Segal Consulting

Imperial County Employees' Retirement System

Actuarial Valuation and Review as of June 30, 2019

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December 9, 2019

Board of Retirement
Imperial County Employees' Retirement System
1221 West State Street
El Centro, CA 92243

Dear Board Members:

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

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

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

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

Sincerely,

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

By: Andy Yeung

Andy Yeung, ASA, EA, MAAA, FCA
Vice President and Actuary

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Senior Vice President and Actuary

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

Section 1: Actuarial Valuation Summary

Purpose and Basis

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

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

The contribution requirements presented in this report are based on:

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

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

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

The contribution requirements are determined as a percentage of payroll. The System's employer rates provide for both Normal Cost and a contribution to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have applied the funding policy adopted by the Board on March 21, 2012 and reviewed by the Board on May 8, 2017. Details of the funding policy are provided in *Section 4, Exhibit I* on page 77.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit H* beginning on page 59. A graphical projection of the Unfunded Actuarial Accrued Liability (UAAL) amortization balances and payments has been included in *Section 3, Exhibit I* on pages 64 and 65.

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 $3.8 million in deferred investment gain 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 Issues* section on pages 8 and 9.

Significant Issues

Ref: Pg. 79

1. Many bargaining units have entered into agreements with the County for the employer to pick up the Supplemental UAAL contributions for the Tier 3 members. The results of this valuation reflect agreements to pick up those contributions in effect as of August 15, 2019. According to a list provided by ICERS on August 15, 2019, all bargaining units covering General Tier 3 members except for the Professional Legal Bargaining Unit have reached this agreement, and all bargaining units covering Safety Tier 3 members have reached this agreement. Additional details, including their combined payroll, are provided in *Section 2*. Members belonging to the bargaining units that have reached this agreement (referenced in this valuation report as "Employer Picks Up Supplemental UAAL") have a separate set of Tier 3 employer and member contribution rates that differ from the Tier 3 employer and member contribution rates for members who are not a part of the bargaining units that have reached this agreement (referenced in this valuation report as "Member Pays Supplemental UAAL").

Ref: Pgs. 34, 90, 93

Ref: Pg. 57

2. As of June 30, 2019, the System has a zero balance in the Member and Retiree Non-valuation Reserves, Employee Benefit Enhancement Reserve, Employee COLA Contribution Relief Reserve and Unallocated Earnings Reserve. Because the interest credited on the valuation reserves, gross of the negative contingency reserve, was greater than the System's actual investment return, in order to credit interest to the valuation reserves at the assumed earnings rate the balance of the Contingency Reserve decreased from negative $82.2 million as of June 30, 2018 to negative $113.4 million as of June 30, 2019. According to the Interest Crediting and Undistributed Earnings Policy updated by the Board in 2011, the Contingency Reserve has to be restored to 1% of the assets in the future before the System will accumulate unallocated earnings that could be used to provide contribution rate relief and/or non-statutory benefits.

Ref: Pgs. 37, 28

3. In this June 30, 2019 valuation, the ratio of the valuation value of assets to the actuarial accrued liabilities has decreased from 88.3% to 87.1%. On a market value basis, this funded ratio has decreased from 88.0% to 87.7%. In this valuation, the System's UAAL when measured on a valuation value of assets basis has increased from $110.2 million to $129.1 million. A reconciliation of the change in UAAL is provided in *Section 2, Subsection E*.

Ref: Pgs. 30, 31

4. The adopted and recommended aggregate employer rate[1] from the June 30, 2018 valuation was 21.53%. The aggregate employer rate calculated in this valuation has increased to 22.52% of payroll. The employer rates include the funding of the Regular benefit plus an amount required to fund the outstanding balance of one-third of the UAAL for the Safety members' Supplemental benefit as determined in the June 30, 2006 valuation, plus the pickup of Supplemental UAAL contributions for Tier 3 members belonging to a bargaining unit that has reached such agreement. This year's increase in the rate is primarily due to: (i) a lower than expected return on the assets for Regular benefits after "smoothing", (ii) a loss due to retirement experience, and (iii) other actuarial losses, offset somewhat by (iv) an overall decrease in the UAAL rate resulting from a

[1] The calculated employer rates include an employer pick-up of members' contributions equal to 3% of payroll for General and Safety members in the Legacy Tiers.

larger than expected increase in total payroll, and (v) individual salary increases less than expected. A reconciliation of the System's aggregate employer rate as well as employer rates by tier are provided in *Section 2, Subsection F*.

Ref: Pgs. 32, 33

5. The adopted and recommended aggregate member rate[2] from the June 30, 2018 valuation was 12.13%. The aggregate member rate calculated in this valuation has increased to 12.21% of payroll. This year's increase in the rate is primarily due to: (i) a less than expected return on the assets for Supplemental benefits after "smoothing" and (ii) other actuarial losses, offset somewhat by (iii) individual salary increases less than expected, (iv) changes in demographics of members affecting Normal Cost, and (v) a change in the allocation of administrative expenses. A reconciliation of the System's aggregate member rate as well as member rates by tier are provided in *Section 2, Subsection F*.

Ref: Pg. 34

6. Safety Legacy members are exempt from making member contributions to fund the regular benefits after they have attained 30 years of service, and such contributions will be picked up by the employer. As part of our review of the System's funding policy in May 2017, we raised a question on whether this exemption would also apply to member contributions to fund the Supplemental benefits. After seeking input from the employer, the System has clarified for us that the employer will also pick up such contributions to fund the Supplemental benefits. As there is one Safety Legacy member who has attained 30 years of service as of June 30, 2019, we have included the pickup contributions for both Normal Cost and UAAL related to the supplemental benefits. A similar adjustment has also been made to the Normal Cost for the regular benefits. (There is a similar provision in the 1937 Act for the General Legacy members but those members would have to be hired on or before March 7, 1973 in addition to having 30 years of service. There are no such members as of June 30, 2019.)

Ref: Pg. 70

7. Contributions toward administrative expenses are allocated between the employers and the members based on the relative proportion of their respective contributions to the total. We have updated the allocation of contribution rates for administrative expenses to reflect the agreements reached by several bargaining units for the employer to pick up the Supplemental UAAL contributions for Tier 3 members that had not yet been reached at the time of the prior valuation. We will continue this practice of updating the allocation annually in future actuarial valuations to reflect any changes in the relative proportions of employer and member contributions.

Ref: Pg. 20

The total unrecognized net investment <u>gain</u> as of June 30, 2019 is $3.8 million as compared to an unrecognized net investment <u>loss</u> of $6.8 million in the previous valuation. This deferred investment gain will be recognized in the determination of the valuation value of assets for funding purposes in the next few years as shown in *Section 2, Subsection B.*

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[2] The aggregate member rate is calculated by taking the member rates for a General Legacy member at entry age 33, a Safety Legacy member at entry age 28, a General Tier 3 member, and a Safety Tier 3 member, and weighting those rates by the projected payrolls for members in the four tiers.

The net deferred gains of $3.8 million represent about 0.4% of the market value of assets. Unless offset by future investment losses or other unfavorable experience, the recognition of the $3.8 million market gains is expected to have an impact on the System's future funded percentage and contribution rate requirements. This potential impact may be illustrated as follows:

a. If the deferred gains were recognized immediately in the valuation value of assets (and assuming further that the Reserve for Capital Assets were to be used as assets in the valuation), the funded percentage would increase from 87.1% to 87.7%.

   For comparison purposes, if all the deferred losses in the June 30, 2018 valuation had been recognized immediately in the June 30, 2018 valuation, the funded percentage would have decreased from 88.3% to 88.0%.

b. If the deferred gains were recognized immediately in the valuation value of assets (and assuming further that the Reserve for Capital Assets were to be used as assets in the valuation), the aggregate employer contribution rate would decrease from 22.52% of payroll to 22.11% of payroll and the aggregate member contribution rate would decrease from 12.21% of payroll to 12.18% of payroll.

   For comparison purposes, if all the deferred losses in the June 30, 2018 valuation had been recognized immediately in the June 30, 2018 valuation, the recommended aggregate employer contribution rate would have increased from 21.75% of payroll to 22.00% of payroll and the recommended aggregate member contribution rate would have increased from 12.61% of payroll to 12.63% of payroll.[3]

Footnote (1) in the Determination of Actuarial Value of Assets on page 20 shows that under the asset smoothing method the $3.8 million in the net deferred gain will be recognized in the next five years, but in a very uneven pattern. In particular, there will be a loss of $5.4 million recognized next year, followed in successive following years by a gain of $5.2 million, a gain of $1.8 million, a loss of $4.0 million, and a gain of $6.2 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 will somewhat offset each other, but only at the end of the five years.

In keeping with the Board's Funding Policy and consistent with a similar action taken by the Board in 2011, the asset smoothing method could be adjusted by combining the net deferred gain of $3.8 million from the current valuation into a single four and a half years smoothing "layer" and thereby recognizing the net deferred gain of $3.8 million over the next five years in nine level amounts of approximately $0.4 million in each of the next nine semi-annual interest crediting periods. 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.

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[3] These recommended rates are different from those shown above because they have not been recomposited to reflect the proportion of payrolls among the different Tiers and General/Safety membership classes.

Please note that this change would have no effect on the current June 30, 2019 valuation results as the total amount of the net unrecognized gain as of June 30, 2019 remains unchanged. Also, note that we recommend using nine semi-annual periods as the smoothing period for the combined net gain as that will complete the recognition of the net gain 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 value of assets subsequent to that date are not reflected. Declines in asset values will increase the actuarial cost of the plan, while increases will decrease the actuarial cost of the plan.

Ref: Pg. 41

9. The Actuarial Standards Board approved a new Actuarial Standard of Practice No. 51 (ASOP 51) regarding risk assessment. ASOP 51 is effective with ICERS' 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 ICERS 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 System's staff regarding specific content for a more detailed analysis of the potential range of the impact of risk relative to the System'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 System 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 ICERS 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 Legacy	22.38%	$15,349	21.46%	$14,719
	• General Tier 3 (Member Pays Supplemental UAAL)	17.03%	747	16.21%	711
	• General Tier 3 (Employer Picks up Supplemental UAAL)	17.59%	5,814	16.67%	5,509
	• Safety Legacy	31.85%	5,231	30.69%	5,039
	• Safety Tier 3 (Member Pays Supplemental UAAL)[3]	24.69%	0	23.42%	0
	• Safety Tier 3 (Employer Picks up Supplemental UAAL)	29.48%	1,838	27.67%	1,725
	All Categories Combined	22.52%	$28,979	21.53%[2]	$27,703
Average Member Contribution Rates:	• General Legacy (Average Entry Age: 33)	10.93%	$7,497	10.85%	$7,442
	• General Tier 3 (Member Pays Supplemental UAAL)	9.82%	431	9.85%	432
	• General Tier 3 (Employer Picks up Supplemental UAAL)	9.20%	3,041	9.34%	3,087
	• Safety Legacy (Average Entry Age: 28)	23.41%	3,844	22.84%	3,751
	• Safety Tier 3 (Member Pays Supplemental UAAL)[3]	19.69%	0	19.02%	0
	• Safety Tier 3 (Employer Picks up Supplemental UAAL)	14.48%	903	14.40%	898
	All Categories Combined	12.21%	$15,716	12.13%[2]	$15,610

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

(2) The aggregate recommended rates as of June 30, 2018 are different from those shown in the June 30, 2018 report because they have been recomposited to reflect the proportion of June 30, 2019 projected payrolls among the different Tiers and General/Safety membership classes.

(3) At the time of this valuation, all bargaining units covering Safety Tier 3 members have reached an agreement with the County for the employer to pick up the Supplemental UAAL contributions for the Tier 3 members. The employer and member contribution rates for Safety Tier 3 where the member still pays the Supplemental UAAL have been included for informational purposes only.

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	$530,146	$502,620
	• Inactive vested members[1]	41,781	36,238
	• Active members	426,763	406,527
	• Total Actuarial Accrued Liability	998,690	945,385
	• Normal Cost for plan year beginning June 30[2]	32,093	30,484
Assets as of June 30:	• Market Value of Assets (MVA)	$876,015	$831,484
	• Valuation Value of Assets (VVA)[3]	869,620	835,211
Funded status as of June 30:	• Unfunded Actuarial Accrued Liability on MVA basis	$122,675	$113,901
	• Funded percentage on MVA basis	87.7%	88.0%
	• Unfunded Actuarial Accrued Liability on VVA basis	$129,070	$110,174
	• Funded percentage on VVA basis	87.1%	88.3%
Key assumptions:	• Net investment return	7.25%	7.25%
	• Price inflation	3.00%	3.00%
	• Payroll growth	3.50%	3.50%

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

(2) Includes the administrative expense load applied to the Normal Cost contribution rates.

(3) Excludes non-valuation reserves.

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	2,283	2,161	5.6%
	• Average age	41.8	42.1	-0.3
	• Average service	9.8	10.1	-0.3
	• Total projected compensation	$128,680,972	$118,799,245	8.3%
	• Average projected compensation	$56,365	$54,974	2.5%
	Retired Members and Beneficiaries:			
	• Number of members:			
	– Service retired	912	878	3.9%
	– Disability retired	142	138	2.9%
	– Beneficiaries	178	177	0.6%
	– Total	1,232	1,193	3.3%
	• Average age	69.3	69.1	0.2
	• Average monthly benefit	$2,989	$2,904	2.9%
	Inactive Vested Members:			
	• Number of members[1]	526	500	5.2%
	• Average Age	43.0	42.9	0.1
	Total Members:	4,041	3,854	4.9%

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

Important Information About Actuarial Valuations

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

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

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the Market Value of Assets as of the valuation date, as provided by the System. The System uses 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 System. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:
  - Differences between actual experience and anticipated experience;
  - Changes in actuarial assumptions or methods; and
  - Changes in statutory provisions.
- If the System is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The System should look to their other advisors for expertise in these areas.

