotion Increases		
Years of Service	Rate (%)	
	General	Safety
Less than 1	7.25	8.75
1-2	5.50	6.25
2-3	5.00	5.00
3-4	4.25	4.60
4-5	3.00	4.50
5-6	2.50	2.75
6-7	2.00	2.40
7-8	1.75	1.75
8-9	1.50	1.50
9-10	1.40	1.40
10-11	1.30	1.30
11-12	1.20	1.20
12-13	1.10	1.15
13-14	1.00	1.10
14-15	0.95	1.05
15 & Over	0.90	1.00

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 100% for males and 105% for females, 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) times 105% for males and 95% for 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) times 75% for males and 75% for 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) times 100% for males and 100% for 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) times 100% for males and 100% for 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) times 100% for males and 100% for females, projected generationally with the two-dimensional mortality improvement scale MP-2018.

	Rate (%)			
	General[1]		Safety[1]	
Age	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 General pre-retirement deaths are assumed to be non-service connected. All Safety pre-retirement deaths are assumed to be service connected.

(1) 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 100% for males and 105% for females, projected 30 years with the two-dimensional mortality improvement scale MP-2018, weighted 30% male and 70% female.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) times 105% for males and 95% for females, projected 30 years with the two-dimensional mortality improvement scale MP-2018, weighted 75% male and 25% female.

Disability Incidence Rates:

Disability Incidence		
	Rate (%)	
Age	General	Safety
20	0.00	0.02
25	0.01	0.07
30	0.03	0.19
35	0.05	0.37
40	0.13	0.48
45	0.20	0.62
50	0.24	1.06
55	0.31	1.42
60	0.41	1.68
65	0.48	1.92
70	0.56	1.70
75	0.60	1.50

70% of General disabilities are assumed to be service connected disabilities and the other 30% are assumed to be non-service connected disabilities.

90% of Safety disabilities are assumed to be service connected disabilities and the other 10% are assumed to be non-service connected disabilities.

Termination Rates:

Termination		
Years of Service	Rate (%)	
	General	Safety
Less than 1	12.00	7.50
1-2	8.25	5.75
2-3	7.00	4.25
3-4	5.50	3.25
4-5	5.50	3.00
5-6	5.25	2.75
6-7	4.50	2.50
7-8	4.25	2.50
8-9	3.75	2.25
9-10	3.50	2.00
10-11	3.25	1.75
11-12	3.00	1.50
12-13	2.75	1.25
13-14	2.50	1.00
14-15	2.25	0.90
15-16	2.00	0.80
16-17	1.75	0.70
17-18	1.70	0.60
18-19	1.65	0.50
19-20	1.60	0.50
20 & Over	1.50	0.50

The greater of a refund of member contributions and a deferred annuity is valued when a member terminates.

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

Retirement Rates:

Age	Retirement Rates (%)				
	General Tiers 1 and A (Less than 30 Years of Service)	General Tiers 1 and A (30 or More Years of Service)	General Tier B	General Tier C	General Tier D
49	0.0	75.0	0.0	0.0	0.0
50	4.0	10.0	0.0	0.0	0.0
51	4.0	10.0	0.0	0.0	0.0
52	4.0	10.0	0.0	4.0	3.0
53	5.0	10.0	0.0	4.0	3.0
54	6.0	14.0	0.0	4.0	3.0
55	8.0	16.0	5.0	4.0	3.0
56	9.0	18.0	6.0	4.5	4.0
57	9.0	20.0	7.0	5.5	5.0
58	9.0	20.0	7.0	5.5	5.0
59	11.0	24.0	7.0	5.5	6.0
60	16.0	24.0	9.0	7.0	9.0
61	18.0	25.0	13.0	10.0	12.0
62	20.0	26.0	18.0	14.0	15.0
63	22.0	27.0	18.0	14.0	17.0
64	22.0	28.0	18.0	14.0	19.0
65	32.0	32.0	30.0	26.0	23.0
66	35.0	35.0	30.0	30.0	26.0
67	35.0	35.0	30.0	30.0	26.0
68	35.0	35.0	30.0	30.0	26.0
69	30.0	30.0	30.0	30.0	26.0
70	30.0	30.0	30.0	30.0	30.0
71	25.0	25.0	25.0	25.0	25.0
72	25.0	25.0	25.0	25.0	25.0
73	25.0	25.0	25.0	25.0	25.0
74	25.0	25.0	25.0	25.0	25.0
75 & Over	100.0	100.0	100.0	100.0	100.0

Retirement Rates (continued):