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

A. Member Data

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

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

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

MEMBER POPULATION: 2010 – 2019

Year Ended June 30	Active Members	Inactive Vested Members(1)	Retired Members and Beneficiaries(2)	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2010	1,944	247	877	1,124	0.58	0.45
2011	1,947	247	924	1,171	0.60	0.47
2012	1,921	332	977	1,309	0.68	0.51
2013	1,919	354	975	1,329	0.69	0.51
2014	1,987	374	1,007	1,381	0.70	0.51
2015	2,057	404	1,027	1,431	0.70	0.50
2016	2,127	425	1,078	1,503	0.71	0.51
2017	2,186	451	1,121	1,572	0.72	0.51
2018	2,161	500	1,193	1,693	0.78	0.55
2019	2,283	526	1,232	1,758	0.77	0.54

(1) Starting with the June 30, 2012 valuation, includes terminated members due a refund of member contributions. For all years, members with both General and Safety service were counted once based on their latest membership category.

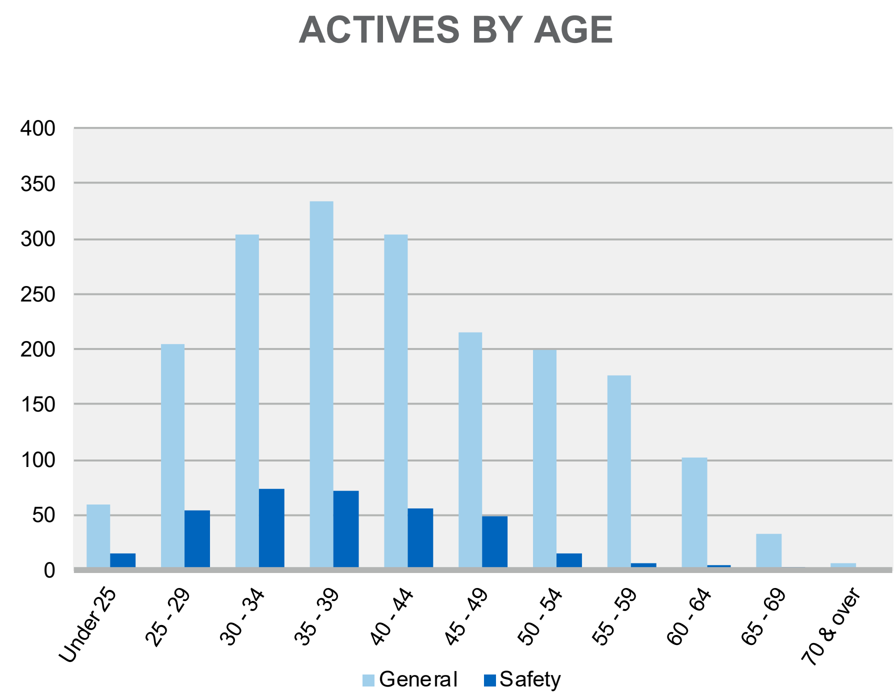
(2) Prior to the 2013 valuation, retired members and beneficiaries receiving both General and Safety benefits were reported as two separate records. Starting with the June 30, 2013 valuation, these members are only counted once based on their latest membership category. There were 66 such retired members and beneficiaries as of June 30, 2013.

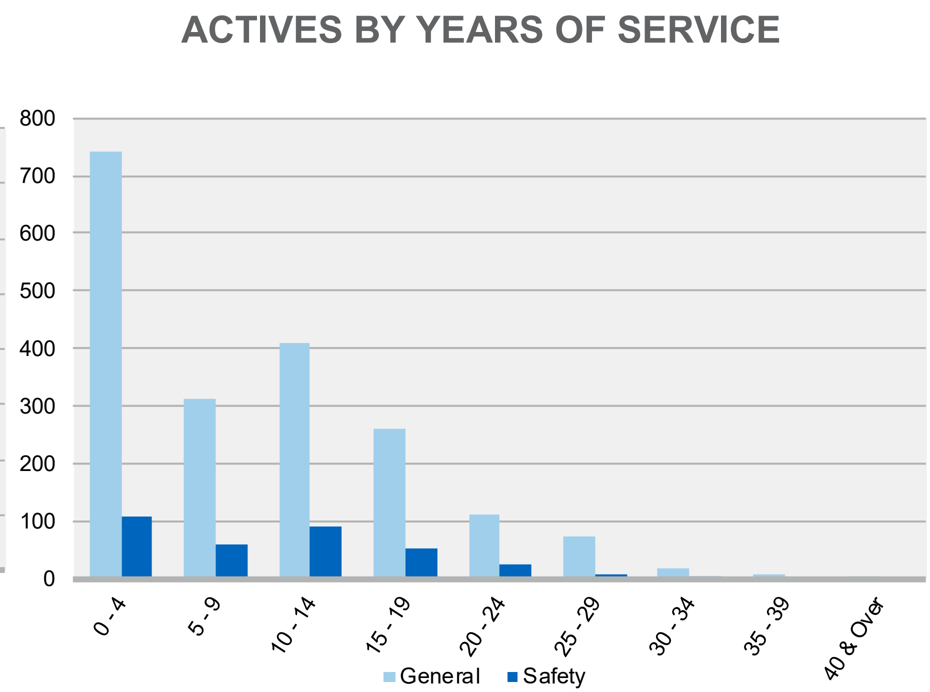
Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 2,283 active members with an average age of 41.8, average years of service of 9.8 years and average compensation of $56,365. The 2,161 active members in the prior valuation had an average age of 42.1, average service of 10.1 years and average compensation of $54,974.

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 526 members with a vested right to a deferred or immediate vested benefit or entitled to a return of their member contributions versus 500 in the prior valuation.

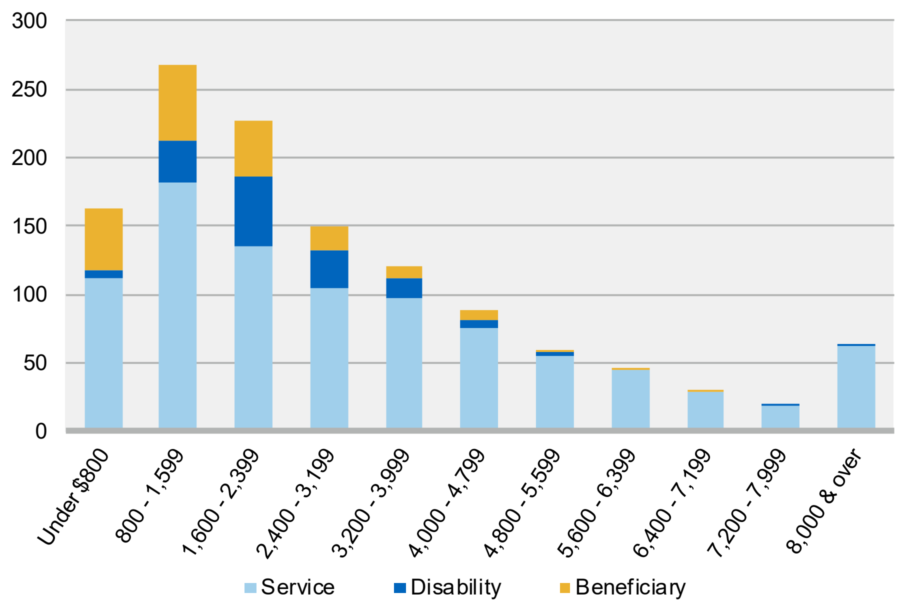
Retired Members and Beneficiaries

As of June 30, 2019, 1,054 retired members and 178 beneficiaries were receiving total monthly benefits of $3,682,960. For comparison, in the previous valuation, there were 1,016 retired members and 177 beneficiaries receiving monthly benefits of $3,464,822.

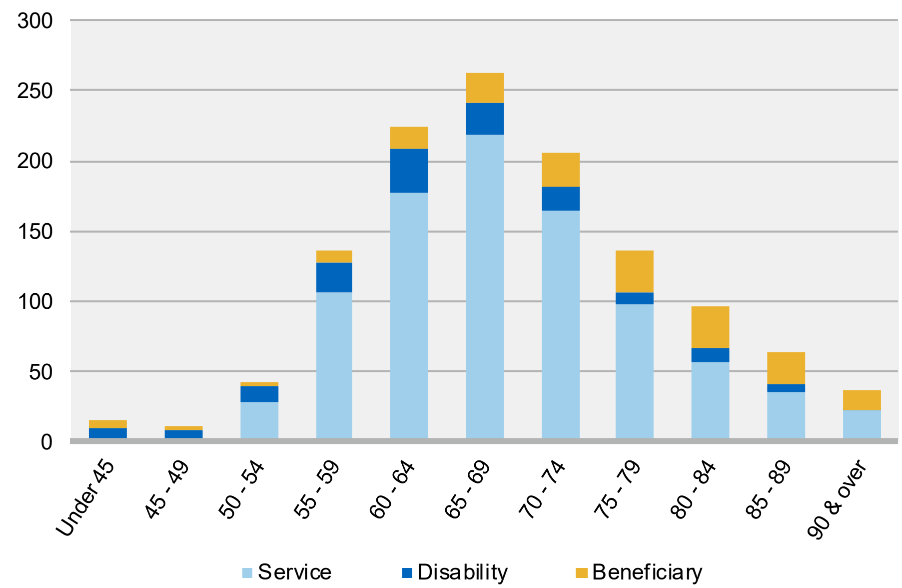
As of June 30, 2019, the average monthly benefit for retired members and beneficiaries is $2,989, compared to $2,904 in the previous valuation. The average age for retired members and beneficiaries is 69.3 in the current valuation, compared with 69.1 in the prior valuation.

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

	Active Participants			Retired Members and Beneficiaries		
Year Ended June 30	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2010	1,944	41.8	9.4	877	67.9	$2,094
2011	1,947	42.1	9.6	924	67.8	2,224
2012	1,921	42.3	9.9	977	67.7	2,306
2013	1,919	42.4	10.1	975	68.3	2,533
2014	1,987	42.2	10.1	1,007	68.8	2,598
2015	2,057	42.3	10.1	1,027	69.1	2,656
2016	2,127	42.2	10.1	1,078	69.2	2,726
2017	2,186	42.0	10.0	1,121	69.1	2,858
2018	2,161	42.1	10.1	1,193	69.1	2,904
2019	2,283	41.8	9.8	1,232	69.3	2,989

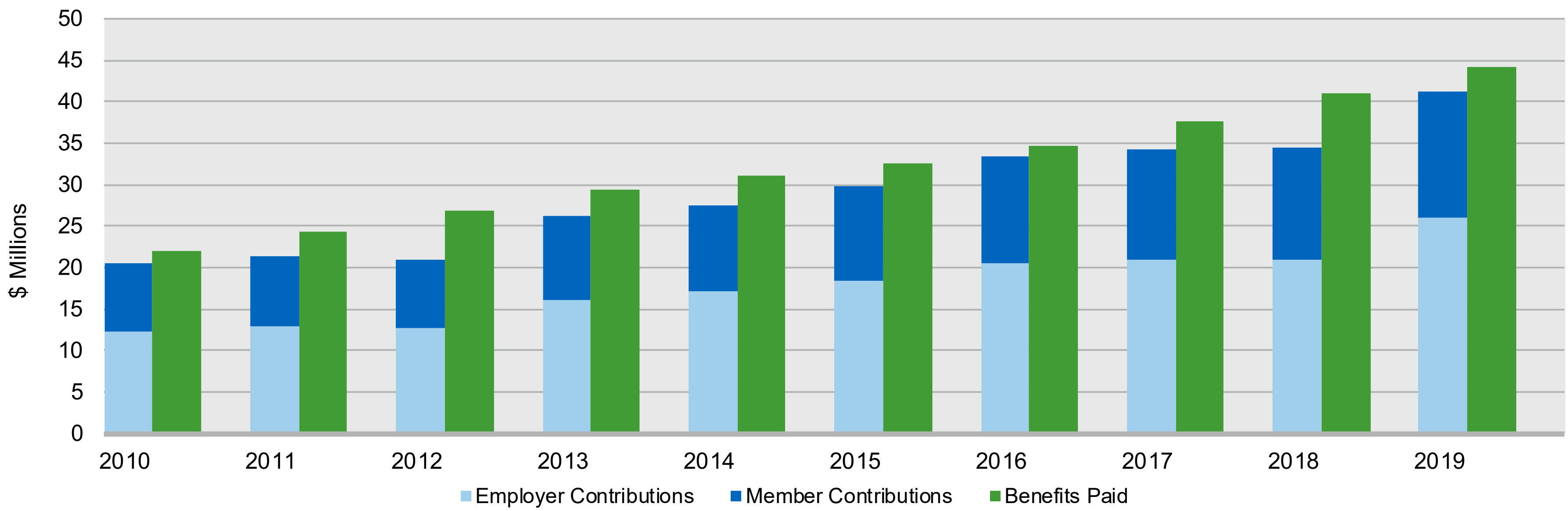
B. Financial Information

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

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

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

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



DETERMINATION OF ACTUARIAL VALUE OF ASSETS

		Actual Return	Expected Return	Investment Gain / (Loss)	Percent Deferred	Unrecognized Amount
1	Market Value of Assets					$876,015,092
2	Calculation of unrecognized return					
a)	Six months ended June 30, 2014	$32,528,614	$25,620,963	$6,907,651	0%	$0
b)	Six months ended December 31, 2014	(10,352,400)	26,817,010	(37,169,410)	0	0
c)	Six months ended June 30, 2015	21,084,669	26,361,000	(5,276,331)	10	(527,633)
d)	Six months ended December 31, 2015	(24,947,582)	26,253,854	(51,201,436)	20	(10,240,287)
e)	Six months ended June 30, 2016	26,673,765	25,251,820	1,421,945	30	426,584
f)	Six months ended December 31, 2016	26,224,337	26,163,655	60,682	40	24,273
g)	Six months ended June 30, 2017	59,548,536	27,038,927	32,509,609	50	16,254,805
h)	Six months ended December 31, 2017	53,571,926	29,132,665	24,439,261	60	14,663,557
i)	Six months ended June 30, 2018	7,587,563	30,977,537	(23,389,974)	70	(16,372,982)
j)	Six months ended December 31, 2018	(40,549,793)	30,027,491	(70,577,284)	80	(56,461,827)
k)	Six months ended June 30, 2019	90,736,513	28,455,059	62,281,454	90	56,053,309
l)	Total unrecognized return(1)					$3,819,799
3	Actuarial Value of Assets 1 – 2l					$872,195,293
4	Actuarial Value of Assets as a percentage of Market Value of Assets 3 ÷ 1					99.6%
5	Actuarial Value of Assets Corridor Limits:					
a)	Lower Limit - 70% of Market Value of Assets					$613,210,564
b)	Upper Limit - 130% of Market Value of Assets					$1,138,819,620
6	Non-valuation reserves:					
a)	Reserve for Capital Assets					$2,574,658
b)	Subtotal					$2,574,658
7	Valuation Value of Assets 3 – 6b					$869,620,635

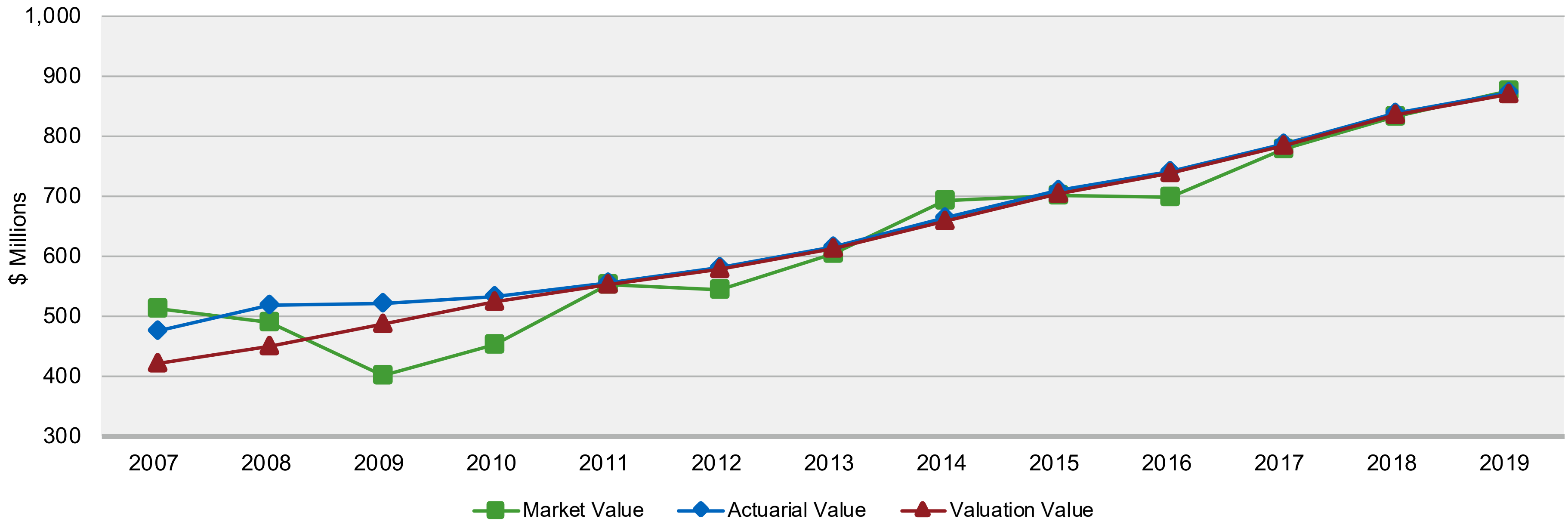
Note: Results may be slightly off due to rounding.

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

(a) Amount recognized on June 30, 2020	$(5,418,781)
(b) Amount recognized on June 30, 2021	5,206,945
(c) Amount recognized on June 30, 2022	1,801,653
(d) Amount recognized on June 30, 2023	(3,998,163)
(e) Amount recognized on June 30, 2024	6,228,145
(f) Subtotal	$3,819,799

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

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



C. Actuarial Experience

To calculate any actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the actuarially determined contribution will decrease from the previous year. On the other hand, the actuarially determined contribution will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

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

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

The net total loss is $20.7 million, which includes $20.3 million from investment losses, a net gain of $0.7 million from contribution experience and $1.1 million in losses from all other sources. The net experience variation from individual sources other than investments and contributions was 0.1% 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]	$(20,283,000)
2	Net gain from contribution experience	696,000
3	Net loss from other experience[2]	(1,103,000)
4	Net experience loss: 1 + 2 + 3	$(20,690,000)

(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 6.06% 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 2018/2019 plan year was 4.81%. 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	$50,186,720	$39,564,871	$40,064,782
2	Average value of assets	828,656,010	835,458,060	832,383,491
3	Rate of return: 1 ÷ 2	6.06%	4.74%	4.81%
4	Assumed rate of return	7.25%	7.25%	7.25%
5	Expected investment income: 2 x 4	60,077,561	60,570,709	60,347,803
6	Actuarial gain/(loss): 1 – 5	$(9,890,841)	$(21,005,838)	$(20,283,021)

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.

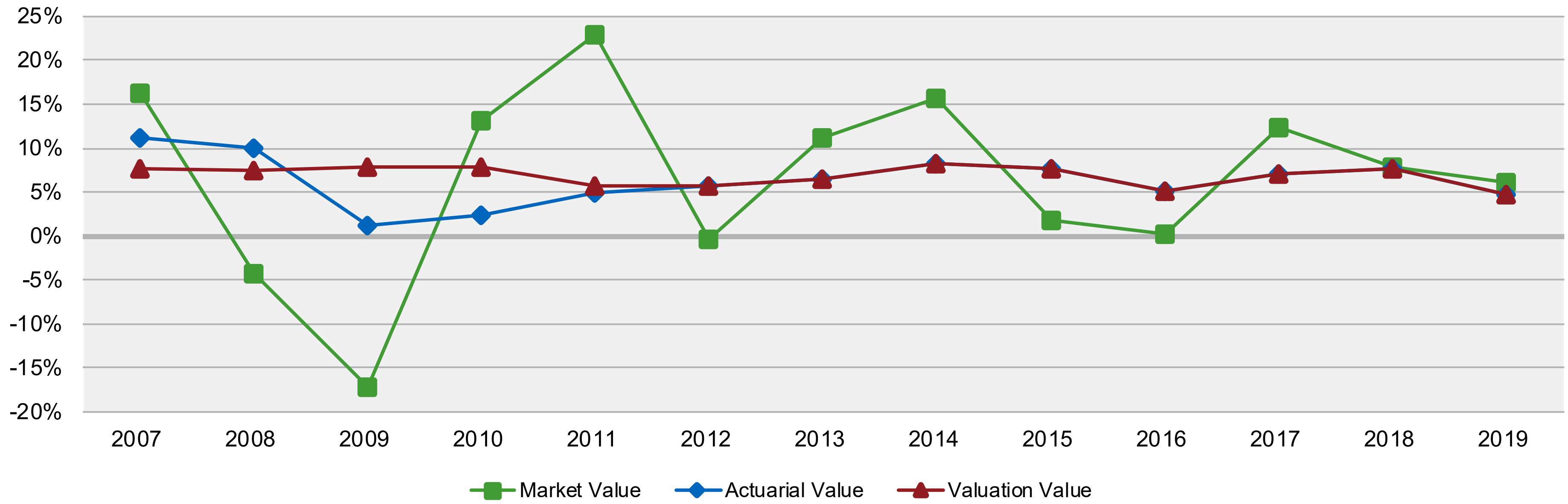
INVESTMENT RETURN – MARKET VALUE, ACTUARIAL VALUE AND VALUATION VALUE: 2010 - 2019

Year Ended June 30	Market Value Investment Return		Actuarial Value Investment Return		Valuation Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent
2010	$52,247,233	13.04%	$12,321,475	2.37%	$38,043,434	7.82%
2011	102,867,409	22.82%	25,933,294	4.89%	29,730,509	5.68%
2012	(1,690,458)	(0.31%)	31,968,680	5.79%	31,399,883	5.72%
2013	61,035,244	11.24%	37,610,549	6.49%	37,380,401	6.49%
2014	93,940,703	15.64%	51,145,482	8.33%	50,662,571	8.30%
2015[1]	12,811,880	1.86%	50,202,263	7.59%	50,521,248	7.69%
2016	1,726,183	0.25%	36,242,034	5.13%	36,294,248	5.16%
2017	85,772,873	12.32%	51,597,137	6.98%	52,109,565	7.09%
2018	61,159,489	7.89%	59,601,622	7.61%	60,114,051	7.71%
2019	50,186,720	6.06%	39,564,871	4.74%	40,064,782	4.81%
Most recent five-year geometric average return		**5.59%**		**6.40%**		**6.48%**
Most recent ten-year geometric average return		**8.86%**		**5.98%**		**6.64%**

[1] Starting with 2015, returns provide have been developed on a gross of administrative expense basis.

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

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



Contributions

Contributions for the year ended June 30, 2019 totaled $41.2 million, compared to the projected amount of $40.6 million. This resulted in a net gain of $0.7 million from contribution experience for the year, when adjusted for timing and refundability.

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 $1.1 million, which is 0.1% of the Actuarial Accrued Liability. This loss was mainly due to retirement experience and other unfavorable experience, offset to some extent by lower than expected individual salary increases for continuing active members. 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 $998.7 million, an increase of $53.3 million, or 5.6%, 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

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

Plan Provisions

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

E. Development of Unfunded Actuarial Accrued Liability

DEVELOPMENT FOR YEAR ENDED JUNE 30, 2019 ($ IN ‘000s)

1	**Unfunded Actuarial Accrued Liability at beginning of year**		**$110,174**
2	Total Normal Cost at middle of year(1)		28,915
3	Expected administrative expenses		2,139
4	Expected employer and member contributions		(40,487)
5	Interest		7,639
6	Expected Unfunded Actuarial Accrued Liability at end of year		$108,380
7	Changes due to:		
	a) Investment return less than expected after “smoothing”	$20,283	
	b) Actual contributions greater than expected(2)	(696)	
	c) Individual salary increases less than expected	(3,837)	
	d) Retirement experience loss on actives	2,926	
	e) Other experience loss	2,014	
	Total changes		$20,690
8	**Unfunded Actuarial Accrued Liability at end of year**		**$129,070**

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

(1) Excludes administrative expense load.

(2) Includes contribution gain from scheduled one-year delay in implementing lower contribution rates recommended in June 30, 2018 valuation.

(3) Other differences in actual versus expected experience include mortality, disability, and termination experience.

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 22.52% of compensation.

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

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

AVERAGE RECOMMENDED EMPLOYER CONTRIBUTION FOR YEAR ENDING JUNE 30

All Tiers Combined		2019		2018	
		Amount ($ in '000s)	% of Projected Compensation	Amount ($ in '000s)	% of Projected Compensation
1	Total Normal Cost[1]	$32,093	24.94%	$30,484	25.66%
2	Expected member Normal Cost contributions[2]	14,212	11.04%	13,392	11.27%
3	Employer Normal Cost: 1 – 2	$17,881	13.90%	$17,092	14.39%
4	Actuarial Accrued Liability	998,690		945,385	
5	Valuation Value of Assets	869,620		835,211	
6	Unfunded Actuarial Accrued Liability: 4 – 5	$129,070		$110,174	
7	Total Payment on Unfunded Actuarial Accrued Liability[1]	$12,406	9.64%	$10,152	8.55%
8	Payment on Unfunded Actuarial Accrued Liability by Member[2]	1,308	1.02%	1,408	1.19%
9	Payment on Unfunded Actuarial Accrued Liability by Employer: 7 – 8	$11,098	8.62%	$8,744	7.36%
10	Total average recommended employer contribution: 3 + 9	$28,979	22.52%	$25,836	21.75%
11	Projected compensation	$128,681		$118,800	

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

(1) Includes administrative expense load.

(2) This is the aggregate member contribution rate based on summing the contributions for each member.

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. The chart on the following page provides similar information by tier.

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

	Total Contribution Rate
Average Recommended Employer Contribution as of June 30, 2018	**21.53%**
• Effect of investment return less than expected after "smoothing"	1.22%
• Effect of actual contributions greater than expected[1]	(0.06%)
• Effect of individual salary increases less than expected	(0.23%)
• Effect of amortizing prior year's UAAL over a larger than expected projected total payroll	(0.27%)
• Effect of retirement experience loss on actives	0.17%
• Effect of demographic changes on Normal Cost	(0.03%)
• Effect of increase in the Supplemental UAAL contributions for Tier 3 members picked up by employer	0.05%
• Effect of change in allocation of administrative expenses	0.03%
• Effect of other experience losses[2]	0.11%
Total change	0.99%
Average Recommended Employer Contribution as of June 30, 2019	**22.52%**

(1) Includes contribution gain from scheduled one-year delay in implementing lower contribution rates recommended in June 30, 2018 valuation.

(2) Other differences in actual versus expected experience include mortality, disability, and termination experience.

Reconciliation of Average Recommended Employer Contribution Rate (Continued)

RECONCILIATION OF RECOMMENDED EMPLOYER CONTRIBUTION RATE BY TIER

	General Legacy	General Tier 3	General Tier 3	Safety Legacy	Safety Tier 3	Safety Tier 3	Total
		Member Pays Supplemental UAAL	Employer Picks Up Supplemental UAAL		Member Pays Supplemental UAAL	Employer Picks Up Supplemental UAAL	
Recommended Employer Contribution as of June 30, 2018	**21.46%**	**16.21%**	**16.67%**	**30.69%**	**23.42%**	**27.67%**	**21.53%**
• Effect of investment return less than expected after "smoothing"	1.09%	1.09%	1.09%	1.81%	1.81%	1.81%	1.22%
• Effect of actual contributions less/(greater) than expected[1]	(0.08%)	(0.08%)	(0.08%)	0.04%	0.04%	0.04%	(0.06%)
• Effect of individual salary increases less than expected	(0.07%)	(0.07%)	(0.07%)	(0.96%)	(0.96%)	(0.96%)	(0.23%)
• Effect of amortizing prior year's UAAL over a smaller/(larger) than expected projected total payroll	(0.37%)	(0.37%)	(0.37%)	0.17%	0.17%	0.17%	(0.27%)
• Effect of retirement experience loss/(gain) on actives	0.21%	0.21%	0.21%	(0.03%)	(0.03%)	(0.03%)	0.17%
• Effect of demographic changes on Normal Cost	(0.01%)	(0.11%)	(0.11%)	(0.01%)	0.11%	0.11%	(0.03%)
• Effect of increase in the Supplemental UAAL contributions for Tier 3 members picked up by employer	0.00%	0.00%	0.10%	0.00%	0.00%	0.54%	0.05%
• Effect of change in allocation of administrative expenses	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
• Effect of other experience losses[2]	0.12%	0.12%	0.12%	0.11%	0.10%	0.10%	0.11%
Total change	0.92%	0.82%	0.92%	1.16%	1.27%	1.81%	0.99%
Recommended Employer Contribution as of June 30, 2019	**22.38%**	**17.03%**	**17.59%**	**31.85%**	**24.69%**	**29.48%**	**22.52%**

[1] Includes contribution gain from scheduled one-year delay in implementing lower contribution rates recommended in June 30, 2018 valuation.