Age	Retirement Rates (%)				
	Safety Tier A (Less than 30 Years of Service)	Safety Tier A (30 or More Years of Service)	Safety Tier B	Safety Tier C	Safety Tier D
41	6.0	0.0	6.0	0.0	0.0
42	6.0	0.0	6.0	0.0	0.0
43	6.0	0.0	6.0	0.0	0.0
44	2.0	0.0	2.0	0.0	0.0
45	2.0	0.0	2.0	0.0	0.0
46	2.0	0.0	2.0	0.0	0.0
47	3.0	0.0	3.0	0.0	0.0
48	4.0	4.0	4.0	0.0	0.0
49	11.0	11.0	4.5	0.0	0.0
50	15.0	37.5	11.5	15.0	15.0
51	15.0	37.5	11.0	9.5	9.5
52	15.0	37.5	11.0	10.5	10.5
53	15.0	37.5	11.0	10.5	10.5
54	15.0	37.5	12.5	11.0	11.0
55	15.0	30.0	19.0	16.5	15.0
56	15.0	32.0	22.5	20.0	18.0
57	15.0	32.0	20.0	20.0	18.0
58	15.0	32.0	20.0	20.0	18.0
59	15.0	32.0	20.0	22.0	20.0
60	22.0	33.0	22.0	22.0	20.0
61	25.0	37.5	26.0	26.0	26.0
62	25.0	37.5	26.0	26.0	26.0
63	25.0	37.5	26.0	26.0	26.0
64	28.0	42.0	30.0	30.0	30.0
65	50.0	75.0	50.0	50.0	50.0
66	50.0	75.0	50.0	50.0	50.0
67	50.0	75.0	50.0	50.0	50.0
68	50.0	75.0	50.0	50.0	50.0
69	50.0	75.0	50.0	50.0	50.0
70 & Over	100.0	100.0	100.0	100.0	100.0

Retirement Age and Benefit for Deferred Vested Members:	General Retirement Age Reciprocal members: 60 Other members: 57 Safety Retirement Age Reciprocal members: 53 Other members: 50 Future deferred vested members who terminate with less than five years of service and are not vested are assumed to retire at age 70 for both General and Safety if they decide to leave their contributions on deposit. 20% of future General and 30% of future Safety deferred vested members are assumed to continue to work for a reciprocal employer. For reciprocals, 4.15% and 4.25% compensation increases are assumed per annum for General and Safety members, respectively.
Future Benefit Accruals:	1.0 year of service per year of employment.
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be female.
Definition of Active Members:	First day of pay period following employment.
Form of Payment:	All active and inactive members are assumed to elect the unmodified option at retirement.
Percent Married:	For all active and inactive members, 70% of male members and 55% of female members are assumed to be married at pre-retirement death or retirement.
Age and Gender of Spouse:	For all active and inactive members, male members are assumed to have a female spouse who is 3 years younger than the member and female members are assumed to have a male spouse who is 2 years older than the member.
Service Converted from Unused Sick Leave:	The following assumptions for service converted from unused sick leave as a percentage of service at retirement are used: General members: 1.00% Safety members: 1.50% Pursuant to Section 31641.02, the cost of this benefit for Tiers 1, A and B members will be charged only to employers and will not affect member contribution rates.

Actuarial Funding Policy	
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is the age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation.
Actuarial Value of Assets:	Market value of assets (MVA) less unrecognized returns in each of the last 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.
Valuation Value of Assets:	The actuarial value of assets reduced by the following non-valuation reserves and designations: (1) 401(h) Health Benefit Reserve; (2) Undistributed Reserve; (3) Contingency Reserve; (4) Supplemental Benefit Reserve; and (5) Disability Supplemental Benefit Reserve.
Amortization Policy:	The UAAL, (i.e., the difference between the Actuarial Accrued Liability and the Valuation Value of Assets), as of June 30, 2012 shall continue to be amortized over separate 20-year period amortization layers based on the valuations during which each separate layer was previously established. 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, 2013 and later will be amortized over a period of 20 years. Any new UAAL as a result of plan amendments will be amortized over a period of 15 years. 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. 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. 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. 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 20 years as the first of a new series of amortization layers.

Other Actuarial Methods	
Employer Contributions:	Employer contributions consist of two components: *Normal Cost* The annual contribution rate that, if paid annually from a member's first year of membership through the year of retirement, would accumulate to the amount necessary to fully fund the member's retirement-related benefits. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution rate is determined as a level percentage of the member's compensation. *Contribution to the Unfunded Actuarial Accrued Liability (UAAL)* The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution (or rate credit in the case of a negative UAAL) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the 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). The amortization policy is described on the previous page. The recommended employer contributions are provided in *Section 2, Subsection F.*
Member Contributions:	**Non-Tier C and Non-Tier D Members (i.e., Non-CalPEPRA)** 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 C and non-Tier D 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 1/100 of Final Average Compensation for General and Safety members. A One-Year Final Average Compensation is used for General Tier 1, General Tier A and Safety Tier A. A Three-Year Final Average Compensation is used for General Tier B and Safety Tier B. That age is 60 for General Tier 1 and Tier B members, 55 for General Tier A members and 50 for Safety Tier A and Tier B members. It is assumed that contributions are made annually at the same rate, starting at entry age. In addition to their basic contributions, members pay one-half of the total normal cost necessary to fund their cost-of-living benefits. Accumulation includes semi-annual crediting of interest at half of the assumed investment earning rate. Please note that the member rates provided in the report are the full rate before reflecting any employer pickup, if any.

	Tier C and Tier D Members (i.e., CalPEPRA) Pursuant to Section 7522.30(a) of the Government Code, Tier C and Tier D 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 C and Tier D members and we have not taken into account the requirements of Section 7522.30(e). The member contribution rates for all members are provided in *Section 4, Exhibit III*.
Internal Revenue Code Section 415:	Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual's account in a defined contribution plan. A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active participants could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan's assets. In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar limit of $160,000 indexed for inflation. That limit is $225,000 for 2019. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must be adjusted based on each participant's circumstances, for such things as age at retirement, form of benefits chosen and after tax contributions. Non-CalPEPRA benefits in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m). Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard. Section 415(b) limit have been applied to the benefit data for members in pay status provided by SDCERA for valuation purposes. 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.
Changed Actuarial Assumptions:	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:
Net Investment Return:	7.25%; net of administrative and investment expenses.
Consumer Price Index:	Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 3% maximum change per year for Tier 1 and Tier A, and 2% maximum change per year for Tier B, Tier C and Tier D.
Payroll Growth:	Inflation of 3.00% per year plus "across the board" real salary increases of 0.50% per year.