[2] Other differences in actual versus expected experience include mortality, disability, and termination experience.

Reconciliation of Average Recommended Member Contribution Rate

The chart below details the changes in the average recommended member contribution rate from the prior valuation to the current year's valuation. The chart on the following page provides similar information by tier.

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

	Total Contribution Rate
Average Recommended Member Contribution as of June 30, 2018[1]	**12.13%**
• Effect of investment return less than expected after "smoothing"	0.12%
• Effect of actual contributions greater than expected[2]	0.00%
• Effect of individual salary increases less than expected	(0.03%)
• Effect of amortizing prior year's UAAL over a larger than expected projected total payroll	(0.01%)
• Effect of retirement experience loss on actives	0.02%
• Effect of demographic changes on Normal Cost	(0.03%)
• Effect of change in allocation of administrative expenses	(0.03%)
• Effect of other experience losses[3]	0.04%
Total change	0.08%
Average Recommended Member Contribution as of June 30, 2019[1]	**12.21%**

(1) The aggregate member rates are based on average entry age of 33 and 28 for General Legacy and Safety Legacy, respectively.

(2) Includes contribution gain from scheduled one-year delay in implementing lower contribution rates recommended in June 30, 2018 valuation.

(3) Other differences in actual versus expected experience include mortality, disability, and termination experience.

Reconciliation of Average Recommended Member Contribution Rate (Continued)

RECONCILIATION OF RECOMMENDED MEMBER CONTRIBUTION RATE BY TIER

	General Legacy	General Tier 3 Member Pays Supplemental UAAL	General Tier 3 Employer Picks Up Supplemental UAAL	Safety Legacy	Safety Tier 3 Member Pays Supplemental UAAL	Safety Tier 3 Employer Picks Up Supplemental UAAL	Total
Recommended Member Contribution as of June 30, 2018[1]	**10.85%**	**9.85%**	**9.34%**	**22.84%**	**19.02%**	**14.40%**	**12.13%**
• Effect of investment return less than expected after "smoothing"	0.12%	0.12%	N/A	0.38%	0.38%	N/A	0.12%
• Effect of actual contributions less/(greater) than expected[2]	0.00%	0.00%	N/A	0.04%	0.04%	N/A	0.00%
• Effect of individual salary increases less than expected	0.00%	0.00%	N/A	(0.21%)	(0.21%)	N/A	(0.03%)
• Effect of amortizing prior year's UAAL over a smaller/(larger) than expected projected total payroll	(0.03%)	(0.03%)	N/A	0.09%	0.09%	N/A	(0.01%)
• Effect of retirement experience loss/(gain) on actives	(0.01%)	(0.01%)	N/A	0.23%	0.23%	N/A	0.02%
• Effect of demographic changes on Normal Cost	0.00%	(0.11%)	(0.11%)	0.01%	0.11%	0.11%	(0.03%)
• Effect of change in allocation of administrative expenses	(0.03%)	(0.03%)	(0.03%)	(0.03%)	(0.03%)	(0.03%)	(0.03%)
• Effect of other experience losses[3]	0.03%	0.03%	0.00%	0.06%	0.06%	0.00%	0.04%
Total change	0.08%	(0.03%)	(0.14%)	0.57%	0.67%	0.08%	0.08%
Recommended Member Contribution as of June 30, 2019[1]	**10.93%**	**9.82%**	**9.20%**	**23.41%**	**19.69%**	**14.48%**	**12.21%**

(1) The aggregate member rates are based on average entry age of 33 and 28 for General Legacy and Safety Legacy, respectively.

(2) Includes contribution gain from scheduled one-year delay in implementing lower contribution rates recommended in June 30, 2018 valuation.

(3) Other differences in actual versus expected experience include mortality, disability, and termination experience.

Recommended Employer Contribution Rates

	June 30, 2019 Actuarial Valuation[1] Recommended Rates for FY 2020-21				June 30, 2018 Actuarial Valuation[2] Recommended Rates for FY 2019-20			
	Basic	COLA	Total	Estimated Annual Dollar Amount[3] ($ in '000s)	Basic	COLA	Total	Estimated Annual Dollar Amount[3] ($ in '000s)
General Legacy								
Normal Cost	12.71%	1.84%	14.55%	$9,979	12.76%	1.83%	14.59%	$10,007
UAAL	3.65%	4.18%	7.83%	5,370	2.74%	4.13%	6.87%	4,712
Total Contributions	16.36%	6.02%	22.38%	$15,349	15.50%	5.96%	21.46%	$14,719
General Tier 3 (Member Pays Supplemental UAAL)								
Normal Cost	7.68%	1.52%	9.20%	$404	7.81%	1.53%	9.34%	$410
UAAL	3.65%	4.18%	7.83%	343	2.74%	4.13%	6.87%	301
Total Contributions	11.33%	5.70%	17.03%	$747	10.55%	5.66%	16.21%	$711
General Tier 3 (Employer Picks Up Supplemental UAAL)								
Normal Cost	7.68%	1.52%	9.20%	$3,041	7.81%	1.53%	9.34%	$3,087
UAAL	4.08%	4.31%	8.39%	2,773	3.10%	4.23%	7.33%	2,422
Total Contributions	11.76%	5.83%	17.59%	$5,814	10.91%	5.76%	16.67%	$5,509
Safety Legacy[4]								
Normal Cost	18.51%	3.13%	21.64%	$3,554	18.56%	3.11%	21.67%	$3,558
UAAL[5]	3.94%	6.27%	10.21%	1,677	3.26%	5.76%	9.02%	1,481
Total Contributions	22.45%	9.40%	31.85%	$5,231	21.82%	8.87%	30.69%	$5,039
Safety Tier 3 (Member Pays Supplemental UAAL)								
Normal Cost	11.68%	2.80%	14.48%	$0	11.63%	2.77%	14.40%	$0
UAAL	3.94%	6.27%	10.21%	0	3.26%	5.76%	9.02%	0
Total Contributions	15.62%	9.07%	24.69%	$0	14.89%	8.53%	23.42%	$0
Safety Tier 3 (Employer Picks Up Supplemental UAAL)								
Normal Cost	11.68%	2.80%	14.48%	$903	11.63%	2.77%	14.40%	$898
UAAL	7.49%	7.51%	15.00%	935	6.42%	6.85%	13.27%	827
Total Contributions	19.17%	10.31%	29.48%	$1,838	18.05%	9.62%	27.67%	$1,725

Recommended Employer Contribution Rates (continued)

	June 30, 2019 Actuarial Valuation[(1)] Recommended Rates for FY 2020-21				June 30, 2018 Actuarial Valuation[(2)] Recommended Rates for FY 2019-20			
	Basic	COLA	Total	Estimated Annual Dollar Amount[(3)] ($ in '000s)	Basic	COLA	Total	Estimated Annual Dollar Amount[(3)] ($ in '000s)
All Categories Combined								
Normal Cost	11.94%	1.96%	13.90%	$17,881	12.01%	1.95%	13.96%	$17,960
UAAL	3.98%	4.64%	8.62%	11,098	3.08%	4.49%	7.57%	9,743
Total Contributions	15.92%	6.60%	22.52%	$28,979	15.09%	6.44%	21.53%	$27,703

(1) The Basic Normal Cost and UAAL rates shown for each cost group as of June 30, 2019 include an explicit administrative expense of 0.63% and 0.54% of payroll, respectively.

(2) The Basic Normal Cost and UAAL rates shown for each cost group as of June 30, 2018 include an explicit administrative expense of 0.66% and 0.48% of payroll, respectively.

(3) Amounts are in thousands and are based on June 30, 2019 projected annual compensation shown as follows:

	Legacy ($ in '000s)	Tier 3 (Member Pays Supplemental UAAL) ($ in '000s)	Tier 3 (Employer Picks up Supplemental UAAL) ($ in '000s)	Total ($ in '000s)
General	$68,587	$4,386	$33,054	$106,027
Safety	$16,421	$0	$6,233	$22,654
Total	$85,008	$4,386	$39,287	$128,681

(4) Includes pickup of member contributions of 0.03% Normal Cost and 0.02% UAAL associated with the Supplemental benefit for a member who has attained 30 years of service as of June 30, 2019. A similar adjustment has also been made to the Normal Cost for the Regular benefit.

(5) The UAAL Total Rate associated with the Safety Supplemental UAAL Relief is 1.08% as of June 30, 2019 and 1.06% as of June 30, 2018.

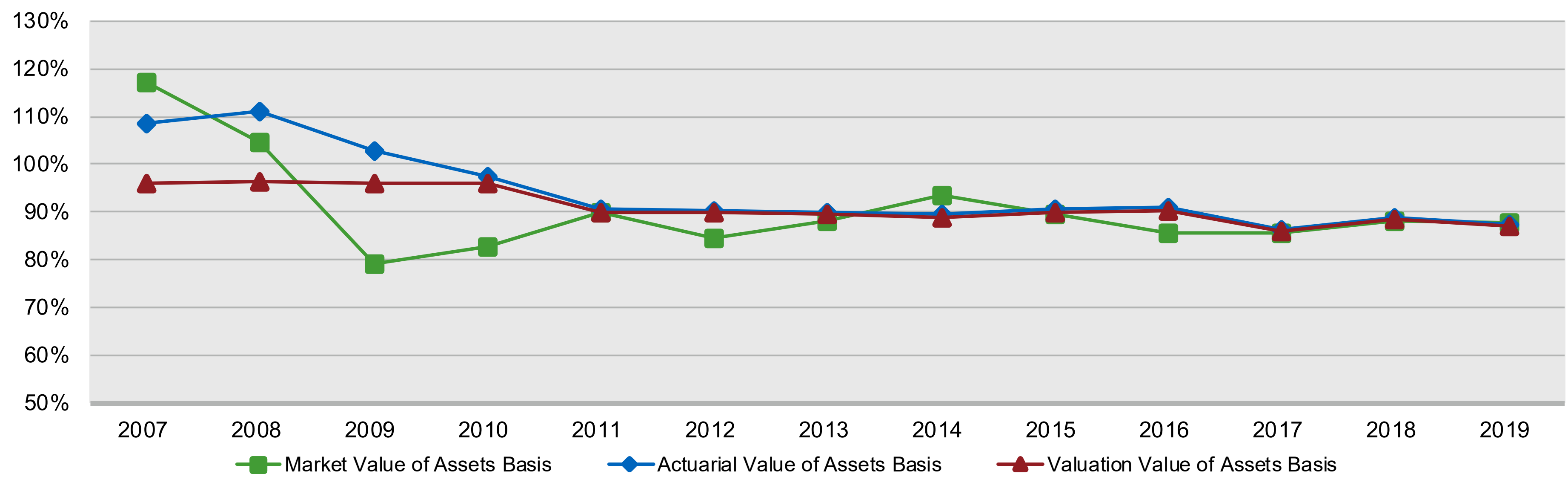
G. Funded Status

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

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

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

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



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

Actuarial Valuation Date as of June 30	Valuation Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (%) (a) / (b)	Projected Covered Payroll (c)	UAAL as a Percentage of Projected Covered Payroll (%) [(b) - (a)] / (c)
2010	$524,522,000	$546,342,000	$21,820,000	96.0%	$98,085,000	22.2%
2011	552,209,000	613,584,000	61,375,000	90.0%	101,610,000	60.4%
2012	577,753,000	643,322,000	65,569,000	89.8%	100,356,000	65.3%
2013	611,989,000	684,303,000	72,314,000	89.4%	102,548,000	70.5%
2014	659,148,000	741,242,000	82,094,000	88.9%	105,731,000	77.6%
2015	704,758,000	782,840,000	78,082,000	90.0%	112,465,000	69.4%
2016	737,506,000	816,442,000	78,936,000	90.3%	115,443,000	68.4%
2017	783,848,000	910,321,000	126,473,000	86.1%	119,934,000	105.5%
2018	835,211,000	945,385,000	110,174,000	88.3%	118,800,000	92.7%
2019	869,621,000	998,690,000	129,070,000	87.1%	128,681,000	100.3%

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

	Regular & Tier 3 ($ in '000s)	Supplemental ($ in '000s)	Total ($ in '000s)
Actuarial Present Value of Future Benefits			
• Present value of benefits for retired members and beneficiaries	$477,411	$52,735	$530,146
• Present value of benefits for inactive vested members	36,998	4,783	41,781
• Present value of benefits for active members	635,177	63,328	698,505
Total Actuarial Present Value of Future Benefits	**$1,149,586**	**$120,846**	**$1,270,432**
Current and future assets			
• Total Valuation Value of Assets	$788,961	$80,659	$869,620
• Present value of future contributions by members			
» Entry age Normal Cost	116,780	20,114	136,894
» Unfunded Actuarial Accrued Liability	0	17,731	17,731
• Present value of future employer contributions for:			
» Entry age Normal Cost	134,848	0(1)	134,848
» Unfunded Actuarial Accrued Liability	108,997	2,342(1)	111,339
Total of current and future assets	**$1,149,586**	**$120,846**	**$1,270,432**

(1) Before taking into consideration employer pickup of member contributions after Safety Legacy members have attained 30 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 6.8. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 6.8% of one year's payroll. Since actuarial gains and losses are amortized over 15 years, there would be a 0.6% 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 7.8, but is 6.9 for General compared to 11.9 for Safety. This means, for example, that assumption changes will have a greater impact on employer contribution rates for Safety than for General.

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

VOLATILITY RATIOS FOR YEARS ENDED JUNE 30, 2010 – 2019

Year Ended June 30	Asset Volatility Ratio			Liability Volatility Ratio		
	General	Safety	Total	General	Safety	Total
2010	N/A	N/A	4.6	5.0	8.1	5.6
2011	N/A	N/A	5.4	5.4	8.9	6.0
2012	4.9	7.9	5.4	5.7	9.5	6.4
2013	5.3	8.3	5.9	6.0	9.6	6.7
2014	5.9	9.3	6.6	6.3	10.3	7.0
2015	5.6	8.9	6.2	6.2	10.2	7.0
2016	5.4	8.8	6.1	6.3	10.6	7.1
2017	5.9	9.3	6.5	6.8	11.0	7.6
2018	6.3	10.0	7.0	7.1	11.5	8.0
2019	6.0	10.4	6.8	6.9	11.9	7.8

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 System's staff regarding specific content for a more detailed analysis of the potential range of the impact of risk relative to the System'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 risks such as longevity, which affect 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 6.8% of one-year's payroll. Since actuarial gains and losses are amortized over 15 years, there would be a 0.6% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

The single year market value rate of return over the last 10 years has ranged from a low of -0.31% to a high of 22.82%.

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

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

- 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 96.0% to 87.1%. 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 6.64%. This includes a high of an 8.30% return and a low of 4.81%. The average over the last 5 years was 6.48%. For more details see the Investment Return table in *Section 2, Subsection C* on page 24.

- The primary source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption changes in 2014 reduced the discount rate from 7.75% to 7.50% and updated mortality tables, adding $21.6 million in unfunded liability. The assumption changes in 2017 reduced the discount rate from 7.50% to 7.25% and again updated mortality tables, adding $46.7 million in unfunded liability. For more details on the unfunded liability changes see *Section 3, Exhibit H, Table of Amortization Bases* starting on page 59.
- 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 64 and 65.

Maturity Measures

In the last 10 years the ratio of members in pay status to active participants has increased from 0.45 to 0.54. 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 $2.9 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.

EXHIBIT A – TABLE OF PLAN COVERAGE
TOTAL PLAN

Category	Year Ended June 30		Change From Prior Year
	2019[1]	2018[2]	
Active members in valuation:			
• Number	2,283	2,161	5.6%
• Average age	41.8	42.1	-0.3
• Average years of service	9.8	10.1	-0.3
• Total projected compensation	$128,680,972	$118,799,245	8.3%
• Average projected compensation	$56,365	$54,974	2.5%
• Account balances	$124,242,231	$115,998,234	7.1%
Inactive vested members:			
• Number	526	500	5.2%
• Average age	43.0	42.9	0.1
Retired members:			
• Number in pay status	912	878	3.9%
• Average age	69.1	69.0	0.1
• Average monthly benefit	$3,328	$3,235	2.9%
Disabled members:			
• Number in pay status	142	138	2.9%
• Average age	64.0	63.2	0.8
• Average monthly benefit	$2,413	$2,310	4.5%
Beneficiaries:			
• Number in pay status	178	177	0.6%
• Average age	74.2	74.5	-0.3
• Average monthly benefit	$1,716	$1,729	-0.8%

(1) Includes 145 active members, 28 inactive vested members, 64 retired members, 24 disabled members, and 10 beneficiaries with service from both the General and Safety Tiers.

(2) Includes 147 active members, 28 inactive vested members, 61 retired members, 23 disabled members, and 9 beneficiaries with service from both the General and Safety Tiers.

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

Category	Year Ended June 30 2019[1]	Year Ended June 30 2018[2]	Change From Prior Year
Active members in valuation:			
• Number	1,102	1,163	-5.2%
• Average age	47.7	47.0	0.7
• Average years of service	15.2	14.5	0.7
• Total projected compensation	$68,586,648	$68,812,036	-0.3%
• Average projected compensation	$62,238	$59,168	5.2%
• Account balances	$76,672,807	$73,484,329	4.3%
Inactive vested members:			
• Number	321	321	0.0%
• Average age	46.2	46.0	0.2
Retired members:			
• Number in pay status	744	717	3.8%
• Average age	70.0	69.9	0.1
• Average monthly benefit	$2,975	$2,887	3.0%
Disabled members:			
• Number in pay status	70	69	1.4%
• Average age	67.7	66.5	1.2
• Average monthly benefit	$1,851	$1,739	6.4%
Beneficiaries:			
• Number in pay status	146	146	0.0%
• Average age	75.4	75.7	-0.3
• Average monthly benefit	$1,587	$1,595	-0.5%

(1) Includes 7 active members, 1 inactive vested member, 4 retired members, 2 disabled members, and 2 beneficiaries with service from both the General and Safety Legacy Tiers.

(2) Includes 8 active members, 1 inactive vested member, 5 retired members, 2 disabled members, and 2 beneficiaries with service from both the General and Safety Legacy Tiers.

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

Category	Year Ended June 30		Change From Prior Year
	2019[1]	2018[2]	
Active members in valuation:			
• Number	834	654	27.5%
• Average age	35.5	35.5	0.0
• Average years of service	2.6	2.4	0.2
• Total projected compensation	$37,440,158	$27,675,625	35.3%
• Average projected compensation	$44,892	$42,317	6.1%
• Account balances	$8,530,758	$5,609,466	52.1%
Inactive vested members:			
• Number	130	109	19.3%
• Average age	36.8	35.9	0.9
Retired members:			
• Number in pay status	2	1	100.0%
• Average age	69.2	69.2	0.0
• Average monthly benefit	$1,105	$955	15.7%
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

[1] Includes 4 active members with service from both the General and Safety Tiers 3.

[2] Includes 3 active members with service from both the General and Safety Tiers 3.

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

Category	Year Ended June 30: 2019[1]	Year Ended June 30: 2018[2]	Change From Prior Year
Active members in valuation:			
• Number	226	243	-7.0%
• Average age	42.3	41.5	0.8
• Average years of service	14.2	13.4	0.8
• Total projected compensation	$16,421,029	$17,243,711	-4.8%
• Average projected compensation	$72,659	$70,962	2.4%
• Account balances	$36,204,089	$35,060,796	3.3%
Inactive vested members:			
• Number	64	60	6.7%
• Average age	41.0	40.3	0.7
Retired members:			
• Number in pay status	166	160	3.8%
• Average age	65.5	65	0.5
• Average monthly benefit	$4,937	$4,807	2.7%
Disabled members:			
• Number in pay status	72	69	4.3%
• Average age	60.5	59.9	0.6
• Average monthly benefit	$2,960	$2,882	2.7%
Beneficiaries:			
• Number in pay status	32	31	3.2%
• Average age	68.6	68.8	-0.2
• Average monthly benefit	$2,303	$2,361	-2.5%

(1) Includes 103 active members, 24 inactive vested members, 60 retired members, 22 disabled members, and 8 beneficiaries with service from both the General and Safety Legacy Tiers.

(2) Includes 111 active members, 24 inactive vested members, 56 retired members, 21 disabled members and 7 beneficiaries with service from both the General and Safety Legacy Tiers.

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

Category	Year Ended June 30 2019[1]	Year Ended June 30 2018[2]	Change From Prior Year
Active members in valuation:			
• Number	121	101	19.8%
• Average age	30.6	29.9	0.7
• Average years of service	2.9	2.3	0.6
• Total projected compensation	$6,233,137	$5,067,874	23.0%
• Average projected compensation	$51,514	$50,177	2.7%
• Account balances	$2,834,576	$1,843,643	53.7%
Inactive vested members:			
• Number	11	10	10.0%
• Average age	34.2	33.4	0.8
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

[1] Includes 31 active members and 3 inactive vested members with service from both General and Safety Tiers 3.

[2] Includes 25 active members and 3 inactive vested members with service from both General and Safety Tiers 3.

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	75	75	- -	- -	- -	- -	- -	- -	- -	- -
	$36,009	$36,009	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	258	233	25	- -	- -	- -	- -	- -	- -	- -
	42,709	41,323	$55,625	- -	- -	- -	- -	- -	- -	- -
30 - 34	376	227	105	44	- -	- -	- -	- -	- -	- -
	49,563	44,487	57,152	$57,643	- -	- -	- -	- -	- -	- -
35 - 39	405	141	97	143	24	- -	- -	- -	- -	- -
	57,942	49,558	57,372	65,503	$64,457	- -	- -	- -	- -	- -
40 - 44	359	77	57	116	94	14	1	- -	- -	- -
	60,597	50,581	58,293	61,335	66,586	$69,091	$195,464	- -	- -	- -
45 - 49	265	37	29	69	79	41	10	- -	- -	- -
	61,950	44,757	59,996	57,286	64,651	76,704	81,579	- -	- -	- -
50 - 54	215	22	27	40	50	31	37	7	1	- -
	62,481	49,056	69,625	51,766	58,989	79,948	67,283	$61,841	$53,552	- -
55 - 59	183	25	19	45	32	31	22	7	2	- -
	63,054	53,384	51,025	60,630	56,050	66,099	86,904	84,320	80,816	- -
60 - 64	105	9	11	26	25	17	8	5	3	1
	64,313	45,085	60,397	62,695	55,539	72,914	93,553	90,511	52,682	$65,580
65 - 69	35	4	1	16	6	3	3	1	- -	1
	70,546	74,443	102,001	63,345	64,202	51,366	104,451	135,644	- -	67,505
70 & over	7	- -	1	2	2	1	1	- -	- -	- -
	70,541	- -	$66,906	50,261	55,447	84,067	131,399	- -	- -	- -
Total	**2,283**	**850**	**372**	**501**	**312**	**138**	**82**	**20**	**6**	**2**
	$56,365	**$44,804**	**$58,338**	**$60,906**	**$62,632**	**$73,314**	**$80,558**	**$80,566**	**$62,205**	**$66,543**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
GENERAL LEGACY 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	7	- -	7	- -	- -	- -	- -	- -	- -	- -
	$54,734	- -	$54,734	- -	- -	- -	- -	- -	- -	- -
30 - 34	82	5	53	24	- -	- -	- -	- -	- -	- -
	52,908	$52,623	53,746	$51,117	- -	- -	- -	- -	- -	- -
35 - 39	180	3	54	104	19	- -	- -	- -	- -	- -
	61,785	64,810	60,119	62,923	$59,808	- -	- -	- -	- -	- -
40 - 44	216	2	33	99	70	11	1	- -	- -	- -
	61,416	58,643	53,927	59,793	63,906	$70,961	$195,464	- -	- -	- -
45 - 49	176	1	21	60	58	28	8	- -	- -	- -
	62,311	92,315	61,254	55,661	60,993	73,491	81,630	- -	- -	- -
50 - 54	169	1	15	38	47	26	34	7	1	- -
	63,424	56,591	75,147	51,271	58,593	81,634	65,405	$61,841	$53,552	- -
55 - 59	146	1	14	43	32	27	21	6	2	- -
	64,749	163,198	52,977	58,479	56,050	64,520	86,449	86,866	80,816	- -
60 - 64	91	- -	9	25	25	16	7	5	3	1
	65,543	- -	59,891	60,072	55,539	73,831	96,803	90,511	52,682	$65,580
65 - 69	29	- -	1	14	6	3	3	1	- -	1
	66,842	- -	102,001	55,759	64,202	51,366	104,451	135,644	- -	67,505
70 & over	6	- -	1	1	2	1	1	- -	- -	- -
	72,744	- -	66,906	43,200	55,447	84,067	131,399	- -	- -	- -
Total	**1,102**	**13**	**208**	**408**	**259**	**112**	**75**	**19**	**6**	**2**
	$62,238	**$68,226**	**$58,273**	**$58,379**	**$60,152**	**$72,520**	**$80,134**	**$81,173**	**$62,205**	**$66,543**

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

	Years of Service									
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	60	60	- -	- -	- -	- -	- -	- -	- -	- -
	$33,747	$33,747	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	197	187	10	- -	- -	- -	- -	- -	- -	- -
	39,754	39,082	$52,321	- -	- -	- -	- -	- -	- -	- -
30 - 34	221	197	24	- -	- -	- -	- -	- -	- -	- -
	45,038	43,608	56,776	- -	- -	- -	- -	- -	- -	- -
35 - 39	154	123	31	- -	- -	- -	- -	- -	- -	- -
	48,615	48,445	49,285	- -	- -	- -	- -	- -	- -	- -
40 - 44	88	71	16	1	- -	- -	- -	- -	- -	- -
	52,606	49,644	66,401	$42,172	- -	- -	- -	- -	- -	- -
45 - 49	40	34	6	- -	- -	- -	- -	- -	- -	- -
	44,604	43,500	50,863	- -	- -	- -	- -	- -	- -	- -
50 - 54	31	21	10	- -	- -	- -	- -	- -	- -	- -
	50,958	48,697	55,706	- -	- -	- -	- -	- -	- -	- -
55 - 59	30	24	5	1	- -	- -	- -	- -	- -	- -
	51,607	48,808	45,560	149,016	- -	- -	- -	- -	- -	- -
60 - 64	10	9	1	- -	- -	- -	- -	- -	- -	- -
	46,136	45,085	55,589	- -	- -	- -	- -	- -	- -	- -
65 - 69	3	3	- -	- -	- -	- -	- -	- -	- -	- -
	47,010	47,010	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**834**	**729**	**103**	**2**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$44,892	**$43,384**	**$54,580**	**$95,594**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
SAFETY LEGACY 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	5	1	4	- -	- -	- -	- -	- -	- -	- -
	$60,283	$65,381	$59,009	- -	- -	- -	- -	- -	- -	- -
30 - 34	37	- -	17	20	- -	- -	- -	- -	- -	- -
	64,817	- -	64,043	$65,475	- -	- -	- -	- -	- -	- -
35 - 39	54	1	9	39	5	- -	- -	- -	- -	- -
	72,703	77,057	68,382	72,380	$82,127	- -	- -	- -	- -	- -
40 - 44	53	3	7	16	24	3	- -	- -	- -	- -
	71,091	68,295	62,471	72,079	74,403	$62,234	- -	- -	- -	- -
45 - 49	47	- -	2	9	21	13	2	- -	- -	- -
	76,193	- -	74,176	68,114	74,753	83,626	$81,372	- -	- -	- -
50 - 54	15	- -	2	2	3	5	3	- -	- -	- -
	75,679	- -	97,804	61,170	65,206	71,182	88,569	- -	- -	- -
55 - 59	7	- -	- -	1	- -	4	1	1	- -	- -
	76,756	- -	- -	64,760	- -	76,760	96,448	$69,041	- -	- -
60 - 64	4	- -	1	1	- -	1	1	- -	- -	- -
	81,770	- -	69,759	128,276	- -	58,244	70,803	- -	- -	- -
65 - 69	3	1	- -	2	- -	- -	- -	- -	- -	- -
	129,883	156,742	- -	116,453	- -	- -	- -	- -	- -	- -
70 & over	1	- -	- -	1	- -	- -	- -	- -	- -	- -
	57,321	- -	- -	57,321	- -	- -	- -	- -	- -	- -
Total	**226**	**6**	**42**	**91**	**53**	**26**	**7**	**1**	**- -**	**- -**
	$72,659	**$84,011**	**$66,458**	**$71,475**	**$74,750**	**$76,732**	**$85,100**	**$69,041**	**- -**	**- -**