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 (continued):
Increase in Section 7522.10 Compensation Limit:	Increase of 3.00% per year from the valuation date.
Salary Increases:	The annual rate of compensation increase includes: inflation at 3.00%, plus "across the board" salary increases of 0.50% per year, plus the following merit and promotion increases:

Merit and Promotion Increases		
Years of Service	Rate (%)	
	General	Safety
Less than 1	6.75	8.50
1-2	5.00	6.25
2-3	4.50	5.00
3-4	3.50	4.75
4-5	2.50	4.50
5-6	1.50	2.25
6-7	1.40	1.60
7-8	1.30	1.40
8-9	1.20	1.20
9-10	1.10	1.10
10-11	1.00	1.00
11-12	0.95	1.00
12-13	0.90	1.00
13-14	0.85	1.00
14-15	0.80	1.00
15 & Over	0.75	1.00

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 (continued):
Post-Retirement Mortality Rates:	*Healthy* • **General Members and All Beneficiaries:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015, set forward one year for females. • **Safety Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015, set back two years. *Disabled* • **General Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015, set forward five years for males and four years for females. • **Safety Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015, set forward one year.
Pre-Retirement Mortality Rates:	• **General and Safety Members:** Headcount-Weighted RP-2014 Employee Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015 times 75%.

	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

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

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 (continued):
Mortality Rates for Member Contributions:	• **General Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015, set forward one year for females weighted 30% male and 70% female • **Safety Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015, set back two years weighted 75% male and 25% female.
Disability Incidence:	

Disability Incidence				
	Rate (%)			
	Non Service Connected Disability		Service Connected Disability	
Age	General	Safety	General	Safety
20	0.00	0.00	0.00	0.03
25	0.00	0.00	0.01	0.08
30	0.01	0.00	0.03	0.18
35	0.02	0.05	0.04	0.33
40	0.05	0.08	0.06	0.52
45	0.09	0.08	0.13	0.63
50	0.11	0.08	0.17	1.22
55	0.14	0.10	0.26	1.84
60	0.17	0.12	0.31	2.30
65	0.22	0.05	0.23	2.50

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 (continued):

Termination:

Termination (< 5 Years of Service)		
Years of Service	Rate (%)	
	General	Safety
Less than 1	11.75	9.00
1 – 2	8.50	7.00
2 – 3	7.00	4.00
3 – 4	5.75	3.00
4 – 5	5.50	2.90

For those with less than 5 years of service, 65% of all terminating members will choose a refund of contributions and 35% will choose a deferred vested benefit.

Termination (5+ Years of Service)		
	Rate (%)	
Age	General	Safety
20	5.35	3.30
25	4.84	3.12
30	4.20	2.40
35	3.64	1.76
40	2.86	1.24
45	2.44	0.88
50	2.40	1.04
55	2.40	1.08
60	2.40	1.00
65	2.40	0.40

For those with 5 or more years of service, 20% of all terminating members will choose a refund of contributions and 80% will choose a deferred vested benefit. Termination rates are zero at ages where members are expected to retire.

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 (continued):

Retirement Rates:

Age	Retirement Rates (%)			
	General Tiers 1 and A	General Tier B	General Tier C	General Tier D
49	65.0	0.0	0.0	0.0
50	6.0	0.0	0.0	0.0
51	4.0	0.0	0.0	0.0
52	4.0	0.0	4.0	3.0
53	5.0	0.0	4.0	3.0
54	6.0	0.0	4.0	3.0
55	10.0	5.0	4.0	3.0
56	10.0	6.0	4.5	4.0
57	10.0	7.0	5.5	5.0
58	11.0	7.0	5.5	5.0
59	15.0	7.0	5.5	6.0
60	18.0	9.0	7.0	9.0
61	20.0	13.0	10.0	12.0
62	23.0	19.0	14.0	15.0
63	24.0	19.0	15.0	18.0
64	25.0	19.0	15.0	20.0
65	31.0	30.0	26.0	23.0
66	35.0	30.0	30.0	26.0
67	33.0	30.0	30.0	26.0
68	32.0	30.0	30.0	26.0
69	31.0	30.0	30.0	26.0
70	35.0	35.0	35.0	35.0
71	35.0	35.0	35.0	35.0
72	35.0	35.0	35.0	35.0
73	35.0	35.0	35.0	35.0
74	40.0	40.0	40.0	40.0
75 & Over	100.0	100.0	100.0	100.0

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 (continued):

Retirement Rates (continued):

Age	Retirement Rates (%)			
	Safety Tier A	Safety Tier B	Safety Tier C	Safety Tier D
45	2.0	2.0	0.0	0.0
46	2.0	2.0	0.0	0.0
47	2.0	2.0	0.0	0.0
48	3.0	3.0	0.0	0.0
49	9.0	3.5	0.0	0.0
50	14.0	11.0	14.0	14.0
51	12.0	11.0	9.5	9.5
52	11.0	10.0	9.5	9.5
53	15.0	11.0	9.5	9.5
54	15.0	12.0	10.5	10.5
55	15.0	19.0	16.5	15.0
56	18.0	22.0	19.0	17.0
57	18.0	20.0	20.0	18.0
58	19.0	20.0	20.0	18.0
59	20.0	20.0	22.0	20.0
60	22.0	22.0	22.0	20.0
61	25.0	25.0	25.0	25.0
62	25.0	25.0	25.0	25.0
63	25.0	25.0	25.0	25.0
64	25.0	25.0	25.0	25.0
65	50.0	50.0	50.0	50.0
66	50.0	50.0	50.0	50.0
67	50.0	50.0	50.0	50.0
68	50.0	50.0	50.0	50.0
69	50.0	50.0	50.0	50.0
70 & Over	100.0	100.0	100.0	100.0