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

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	15	15	- -	- -	- -	- -	- -	- -	- -	- -
	$45,059	$45,059	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	49	45	4	- -	- -	- -	- -	- -	- -	- -
	51,076	50,100	$62,060	- -	- -	- -	- -	- -	- -	- -
30 - 34	36	25	11	- -	- -	- -	- -	- -	- -	- -
	54,049	49,790	63,730	- -	- -	- -	- -	- -	- -	- -
35 - 39	17	14	3	- -	- -	- -	- -	- -	- -	- -
	54,869	54,097	58,472	- -	- -	- -	- -	- -	- -	- -
40 - 44	2	1	1	- -	- -	- -	- -	- -	- -	- -
	45,623	47,874	43,372	- -	- -	- -	- -	- -	- -	- -
45 - 49	2	2	- -	- -	- -	- -	- -	- -	- -	- -
	42,354	42,354	- -	- -	- -	- -	- -	- -	- -	- -
50 - 54	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
55 - 59	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
60 - 64	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
65 - 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**121**	**102**	**19**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$51,514	**$49,658**	**$61,477**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

EXHIBIT C – RECONCILIATION OF MEMBER DATA

	Active Members	Inactive Vested Members	Retired Members	Disabled Members	Beneficiaries	Total
Number as of June 30, 2018	**2,161**	**500**	**878**	**138**	**177**	**3,854**
• New members	269	7	N/A	N/A	N/A	276
• Terminations	(51)	51	N/A	N/A	N/A	0
• Contribution refunds	(51)	(17)	N/A	N/A	N/A	(68)
• Retirements	(42)	(12)	54	N/A	N/A	0
• New disabilities	(5)	0	(1)	6	N/A	0
• Return to work	3	(3)	0	0	N/A	0
• Died with or without beneficiary	(1)	0	(20)	(2)	1[(1)]	(22)
• Data adjustments	0	0	1	0	0	1
Number as of June 30, 2019	**2,283**	**526**	**912**	**142**	**178**	**4,041**

(1) This is the net increase in the number of beneficiaries after subtracting the number of beneficiaries who died during the year.

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

	Year Ended June 30, 2019		Year Ended June 30, 2018	
Net assets at market value at the beginning of the year		**$831,483,648**		**$779,074,836**
Contribution income:				
• Employer contributions	$26,078,469		$21,014,523	
• Member contributions	15,085,120		13,405,766	
• Less administrative expenses	(2,736,486)		(2,224,214)	
Net contribution income		$38,427,103		$32,196,075
Investment income:				
• Interest, dividends, asset appreciation and other income	$54,308,833		$64,360,014	
• Less investment fees	(4,122,111)		(3,200,525)	
Net investment income		$50,186,720		$61,159,489
Total income available for benefits		**$88,613,825**		**$93,355,564**
Less benefit payments:				
• Service retirement	$(42,553,359)		$(39,951,343)	
• Death payments	(157,159)		(88,750)	
• Member refunds	(1,371,863)		(906,659)	
Net benefit payments		$(44,082,381)		$(40,946,752)
Change in net assets at market value		**$44,531,444**		**$52,408,812**
Net assets at market value at the end of the year		**$876,015,092**		**$831,483,648**

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		$4,043,107		$5,083,669
Capital Assets		$2,574,658		$3,074,569
Accounts receivable:				
• Contributions	$1,309,364		$1,112,595	
• Interest and dividends	275,605		663,326	
• Sale of investments	114,579		8,585,517	
• Others	23,916		69,485	
Total accounts receivable		$1,723,464		$10,430,923
Investments:				
• Fixed income	$242,751,321		$220,843,540	
• Equities	475,773,422		475,409,205	
• Alternative	54,484,910		41,611,794	
• Real estate	95,781,690		76,495,528	
Total investments at market value		$868,791,343		$814,360,067
Total assets		$877,132,572		$832,949,228
Accounts payable:				
• Investment payables	$(889,490)		$(1,406,579)	
• Others	(227,990)		(59,001)	
Total accounts payable		$(1,117,480)		$(1,465,580)
Net assets at market value		**$876,015,092**		**$831,483,648**
Net assets at actuarial value		**$872,195,293**		**$838,285,698**
Net assets at valuation value		**$869,620,635**		**$835,211,129**

Note: Results may be slightly off due to rounding.

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

	Regular & Tier 3 Reserves	Supplemental Reserves	Total Reserves
Used in Development of Valuation Value of Assets:			
• Members' deposit reserves	$138,779,650	$40,522,378	$179,302,028
• Employer's advance reserves	358,564,217	6,967,708	365,531,925
• Service pension reserves (members' contributions)	105,104,286	7,545,135	112,649,421
• Service pension reserves (employer's contributions)	256,066,017	31,119,240	287,185,257
• Disability pension reserves (members' contributions)	3,896,462	1,352,815	5,249,277
• Disability pension reserves (employer's contributions)	20,926,121	2,465,193	23,391,314
• Survivors' death benefit reserve	6,434,354	403,245	6,837,599
• Death benefit reserve	2,889,393	0	2,889,393
Subtotal	892,660,500	$90,375,714	$983,036,214
Contingency reserve[1]			$(113,415,579)
Subtotal: Valuation Value of Assets			$869,620,635
Not Used in Development of Valuation Value of Assets:			
• Member and retiree non-valuation reserves			$0
• Employee benefit enhancement			0
• Employee COLA contribution relief			0
• Unallocated earnings			0
• Fixed asset reserve			0
• Retiree health insurance premiums			0
• Reserve for Capital Assets			2,574,658
• Miscellaneous			0
Subtotal			$2,574,658
Subtotal: Actuarial Value of Assets			$872,195,293
• Market Stabilization Reserve			$3,819,799
Total: Market Value of Assets			**$876,015,092**

Note: Results may be slightly off due to rounding.

[1] If Contingency Reserve is negative, it is applied as an offset that reduces value of the reserves that are included in the Valuation Value of Assets used in the valuation.

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

Year Ended June 30	Employer Contributions	Member Contributions	Administrative Expenses	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	$12,351,303[2]	$8,233,664	$0	$52,247,233	$22,102,173	$452,137,539	$524,521,867	116.01%
2011	12,982,633	8,460,354	0	102,867,409	24,240,745	552,207,190	552,208,618	100.00%
2012	12,673,237	8,297,628	0	(1,690,458)	26,826,616	544,660,981	577,752,750	106.08%
2013	16,082,961	10,093,363	0	61,035,244	29,320,590	602,551,959	611,988,885	101.57%
2014	17,045,429	10,519,020	0	93,940,703	31,068,263	692,988,848	659,147,642	95.12%
2015	18,458,585	11,328,165	2,079,611	12,811,880	32,617,937	700,889,930	704,758,092	100.55%
2016	20,506,786	12,918,809	2,303,583	1,726,183	34,668,642	699,069,483	737,505,710	105.50%
2017	21,009,400	13,299,670	2,441,608	85,772,872	37,634,981	779,074,836	783,847,755	100.61%
2018	21,014,523	13,405,766	2,224,214	61,159,489	40,946,752	831,483,648	835,211,129	100.45%
2019	26,078,469	15,085,120	2,736,486	50,186,720	44,082,381	876,015,092	869,620,635	99.27%

Note: Results may be slightly off due to rounding.

(1) Net of investment fees and administrative expenses prior to 2015. Starting in 2015, administrative expenses are included in a separate column.

(2) Includes miscellaneous ICERS adjustment of $(10,719).

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 Legacy Regular Plus General Tier 3						
June 30, 2012	Restart Amortization	$40,847	19	$37,372	12	$3,896
June 30, 2013	Actuarial Loss	5,116	15	4,216	9	557
June 30, 2014	Actuarial Gain	(7,650)	15	(6,624)	10	(801)
June 30, 2014	Assumption Changes	10,549	20	10,251	15	898
June 30, 2015	Actuarial Gain	(2,641)	15	(2,385)	11	(267)
June 30, 2016	Actuarial Loss	743	15	693	12	72
June 30, 2017	Actuarial Loss	635	15	609	13	60
June 30, 2017	Assumption Changes	36,622	20	36,441	18	2,791
June 30, 2018	Actuarial Gain	(9,142)	15	(8,976)	14	(829)
June 30, 2019	Actuarial Loss	15,470	15	15,470	15	1,355
Subtotal				**$87,067**		**$7,732**

Note: Results may be slightly off due to rounding.

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)
General Legacy Supplemental						
June 30, 2012	Restart Amortization	$4,449	19	$4,071	12	$424
June 30, 2013	Actuarial Gain	(213)	15	(176)	9	(23)
June 30, 2014	Actuarial Gain	(687)	15	(595)	10	(72)
June 30, 2014	Assumption Changes	1,702	20	1,654	15	145
June 30, 2015	Actuarial Gain	(412)	15	(372)	11	(42)
June 30, 2016	Actuarial Gain	(191)	15	(179)	12	(19)
June 30, 2017	Actuarial Gain	(335)	15	(321)	13	(31)
June 30, 2017	Assumption Changes	1,264	20	1,258	18	96
June 30, 2018	Actuarial Gain	(229)	15	(225)	14	(21)
June 30, 2019	Actuarial Loss	1,554	15	1,554	15	136
Subtotal				**$6,669**		**$593**

Note: Results may be slightly off due to rounding.

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 Legacy Regular Plus Safety Tier 3						
June 30, 2012	Restart Amortization	$11,321	19	$10,358	12	$1,080
June 30, 2013	Actuarial Loss	815	15	672	9	89
June 30, 2014	Actuarial Gain	(3,097)	15	(2,682)	10	(324)
June 30, 2014	Assumption Changes	6,871	20	6,677	15	585
June 30, 2015	Actuarial Gain	(654)	15	(591)	11	(66)
June 30, 2016	Actuarial Loss	800	15	747	12	78
June 30, 2017	Actuarial Loss	1,773	15	1,701	13	166
June 30, 2017	Assumption Changes	7,653	20	7,615	18	583
June 30, 2018	Actuarial Gain	(5,148)	15	(5,055)	14	(467)
June 30, 2019	Actuarial Loss	2,488	15	2,488	15	218
Subtotal				**$21,930**		**$1,942**

Note: Results may be slightly off due to rounding.

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 Legacy Supplemental						
June 30, 2012	Restart Amortization	$8,952	19	$8,191	12	$854
June 30, 2013	Actuarial Loss	965	15	795	9	105
June 30, 2014	Actuarial Gain	(210)	15	(183)	10	(22)
June 30, 2014	Assumption Changes	2,526	20	2,454	15	215
June 30, 2015	Actuarial Loss	129	15	116	11	13
June 30, 2016	Actuarial Loss	160	15	149	12	16
June 30, 2017	Actuarial Gain	(268)	15	(257)	13	(25)
June 30, 2017	Assumption Changes	1,168	20	1,163	18	89
June 30, 2018	Actuarial Gain	(206)	15	(202)	14	(19)
June 30, 2019	Actuarial Loss	1,178	15	1,178	15	103
Subtotal				**$13,404**		**$1,329**

Note: Results may be slightly off due to rounding.

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, 2012	Restart Amortization	$65,569	19	$59,992	12	$6,253
June 30, 2013	Actuarial Loss	6,683	15	5,507	9	728
June 30, 2014	Actuarial Gain	(11,644)	15	(10,084)	10	(1,220)
June 30, 2014	Assumption Changes	21,648	20	21,036	15	1,843
June 30, 2015	Actuarial Gain	(3,578)	15	(3,232)	11	(361)
June 30, 2016	Actuarial Loss	1,512	15	1,410	12	147
June 30, 2017	Actuarial Loss	1,805	15	1,732	13	169
June 30, 2017	Assumption Changes	46,707	20	46,477	18	3,560
June 30, 2018	Actuarial Gain	(14,725)	15	(14,458)	14	(1,335)
June 30, 2019	Actuarial Loss	20,690	15	20,690	15	1,812
Grand Total				**$129,070**		**$11,596**

Note: Results may be slightly off due to rounding.

EXHIBIT I – PROJECTION OF UAAL BALANCES AND PAYMENTS

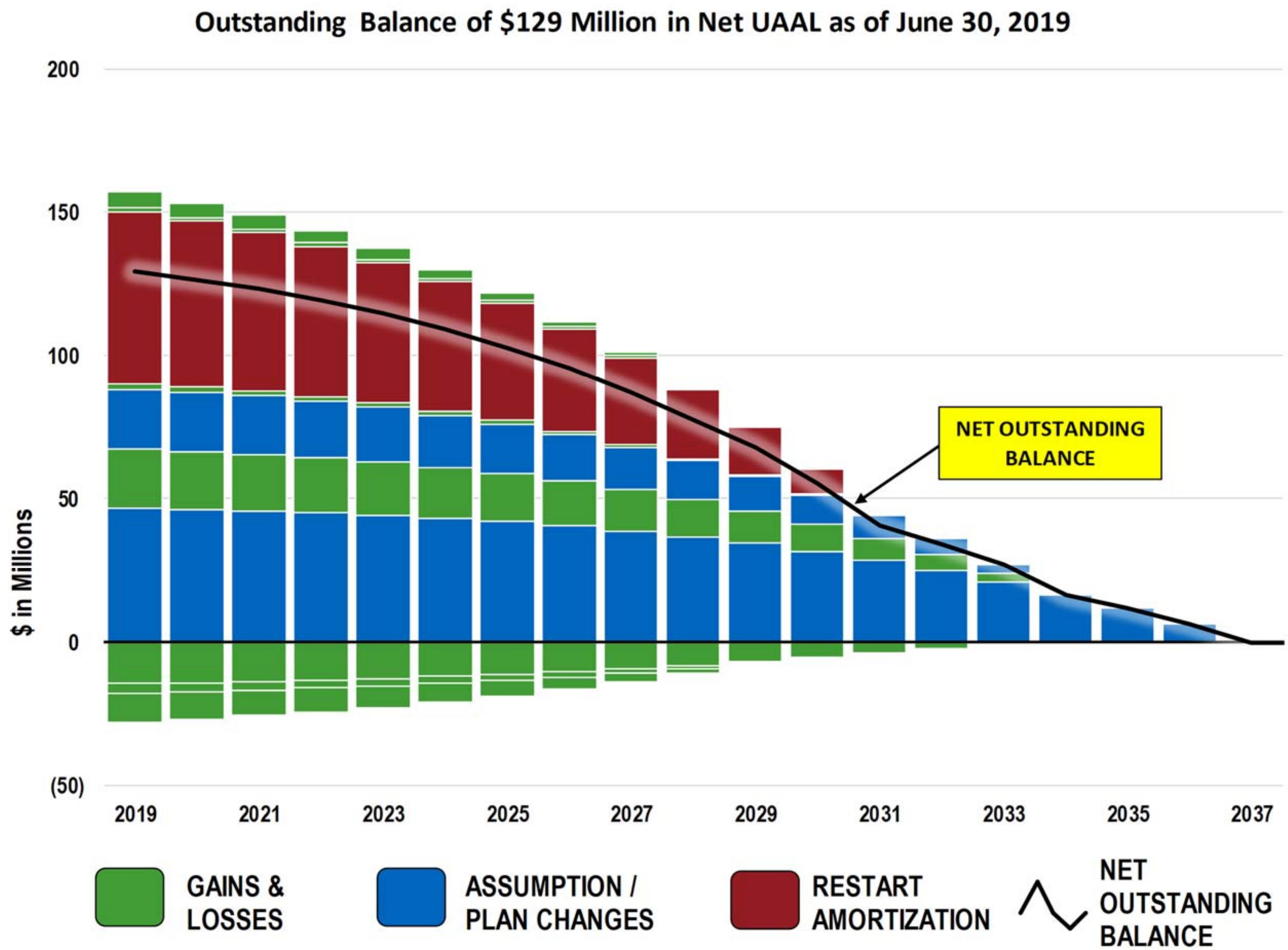


EXHIBIT I – PROJECTION OF UAAL BALANCES AND PAYMENTS (CONTINUED)

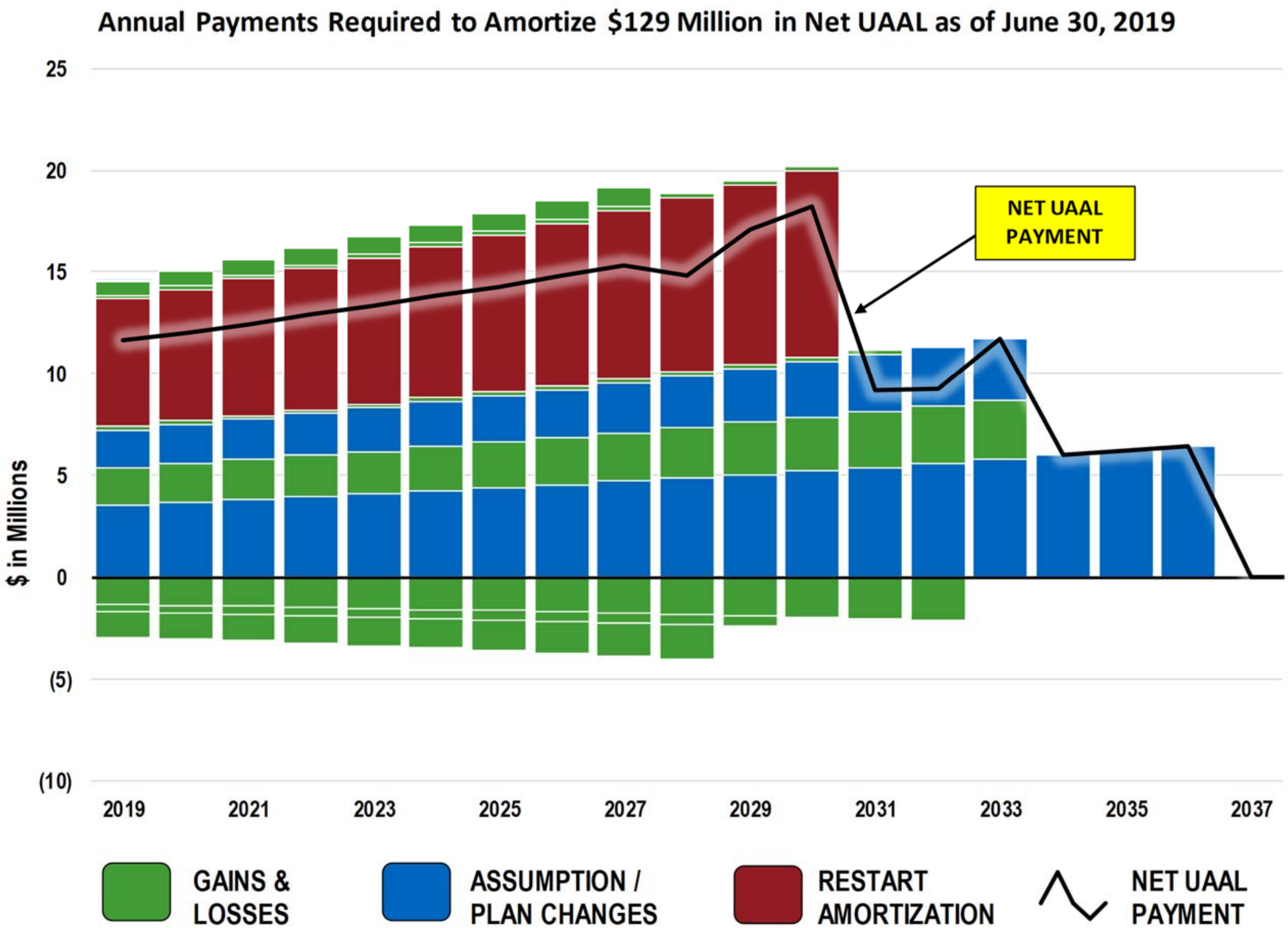


EXHIBIT J – DEFINITION OF PENSION TERMS

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, 2013 through June 30, 2016 Actuarial Experience Study report dated April 27, 2017. Unless otherwise noted, all actuarial assumptions and methods shown below apply to all tiers. These assumptions were adopted by the Board.

Economic Assumptions

Net Investment Return:

7.25%; net of investment expenses.

Based on the Actuarial Experience Study reference above, expected investment expenses represent about 0.40% of the Actuarial Value of Assets.

Administrative Expenses:

1.80% of payroll allocated to both the employer and member based on the components of the total average contribution rate (before expenses) for the employer and member. This results in an administrative expense load as shown below:

Average Contribution Rate Before Administrative Expense		Weighting	Total Loading
Employer	21.35%	65.13%	1.17%
Member	11.43%	34.87%	0.63%
Total		100.00%	1.80%

Under this approach, the employer Normal Cost rate is then increased by the same percent of payroll as the member rate with the remaining employer loading allocated to the employer UAAL rate. This is done to maintain a 50/50 sharing of Normal Cost for those in Tier 3. The table below shows this allocation.

Allocation of Administrative Expense Load as a % of Payroll	
Addition to Employer Regular Basic Normal Cost Rate	0.63%
Addition to Employer Regular Basic UAAL Rate	0.54%
Addition to Member Regular Basic Rate	0.63%
Total Addition to Contribution Rates	1.80%

The administrative expense load is added to the Regular Basic rates for employers and members.

Member Contribution Crediting Rate:

3.00%

Consumer Price Index:	Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 2.00% maximum change per year for all General and Safety.
Payroll Growth:	Inflation of 3.00% per year plus real "across the board" salary increases of 0.50% per year.
Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 3.00% per year from the valuation date.
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	4.75	8.00
1 – 2	4.50	6.25
2 – 3	4.25	5.50
3 – 4	4.00	5.50
4 – 5	3.50	4.00
5 – 6	3.25	3.50
6 – 7	3.00	3.25
7 – 8	2.75	3.25
8 – 9	2.75	3.25
9 – 10	2.75	3.25
10 – 11	2.50	2.50
11 – 12	2.25	2.00
12 – 13	2.00	1.50
13 – 14	1.75	1.50
14 – 15	1.50	1.50
15 & Over	1.25	1.25

Demographic Assumptions	
Post-Retirement Mortality Rates:	*Healthy* • **General and Safety Members and Beneficiaries:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Tables, projected 20 years with the two-dimensional MP-2016 projection scale, set forward one year. *Disabled* • **General and Safety Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Tables, projected 20 years with the two-dimensional MP-2016 projection scale, set forward seven years for males and set forward five years for females. The above mortality tables contain about a 20% margin, based on actual to expected deaths, to reflect future mortality improvement, based on a review of mortality experience as of the measurement date.
Pre-Retirement Mortality Rates:	• **General and Safety Members:** Headcount-Weighted RP-2014 Employee Mortality Tables projected 20 years with the two-dimensional MP-2016 projection scale.

	Rate (%)			
	General		Safety	
Age	Male	Female	Male	Female
20	0.04	0.02	0.04	0.02
25	0.05	0.02	0.05	0.02
30	0.05	0.02	0.05	0.02
35	0.06	0.03	0.06	0.03
40	0.07	0.04	0.07	0.04
45	0.10	0.07	0.10	0.07
50	0.17	0.12	0.17	0.12
55	0.28	0.18	0.28	0.18
60	0.47	0.26	0.47	0.26
65	0.83	0.38	0.83	0.38

For General members, all pre-retirement deaths are assumed to be non-service connected.

For Safety members, 50% of pre-retirement deaths are assumed to be non-service connected and the other 50% are assumed to be service connected.

Mortality Rates for Member Contributions:

- **General Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Tables, projected 20 years with the two-dimensional MP-2016 projection scale, set forward one year, weighted 30% male and 70% female.
- **Safety Members:** Headcount-Weighted RP-2014 Healthy Annuitant Mortality Tables, projected 20 years with the two-dimensional MP-2016 projection scale, set forward one year, weighted 80% male and 20% female.

Disability Incidence Rates:

	Disability Incidence Rate (%)		
	General		Safety
Age	Male	Female	Male and Female
20	0.000	0.000	0.020
25	0.006	0.006	0.038
30	0.010	0.022	0.230
35	0.016	0.054	0.500
40	0.050	0.088	0.780
45	0.088	0.130	1.110
50	0.142	0.180	2.000
55	0.236	0.260	2.500
60	0.310	0.420	2.500
65	0.132	0.200	1.000

60% of General disabilities are assumed to be service connected disabilities. The other 40% are assumed to be non-service connected disabilities.

100% of Safety disabilities are assumed to be service connected disabilities.

Termination Rates:

Termination (< 5 Years of Service)		
Years of Service	Rate (%)	
	General	Safety
Less than 1	18.50	10.00
1 – 2	9.00	9.00
2 – 3	7.50	8.00
3 – 4	6.50	6.00
4 – 5	6.50	6.00

Termination (5+ Years of Service)		
Age	Rate (%)	
	General	Safety
20	6.00	5.50
25	6.00	5.20
30	5.40	4.10
35	4.40	3.05
40	3.70	2.30
45	3.20	1.70
50	3.00	0.60
55	3.00	0.00
60	2.40	0.00

Proportion of Total Terminations Assumed to Receive Refunds and Deferred Vested Benefits		
Years of Service	Rate (%)	
	Refunds	Deferred Vested Benefits
0 – 4	100.00	0.00
5 – 9	45.00	55.00
10 – 14	40.00	60.00
15 – 19	30.00	70.00
20 & Over	0.00	100.00

No termination is assumed after a member is eligible for retirement (as long as a retirement rate is present).

Retirement Rates:

Age	Retirement Rates[1] (%) General Legacy	General Tier 3	Safety Legacy	Safety Tier 3
48	0.00	0.00	0.00	0.00
49	0.00	0.00	3.00	0.00
50	2.00	0.00	9.00	8.00
51	2.00	0.00	18.00	7.00
52	3.00	3.00	18.00	11.00
53	3.00	2.00	15.00	12.00
54	5.00	3.00	15.00	12.00
55	6.00	4.00	17.00	14.00
56	7.00	5.50	17.00	14.00
57	9.00	7.50	25.00	14.00
58	11.00	7.50	25.00	10.00
59	13.00	9.50	25.00	10.00
60	15.00	11.00	40.00	40.00
61	17.00	11.00	40.00	40.00
62	20.00	15.00	40.00	40.00
63	25.00	20.00	40.00	40.00
64	30.00	21.00	40.00	40.00
65	30.00	26.00	50.00	50.00
66	30.00	28.00	50.00	50.00
67	30.00	30.00	50.00	50.00
68	40.00	40.00	50.00	50.00
69	40.00	40.00	50.00	50.00
70	40.00	40.00	100.00	100.00
71	40.00	40.00	100.00	100.00
72	40.00	40.00	100.00	100.00
73	40.00	40.00	100.00	100.00
74	40.00	40.00	100.00	100.00
75 & Over	100.00	100.00	100.00	100.00

[1] The retirement rates only apply to members that are eligible to retire at the age shown.