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 (continued):
Retirement Age and Benefit for Deferred Vested Members	General Retirement Age: 57 Safety Retirement Age: 51 Future deferred vested members who terminate with less than five years of service and are not vested are assumed to retire at age 70 for both General and Safety if they decide to leave their contributions on deposit. 20% of future General and 30% of future Safety deferred vested members are assumed to continue to work for a reciprocal employer. For reciprocals, 4.25% and 4.50% compensation increases are assumed per annum for General and Safety, respectively.
Percent Married:	For all active and inactive members, 75% of male members and 55% of female members are assumed to be married at pre-retirement death or retirement.
Service Converted from Unused Sick Leave:	The following assumptions for service converted from unused sick leave as a percentage of service at retirement are used: General members: 2.00% Safety members: 2.25% Pursuant to Section 31641.02, the cost of this benefit for Tiers 1, A and B members will be charged only to employers and will not affect member contribution rates.

EXHIBIT II – SUMMARY OF PLAN PROVISIONS

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

Plan Year:	July 1 through June 30
Membership Eligibility:	All permanent employees of the County of San Diego or contracting district, scheduled to work 20 or more hours weekly, are eligible, subject to classification below:
General Tier 1	All General members with membership dates before March 8, 2002 who made a specific and irrevocable election to opt out of Tier A. This also included those General Members in deferred status on March 8, 2002.
General Tier A	All General members with membership dates or continuing employment on or after March 8, 2002 and before August 28, 2009, except as noted above.
General Tier B	All General members with membership dates on or after August 28, 2009 and before January 1, 2013.
General Tier C	All General members with membership dates on or after January 1, 2013 and before July 1, 2018.
General Tier D	All General members with membership dates on or after July 1, 2018.
Safety Tier A	All Safety members with membership dates before August 28, 2009.
Safety Tier B	All Safety members with membership dates on or after August 28, 2009 and before January 1, 2013.
Safety Tier C	All Safety members with membership dates on or after January 1, 2013.
Safety Tier D	All Safety members with membership dates on or after July 1, 2020.
Final Compensation for Benefit Determination:	
Tier 1 and Tier A	Highest consecutive 26 biweekly pay periods of compensation earnable (§31462.1) (FAC1).
Tier B	Highest consecutive 78 biweekly pay periods of compensation earnable (§31462) (FAC3).
Tier C and Tier D	Highest consecutive 36 months of pensionable compensation (§7522.10(c), §7522.32 and §7522.34) (FAC3).
Compensation Limit:	
Non-Tier C and Non-Tier D	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.
Tier C and Tier D	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.

Service:	Years of service (Yrs) are generally based on a member's employment during a period of time for which deductions are made from their compensation.	
Service Retirement Eligibility:		
General Tier 1 and Tier A	Age 50 with 10 years of service, or age 70 regardless of service, or after 30 years regardless of age (§31672).	
General Tier B	Age 55 with 10 years of service, or age 70 regardless of service, or after 30 years regardless of age (§31672).	
General Tier C and Tier D	Age 52 with 5 years of service (§7522.20(a)) or age 70 regardless of service (§31672.3).	
Safety Tier A and Tier B	Age 50 with 10 years of service, or age 70 regardless of service, or after 20 years regardless of age (§31663.25).	
Safety Tier C and Tier D	Age 50 with 5 years of service (§7522.25(d)) or age 70 regardless of service (§31672.3).	
Benefit Formula:		
General Tier 1 (§31676.12)	**Retirement Age**	**Benefit Formula**
	50	(1.34% x FAC1 – 1/3 x 1.34% x $350 x 12) x Yrs
	55	(1.77% x FAC1 – 1/3 x 1.77% x $350 x 12) x Yrs
	60	(2.34% x FAC1 – 1/3 x 2.34% x $350 x 12) x Yrs
	62 and over	(2.62% x FAC1 – 1/3 x 2.62% x $350 x 12) x Yrs
General Tier A (§31676.17)	**Retirement Age**	**Benefit Formula**
	50	(2.00% x FAC1 – 1/3 x 2.00% x $350 x 12) x Yrs
	55	(2.50% x FAC1 – 1/3 x 2.50% x $350 x 12) x Yrs
	60 and over	(3.00% x FAC1 – 1/3 x 3.00% x $350 x 12) x Yrs
General Tier B (§31676.12)	**Retirement Age**	**Benefit Formula**
	50	(1.34% x FAC3 – 1/3 x 1.34% x $350 x 12) x Yrs
	55	(1.77% x FAC3 – 1/3 x 1.77% x $350 x 12) x Yrs
	60	(2.34% x FAC3 – 1/3 x 2.34% x $350 x 12) x Yrs
	62 and over	(2.62% x FAC3 – 1/3 x 2.62% x $350 x 12) x Yrs

General Tier C (§7522.20(a))	**Retirement Age**	**Benefit Formula**
	52	1.00% x FAC3 x Yrs
	55	1.30% x FAC3 x Yrs
	60	1.80% x FAC3 x Yrs
	62	2.00% x FAC3 x Yrs
	65	2.30% x FAC3 x Yrs
	67 and over	2.50% x FAC3 x Yrs
General Tier D (§31676.01)	**Retirement Age**	**Benefit Formula**
	52	0.87% x FAC3 x Yrs
	55	0.99% x FAC3 x Yrs
	60	1.28% x FAC3 x Yrs
	62	1.39% x FAC3 x Yrs
	65 and over	1.62% x FAC3 x Yrs
Safety Tier A (§31664.1)	**Retirement Age**	**Benefit Formula**
	50 and over	3.00% x FAC1 x Yrs
Safety Tier B (§31664.2)	**Retirement Age**	**Benefit Formula**
	50	2.29% x FAC3 x Yrs
	55 and over	3.00% x FAC3 x Yrs
Safety Tier C (§7522.25(d))	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAC3 x Yrs
	55	2.50% x FAC3 x Yrs
	57 and over	2.70% x FAC3 x Yrs
Safety Tier D (§7522.25(c))	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAC3 x Yrs
	55	2.36% x FAC3 x Yrs
	57 and over	2.50% x FAC3 x Yrs

Maximum Benefit:	
Non-Tier C and Non-Tier D	100% of Final Average Compensation (§31676.12, §31676.17, §31664.1, §31664.2).
Tier C and Tier D	There is no Final Compensation limit on the maximum retirement benefit.
Non Service Connected Disability:	
General	
Eligibility	Five years of service (§31720).
Benefit	1.8% per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 62, but the total benefit cannot be more than one-third of Final Compensation. (§31727.1). For all members, 100% of the Service Retirement benefit will be paid, if greater.
Safety	
Eligibility	Five years of service (§31720).
Benefit	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 (§31727.2). For all members, 100% of the Service Retirement benefit will be paid, if greater.
Service Connected Disability:	
All Members	
Eligibility	No age or service requirements (§31720).
Benefit	50% of the Final Compensation or 100% of Service Retirement benefit, if greater (§31727.4).

Pre-Retirement Death:	
All Members	
Eligibility	None.
Basic lump sum benefit	Refund of member contributions with interest, plus one month's compensation for each year of service, to a maximum of six months' compensation (§31781).
Service Connected Death	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787). In addition, safety members are entitled to benefits under Sections 31787.5 and 31787.6.
Vested Members	
Eligibility	Five years of service.
Basic benefit	60% of the greater of Service or Non Service Connected 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). Alternatively, the spouse may choose a combined benefit of: • A lump sum payment of up to 6 months' compensation (see above), and • A monthly (60%) benefit reduced by actuarial equivalent of the lump sum payment (§31781.3).
Death After Retirement:	
All Members	
Service Retirement or Non Service Connected Disability Retirement	Unless another option was selected at retirement, 60% of member's unmodified allowance continued to eligible spouse (§31760.1) and $3,500 lump sum benefit payable to member's beneficiary (§31789.3). An eligible spouse is a surviving spouse who was married to the member at least one year prior to the 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 (§31760.2).
Service Connected Disability Retirement	Unless another option was selected at retirement, 100% of member's unmodified allowance continued to eligible spouse (§31786).
Withdrawal Benefits:	
Less than Five Years of Service	Refund of accumulated employee contributions with interest, or earned benefit at age 70 (§31628). A member may also elect to leave contributions on deposit in the retirement fund (§31629.5).
Five or More Years of Service	If contributions left on deposit, a member is entitled to earned benefits commencing at any time after eligible to retire (§31700).

Post-retirement Cost-of-Living Benefits:	
Tier 1 and Tier A	Future changes based on changes to the Consumer Price Index for the San Diego-Carlsbad Area to a maximum of 3% per year, excess "banked" (§31870.1).
Tier B, Tier C and Tier D	Future changes based on changes to the Consumer Price Index for the San Diego-Carlsbad Area to a maximum of 2% per year, excess "banked" (§31870).
Supplemental Benefit Allowance and Health Insurance Allowance:	The Association provides a supplemental benefit allowance and a health insurance allowance for eligible retirees. These benefits have been excluded from this valuation. The supplemental benefit allowance has been suspended due to lack of funds to continue to provide for that benefit.
Member Contributions:	Please refer to Section 4, Exhibit III for the specific rates.
General Tier 1	
Basic	Entry-age based rates that provide for an annuity at age 60 equal to 1/100 of FAC1 (§31621.2).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
General Tier A	
Basic	Entry-age based rates that provide for an annuity at age 55 equal to 1/100 of FAC1 (§31621.8).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
General Tier B	
Basic	Entry-age based rates that provide for an annuity at age 60 equal to 1/100 of FAC3 (§31621.2).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
Safety Tier A	
Basic	Entry-age based rates that provide for an annuity at age 50 equal to 1/100 of FAC1 (§31639.25).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
Safety Tier B	
Basic	Entry-age based rates that provide for an annuity at age 50 equal to 1/100 of FAC3 (§31639.25).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
Tier C and Tier D	Non-entry age based rates that provide for 50% of total Normal Cost Rate.
Other Information:	Non-Tier C and Non-Tier D members with 30 or more years of qualifying service credit are exempt from paying member contributions (§31625.2 and §31625.3).

Changed Plan Provisions:	San Diego County Board of Supervisors adopted Safety Tier D on January 8, 2019 under Resolution No. 19-004. Safety Tier D applied to Safety employees with membership date on or after July 1, 2020.

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 the actuary so they can both be sure the proper provisions are valued.

EXHIBIT III – MEMBER CONTRIBUTION RATES

Comparison of Member Rate at Entry Age 35 for General and Entry Age 30 for Safety Members for Non-CalPEPRA Members and at any Entry Ages for CalPEPRA Members.

	June 30, 2019			June 30, 2018			
	Basic	COLA	Total	Basic	COLA	Total	Change
General Tier 1[1]	8.62%	3.49%	12.11%	7.93%	3.05%	10.98%	**1.13%**
General Tier A[1]	9.87%	4.62%	14.49%	9.11%	4.07%	13.18%	**1.31%**
General Tier B[1]	8.28%	2.15%	10.43%	7.61%	1.71%	9.32%	**1.11%**
General Tier C	N/A	N/A	9.14%	N/A	N/A	8.31%	**0.83%**
General Tier D	N/A	N/A	6.50%	N/A	N/A	6.02%	**0.48%**
Safety Tier A	10.37%	6.42%	16.79%	9.78%	6.14%	15.92%	**0.87%**
Safety Tier B	9.95%	3.46%	13.41%	9.36%	2.99%	12.35%	**1.06%**
Safety Tier C	N/A	N/A	15.23%	N/A	N/A	14.88%	**0.35%**
Safety Tier D	N/A	N/A	14.53%	N/A	N/A	14.22%	**0.31%**

[1] Rates shown are for salaries in excess of $350 per month.

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

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

General Tier 1						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
15	4.22%	6.33%	1.71%	2.56%	5.93%	8.89%
16	4.22%	6.33%	1.71%	2.56%	5.93%	8.89%
17	4.29%	6.43%	1.74%	2.61%	6.03%	9.04%
18	4.36%	6.54%	1.77%	2.65%	6.13%	9.19%
19	4.43%	6.65%	1.79%	2.69%	6.22%	9.34%
20	4.51%	6.76%	1.83%	2.74%	6.34%	9.50%
21	4.58%	6.87%	1.85%	2.78%	6.43%	9.65%
22	4.65%	6.98%	1.89%	2.83%	6.54%	9.81%
23	4.73%	7.10%	1.92%	2.88%	6.65%	9.98%
24	4.81%	7.21%	1.95%	2.92%	6.76%	10.13%
25	4.89%	7.33%	1.98%	2.97%	6.87%	10.30%
26	4.97%	7.45%	2.01%	3.02%	6.98%	10.47%
27	5.05%	7.57%	2.05%	3.07%	7.10%	10.64%
28	5.13%	7.70%	2.08%	3.12%	7.21%	10.82%
29	5.21%	7.82%	2.11%	3.17%	7.32%	10.99%
30	5.30%	7.95%	2.15%	3.22%	7.45%	11.17%
31	5.39%	8.08%	2.18%	3.27%	7.57%	11.35%
32	5.47%	8.21%	2.22%	3.33%	7.69%	11.54%
33	5.57%	8.35%	2.25%	3.38%	7.82%	11.73%
34	5.65%	8.48%	2.29%	3.44%	7.94%	11.92%
35	5.75%	8.62%	2.33%	3.49%	8.08%	12.11%
36	5.84%	8.76%	2.37%	3.55%	8.21%	12.31%
37	5.94%	8.91%	2.41%	3.61%	8.35%	12.52%
38	6.04%	9.06%	2.45%	3.67%	8.49%	12.73%
39	6.14%	9.21%	2.49%	3.73%	8.63%	12.94%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 1 (continued)						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
40	6.24%	9.36%	2.53%	3.79%	8.77%	13.15%
41	6.35%	9.52%	2.57%	3.86%	8.92%	13.38%
42	6.46%	9.69%	2.62%	3.93%	9.08%	13.62%
43	6.57%	9.86%	2.67%	4.00%	9.24%	13.86%
44	6.69%	10.03%	2.71%	4.06%	9.40%	14.09%
45	6.81%	10.21%	2.76%	4.14%	9.57%	14.35%
46	6.93%	10.39%	2.81%	4.21%	9.74%	14.60%
47	7.05%	10.57%	2.85%	4.28%	9.90%	14.85%
48	7.16%	10.74%	2.90%	4.35%	10.06%	15.09%
49	7.28%	10.92%	2.95%	4.42%	10.23%	15.34%
50	7.40%	11.10%	3.00%	4.50%	10.40%	15.60%
51	7.52%	11.28%	3.05%	4.57%	10.57%	15.85%
52	7.64%	11.46%	3.09%	4.64%	10.73%	16.10%
53	7.75%	11.63%	3.14%	4.71%	10.89%	16.34%
54	7.85%	11.77%	3.18%	4.77%	11.03%	16.54%
55	7.92%	11.88%	3.21%	4.81%	11.13%	16.69%
56	7.93%	11.90%	3.21%	4.82%	11.14%	16.72%
57	7.91%	11.86%	3.21%	4.81%	11.12%	16.67%
58	7.87%	11.80%	3.19%	4.78%	11.06%	16.58%
59 & Over	7.74%	11.61%	3.13%	4.70%	10.87%	16.31%

Interest:	7.00% per annum
COLA:	2.75%
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:	40.52%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier A						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
15	4.83%	7.24%	2.26%	3.39%	7.09%	10.63%
16	4.83%	7.24%	2.26%	3.39%	7.09%	10.63%
17	4.91%	7.36%	2.29%	3.44%	7.20%	10.80%
18	4.99%	7.48%	2.33%	3.50%	7.32%	10.98%
19	5.07%	7.60%	2.37%	3.55%	7.44%	11.15%
20	5.15%	7.73%	2.41%	3.62%	7.56%	11.35%
21	5.23%	7.85%	2.45%	3.67%	7.68%	11.52%
22	5.32%	7.98%	2.49%	3.73%	7.81%	11.71%
23	5.41%	8.11%	2.53%	3.79%	7.94%	11.90%
24	5.49%	8.24%	2.57%	3.85%	8.06%	12.09%
25	5.59%	8.38%	2.61%	3.92%	8.20%	12.30%
26	5.68%	8.52%	2.65%	3.98%	8.33%	12.50%
27	5.77%	8.65%	2.70%	4.05%	8.47%	12.70%
28	5.87%	8.80%	2.75%	4.12%	8.62%	12.92%
29	5.96%	8.94%	2.79%	4.18%	8.75%	13.12%
30	6.06%	9.09%	2.83%	4.25%	8.89%	13.34%
31	6.16%	9.24%	2.88%	4.32%	9.04%	13.56%
32	6.26%	9.39%	2.93%	4.39%	9.19%	13.78%
33	6.36%	9.54%	2.97%	4.46%	9.33%	14.00%
34	6.47%	9.70%	3.03%	4.54%	9.50%	14.24%
35	6.58%	9.87%	3.08%	4.62%	9.66%	14.49%
36	6.69%	10.04%	3.13%	4.70%	9.82%	14.74%
37	6.81%	10.21%	3.19%	4.78%	10.00%	14.99%
38	6.93%	10.39%	3.24%	4.86%	10.17%	15.25%
39	7.05%	10.57%	3.29%	4.94%	10.34%	15.51%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier A (continued)						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
40	7.17%	10.76%	3.35%	5.03%	10.52%	15.79%
41	7.30%	10.95%	3.41%	5.12%	10.71%	16.07%
42	7.42%	11.13%	3.47%	5.21%	10.89%	16.34%
43	7.55%	11.32%	3.53%	5.29%	11.08%	16.61%
44	7.67%	11.51%	3.59%	5.38%	11.26%	16.89%
45	7.80%	11.70%	3.65%	5.47%	11.45%	17.17%
46	7.93%	11.89%	3.71%	5.56%	11.64%	17.45%
47	8.05%	12.08%	3.77%	5.65%	11.82%	17.73%
48	8.17%	12.25%	3.82%	5.73%	11.99%	17.98%
49	8.27%	12.40%	3.87%	5.80%	12.14%	18.20%
50	8.35%	12.52%	3.91%	5.86%	12.26%	18.38%
51	8.36%	12.54%	3.91%	5.86%	12.27%	18.40%
52	8.33%	12.50%	3.90%	5.85%	12.23%	18.35%
53	8.29%	12.43%	3.87%	5.81%	12.16%	18.24%
54 & Over	8.15%	12.23%	3.81%	5.72%	11.96%	17.95%

Interest: 7.00% per annum
COLA: 2.75%
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: 46.77%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier B						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
15	4.05%	6.08%	1.05%	1.58%	5.10%	7.66%
16	4.05%	6.08%	1.05%	1.58%	5.10%	7.66%
17	4.12%	6.18%	1.07%	1.60%	5.19%	7.78%
18	4.19%	6.28%	1.09%	1.63%	5.28%	7.91%
19	4.26%	6.39%	1.11%	1.66%	5.37%	8.05%
20	4.33%	6.49%	1.12%	1.68%	5.45%	8.17%
21	4.40%	6.60%	1.14%	1.71%	5.54%	8.31%
22	4.47%	6.71%	1.16%	1.74%	5.63%	8.45%
23	4.55%	6.82%	1.18%	1.77%	5.73%	8.59%
24	4.62%	6.93%	1.20%	1.80%	5.82%	8.73%
25	4.69%	7.04%	1.21%	1.82%	5.90%	8.86%
26	4.77%	7.16%	1.24%	1.86%	6.01%	9.02%
27	4.85%	7.28%	1.26%	1.89%	6.11%	9.17%
28	4.93%	7.39%	1.28%	1.92%	6.21%	9.31%
29	5.01%	7.51%	1.30%	1.95%	6.31%	9.46%
30	5.09%	7.64%	1.32%	1.98%	6.41%	9.62%
31	5.17%	7.76%	1.34%	2.01%	6.51%	9.77%
32	5.26%	7.89%	1.37%	2.05%	6.63%	9.94%
33	5.35%	8.02%	1.39%	2.08%	6.74%	10.10%
34	5.43%	8.15%	1.41%	2.11%	6.84%	10.26%
35	5.52%	8.28%	1.43%	2.15%	6.95%	10.43%
36	5.61%	8.42%	1.45%	2.18%	7.06%	10.60%
37	5.71%	8.56%	1.48%	2.22%	7.19%	10.78%
38	5.80%	8.70%	1.51%	2.26%	7.31%	10.96%
39	5.90%	8.85%	1.53%	2.29%	7.43%	11.14%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier B (continued)						
	Basic		COLA		Total	
Entry Age	First $350	Over $350	First $350	Over $350	First $350	Over $350
40	6.00%	9.00%	1.55%	2.33%	7.55%	11.33%
41	6.10%	9.15%	1.58%	2.37%	7.68%	11.52%
42	6.21%	9.31%	1.61%	2.41%	7.82%	11.72%
43	6.31%	9.47%	1.63%	2.45%	7.94%	11.92%
44	6.42%	9.63%	1.67%	2.50%	8.09%	12.13%
45	6.53%	9.79%	1.69%	2.54%	8.22%	12.33%
46	6.64%	9.96%	1.72%	2.58%	8.36%	12.54%
47	6.75%	10.12%	1.75%	2.62%	8.50%	12.74%
48	6.85%	10.28%	1.77%	2.66%	8.62%	12.94%
49	6.96%	10.44%	1.81%	2.71%	8.77%	13.15%
50	7.07%	10.60%	1.83%	2.75%	8.90%	13.35%
51	7.17%	10.75%	1.86%	2.79%	9.03%	13.54%
52	7.25%	10.88%	1.88%	2.82%	9.13%	13.70%
53	7.33%	10.99%	1.90%	2.85%	9.23%	13.84%
54	7.37%	11.05%	1.91%	2.86%	9.28%	13.91%
55	7.37%	11.05%	1.91%	2.86%	9.28%	13.91%
56	7.33%	11.00%	1.90%	2.85%	9.23%	13.85%
57	7.25%	10.88%	1.88%	2.82%	9.13%	13.70%
58	7.49%	11.24%	1.94%	2.91%	9.43%	14.15%
59 & Over	7.74%	11.61%	2.01%	3.01%	9.75%	14.62%

Interest: 7.00% per annum
COLA: 2.00%
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: 25.92%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

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

Safety Tier A			
Entry Age	Basic	COLA	Total
15	8.99%	5.56%	14.55%
16	8.99%	5.56%	14.55%
17	8.99%	5.56%	14.55%
18	8.99%	5.56%	14.55%
19	8.99%	5.56%	14.55%
20	8.99%	5.56%	14.55%
21	8.99%	5.56%	14.55%
22	9.13%	5.65%	14.78%
23	9.27%	5.74%	15.01%
24	9.42%	5.83%	15.25%
25	9.57%	5.92%	15.49%
26	9.72%	6.02%	15.74%
27	9.88%	6.12%	16.00%
28	10.04%	6.21%	16.25%
29	10.20%	6.31%	16.51%
30	10.37%	6.42%	16.79%
31	10.54%	6.52%	17.06%
32	10.72%	6.64%	17.36%
33	10.90%	6.75%	17.65%
34	11.09%	6.86%	17.95%
35	11.29%	6.99%	18.28%
36	11.48%	7.11%	18.59%
37	11.68%	7.23%	18.91%
38	11.89%	7.36%	19.25%
39	12.10%	7.49%	19.59%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier A (continued)			
Entry Age	Basic	COLA	Total
40	12.31%	7.62%	19.93%
41	12.54%	7.76%	20.30%
42	12.76%	7.90%	20.66%
43	12.93%	8.00%	20.93%
44	13.09%	8.10%	21.19%
45	13.09%	8.10%	21.19%
46	13.09%	8.10%	21.19%
47	13.07%	8.09%	21.16%
48	12.98%	8.03%	21.01%
49 & Over	12.69%	7.86%	20.55%

Interest:	7.00% per annum
COLA:	2.75%
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:	61.90%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier B			
Entry Age	Basic	COLA	Total
15	8.62%	3.00%	11.62%
16	8.62%	3.00%	11.62%
17	8.62%	3.00%	11.62%
18	8.62%	3.00%	11.62%
19	8.62%	3.00%	11.62%
20	8.62%	3.00%	11.62%
21	8.62%	3.00%	11.62%
22	8.76%	3.05%	11.81%
23	8.90%	3.10%	12.00%
24	9.04%	3.15%	12.19%
25	9.19%	3.20%	12.39%
26	9.33%	3.25%	12.58%
27	9.48%	3.30%	12.78%
28	9.63%	3.35%	12.98%
29	9.79%	3.41%	13.20%
30	9.95%	3.46%	13.41%
31	10.12%	3.52%	13.64%
32	10.29%	3.58%	13.87%
33	10.46%	3.64%	14.10%
34	10.64%	3.70%	14.34%
35	10.82%	3.76%	14.58%
36	11.00%	3.83%	14.83%
37	11.19%	3.89%	15.08%
38	11.38%	3.96%	15.34%
39	11.57%	4.03%	15.60%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier B (continued)			
Entry Age	Basic	COLA	Total
40	11.75%	4.09%	15.84%
41	11.93%	4.15%	16.08%
42	12.07%	4.20%	16.27%
43	12.15%	4.23%	16.38%
44	12.17%	4.23%	16.40%
45	12.14%	4.22%	16.36%
46	12.07%	4.20%	16.27%
47	11.89%	4.14%	16.03%
48	12.28%	4.27%	16.55%
49 & Over	12.69%	4.41%	17.10%

Interest:	7.00% per annum
COLA:	2.00%
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:	34.79%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

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

All Entry Age	Total
General Tier C	9.14%
General Tier D	6.50%
Safety Tier C	15.23%
Safety Tier D	14.53%

Note: Tier C and Tier D member contribution rate is 50% of the Normal Cost rate.