Retirement Age and Benefit for Deferred Vested Members:	For current and future deferred vested members, retirement assumptions are as follows: General Retirement Age: 58 Safety Retirement Age: 54 Current deferred vested non-reciprocal members who terminate with less than five years of service are assumed to retire at age 70 for General and at age 60 for Safety if they decide to leave their contributions on deposit. 65% of future General and 75% of future Safety deferred vested members are assumed to continue to work for a reciprocal employer. For reciprocals, projected salary is calculated based on the salary increase assumption.
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 male.
Inclusion of Deferred Vested Members:	All deferred vested members are included in the valuation.
Definition of Active Members:	All active members of ICERS as of the valuation date.
Form of Payment:	All active and inactive members are assumed to elect the unmodified option at retirement.
Percent Married:	For all active and inactive members, 80% of male members and 60% 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.
Terminal Pay Assumptions:	The following assumptions for terminal pay due to conversion of unused vacation and holiday compensation time as a percentage of final average pay are used: General Legacy: 5.00% Safety Legacy: 6.00% Tier 3: None
Sick Leave Conversion:	Conversion of 22 hours for General (36 hours for Safety) for each year of service.

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, as if the current benefit formula for each individual has always been in effect (i.e., “replacement life within a tier”).
Actuarial Value of Assets:	Market value of assets (MVA) less unrecognized returns in each of the last nine semi-annual interest crediting periods. Unrecognized returns are equal to the difference between the actual market return and the expected return on the market value, and are recognized semi-annually over a five-year period. The actuarial value of assets (AVA) is limited by a 30% corridor; the AVA cannot be less than 70% of MVA, nor greater than 130% of MVA.
Valuation Value of Assets:	The Actuarial Value of Assets reduced by the value of the non-valuation reserves.
Amortization Policy:	The Unfunded Actuarial Accrued Liability associated with the Regular Legacy Benefit as of June 30, 2012 is amortized over a declining 19-year period (with 12 years remaining as of June 30, 2019). The Unfunded Actuarial Accrued Liability associated with the Supplemental UAAL relief for Safety members is amortized over a declining 19-year period (with 12 years remaining as of June 30, 2019). Any new UAAL emerging after June 30, 2012 that arises due to actuarial gains or losses will be amortized over a 15-year closed period. Any change in UAAL as a result of a change in actuarial assumptions or methods will be amortized over a 20-year closed period. Any change in UAAL that arises due to plan amendments will be amortized over a 15-year closed period and any change in UAAL due to temporary retirement incentive programs will be amortized over a 5-year closed period. If ICERS becomes overfunded, such surplus and any subsequent surpluses will be amortized over an open amortization period of 30 years.

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 expressed as a level percentage of the member's compensation. *Contribution to the Unfunded Actuarial Accrued Liability (UAAL)* The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution (or rate credit in the case of a negative UAAL) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the System) assuming a constant number of active members. In order to remain as a level percentage of payroll, amortization payments (credits) are scheduled to increase at the annual rate of 3.50% (i.e., 3.00% 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 D.*
Member Contributions:	**General Legacy and Safety Legacy Members** Articles 6 and 6.8 of the 1937 Act define the methodology to be used in the calculation of member basic contribution rates for General Legacy members and Safety Legacy members, respectively. The basic contribution rate for the Regular benefit 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 1/120 of Final Average Salary for General and 1/100 of Final Average Salary for Safety. That age is 55 for all General and 50 for all Safety. It is assumed that contributions are made annually at the same rate, starting at entry age. In addition to their basic contributions for the Regular benefit, members pay one-half of the total normal cost necessary to fund their cost-of-living Regular benefit. Accumulation includes semi-annual crediting of interest at the assumed investment earning rate. Members pay the additional Normal Cost attributable to the difference between the Total (i.e., Regular plus Supplemental) and Regular benefits. In addition, members also pay for the cost of any unfunded actuarial accrued liability attributable to the difference between the Total and the Regular benefits.

Member Contributions (continued):	**General Tier 3 and Safety Tier 3 Members** Pursuant to Section 7522.30(a) of the Government Code, General Tier 3 and Safety Tier 3 members are required to contribute at least 50% of the Normal Cost rate. In addition, there are certain additional requirements that would have to be met such as requiring the new employees to pay the contribution rate of "similarly situated employees", if it is greater (reference: Section 7522.30(c)). We further understand that different rules may have to be applied for collectively bargained employees, non-represented, managerial or other supervisory employees (reference: Section 7522.30(e)). In preparing the Normal Cost rates in this report, we have assumed that exactly 50% of the Normal Cost would be paid by the new members and we have taken into account in this valuation only the requirements of Section 7522.30(c), but not requirements of Section 7522.30(e). Members also pay for the cost of any unfunded actuarial accrued liability (UAAL) for General Legacy and Safety Legacy Tiers attributable to the difference between the Total (i.e., Regular plus Supplemental) and the Regular benefits. The results of this valuation reflect an agreement in effect for certain County bargaining units for the employer to pick up the Supplemental UAAL contributions for the Tier 3 members. According to a list provided by ICERS on August 15, 2019, all bargaining units covering General Tier 3 members except for the Professional Legal Bargaining Unit have reached this agreement, and all bargaining units covering Safety Tier 3 members have reached this agreement. Members who are not a part of the bargaining units that have reached this agreement (referenced in this valuation report as "Member Pays Supplemental UAAL") have a separate set of Tier 3 employer and member contribution rates that differ from the Tier 3 employer and member contribution rates for members belonging to the bargaining units that have reached this agreement (referenced in this valuation report as "Employer Picks Up Supplemental UAAL"). 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. For members in the Legacy Tiers, benefits in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m). Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard. Contribution rates determined in this valuation have not been reduced for the Section 415 limitations. Actual limitations will result in gains as they occur.
Changed Actuarial Assumptions:	There have been no changes in actuarial assumptions since the last valuation.

EXHIBIT II – SUMMARY OF PLAN PROVISIONS

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

Plan Year:	July 1 through June 30
Membership Eligibility:	Membership with ICERS usually begins with the first day of the pay period following the date of appointment to a full-time position of at least 30 hours per week.
General	All General members terminated before July 1, 2005 will receive the General Regular Benefit. All General members terminated on or after July 1, 2005 with membership dates prior to January 1, 2013 will receive the Regular plus Supplemental Benefit. All other General members will receive the CalPEPRA Benefit (Tier 3).
Safety	All Safety members with membership dates prior to January 1, 2013 will receive the Regular plus Supplemental Benefit. All other Safety members will receive the CalPEPRA Benefit (Tier 3).
Final Compensation for Benefit Determination:	
General Legacy and Safety Legacy	Highest consecutive 12 months of compensation earnable (§31462.1) (FAS1).
Tier 3	Highest consecutive 36 months of pensionable compensation (§7522.32) (FAS3).
Service:	Years of service (Yrs).
Service Retirement Eligibility:	
General Legacy	Age 50 with 10 years of service, or age 70 regardless of service, or after 30 years regardless of age (§31672).
General Tier 3	Age 52 with 5 years of service (§7522.20(a)), or age 70 regardless of service (§31672.3).
Safety Legacy	Age 50 with 10 years of service, or age 60 regardless of service, or after 20 years regardless of age (§31663.25).
Safety Tier 3	Age 50 with 5 years of service (§7522.25(d)), or age 70 regardless of service (§31672.3).

Benefit Formula:

Plan	Retirement Age	Benefit Formula
General Regular (§31676.11)	**Retirement Age**	**Benefit Formula**
	50	1.24% x FAS1 x Yrs
	55	1.67% x FAS1 x Yrs
	60	2.18% x FAS1 x Yrs
	65 & Over	2.61% x FAS1 x Yrs
General Regular Plus Supplemental (§31676.14)	**Retirement Age**	**Benefit Formula**
	50	1.48% x FAS1 x Yrs
	55	1.95% x FAS1 x Yrs
	60	2.44% x FAS1 x Yrs
	65 & Over	2.61% x FAS1 x Yrs
General Tier 3 (§7522.20(a))	**Retirement Age**	**Benefit Formula**
	52	1.00% x FAS3 x Yrs
	55	1.30% x FAS3 x Yrs
	60	1.80% x FAS3 x Yrs
	62	2.00% x FAS3 x Yrs
	65	2.30% x FAS3 x Yrs
	67 & Over	2.50% x FAS3 x Yrs
Safety Regular (§31664)	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAS1 x Yrs
	55 & Over	2.62% x FAS1 x Yrs
Safety Regular Plus Supplemental (§31664.1)	**Retirement Age**	**Benefit Formula**
	50 & Over	3.00% x FAS1 x Yrs
Safety Tier 3 (§7522.25(d))	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAS3 x Yrs
	55	2.50% x FAS3 x Yrs
	57 & Over	2.70% x FAS3 x Yrs

Maximum Benefit:	
General Legacy and Safety Legacy	100% of Highest Average Compensation (§31676.11, §31676.14, §31664, and §31664.1).
Tier 3	There is no final compensation limit on the maximum retirement benefit.
Non-Service Connected Disability:	
All Members	
Eligibility	Five years of service (§31720).
Benefit	20% of Final Compensation for the first five years of service plus 2% for each year of additional service for a maximum of 40% of Final Compensation (§31727.7). The service retirement benefit is 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	No age or service requirements.
Basic lump sum benefit	Refund of employee contributions with interest, plus one month's compensation for each year of service, to a maximum of six months' compensation (§31781).
Death in line of duty	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).
Vested Members	
Eligibility	Five years of service.
Basic benefit	60% of the greater of Service Retirement or Ordinary Disability Retirement benefit payable to surviving eligible spouse (§31765.1, §31781.1), in lieu of the basic lump sum benefit above.
Death in line of duty	50% of Final compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).

Safety Members	
Eligibility	No age or service requirements.
Violent Death	Lump sum of twelve months' compensation.
Death After Retirement:	
All Members	
Service Retirement or Non-Service Connected Disability Retirement	60% of member's unmodified allowance continued to eligible spouse (§31760.1) and $5,000 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 date of retirement (§31760.1) or at least two years prior to the date of death and has attained age 55 on or prior to the date of death (§31786.1).
Line-of-Duty Disability	100% of member's 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). Effective January 1, 2003, a member may also elect to leave contributions on deposit in the retirement fund (§31629.5).
Five or More Years of Service	If contributions left on deposit, a member is entitled to earned benefits commencing at any time after eligible to retire (§31700).
Post-Retirement Cost-of-Living Benefits:	
General and Safety	Future changes based on Consumer Price Index to a maximum of 2% per year; excess "banked" (§31870).
Compensation Earnable:	
General and Safety Legacy	Includes base pay plus uniform allowance, shift differential, on-call pay, bilingual pay, training officer stipend, bomb stipend, EMT/paramedic stipend, firefighters in lieu of holiday pay, resident duty pay, educational allowance, annual vacation buyback (dept. heads only), staff stipend, in lieu of mileage, and sick leave buyback. Certain vacation, holiday compensation time, and administrative leave which are earned but not used may also be added to compensation earnable.
Pensionable Compensation:	
General and Safety Tier 3	Includes base pay plus shift differential, on-call pay, bilingual pay, training officer stipend, bomb stipend, EMT/paramedic stipend, firefighters in lieu of holiday pay, hazardous stipend, educational allowance, and staff stipend.

Member Contributions:	Please refer to *Section 4, Exhibit III* for specific rates.
General Legacy	
Basic Regular	Entry age based rates that provide for an annuity at age 60 equal to 1/100 of FAS1 (§31621.2).
Cost-of-Living Regular	Entry age based rates that provide for one-half of future Cost-of-Living costs.
Supplemental	Members pay the additional Normal Cost attributable to the difference between the Total (i.e., Regular and Supplemental benefits) and Regular benefits. In addition, members also pay for the cost of any unfunded actuarial accrued liability attributable to the difference between the Total and the Regular benefits.
Employer Pickup	3% of pay.
General Tier 3	Non-entry age based rates that provide for 50% of total Normal Cost Rate.
Supplemental UAAL	Members also pay, as the same level percentage salary as all other General members, the cost of any unfunded actuarial accrued liability attributable to the difference between the Total and the Regular benefits for General Legacy members.
Employer Pickup	Certain General County bargaining units have reached an agreement for the employer to pick up the Supplemental UAAL contributions for the Tier 3 members. Details are provided in *Section 4, Exhibit I.*
Safety Legacy	
Basic Regular	Entry age based rates that provide for an annuity at age 50 equal to 1/100 of FAS1 (§31639.25).
Cost-of-Living Regular	Entry age based rates that provide for one-half of future Cost-of-Living costs.
Supplemental	Members pay the additional Normal Cost attributable to the difference between the Total (i.e., Regular and Supplemental benefits) and Regular benefits. In addition, members also pay for the cost of any unfunded actuarial accrued liability attributable to the difference between the Total and the Regular benefits.
Employer Pickup	3% of pay.
Safety Tier 3	Non-entry age based rates that provide for 50% of total Normal Cost Rate.
Supplemental UAAL	Members also pay, as the same level percentage salary as all other Safety members, the cost of any unfunded actuarial accrued liability attributable to the difference between the Total and the Regular benefits for Safety Legacy members.
Employer Pickup	All Safety County bargaining units have reached an agreement for the employer to pick up the Supplemental UAAL contributions for the Tier 3 members. Details are provided in *Section 4, Exhibit I.*
Other Information:	Safety Legacy members with 30 or more years of service are exempt from paying member contributions. The same applies for General Legacy members hired on or before March 7, 1973.

Changed Plan Provisions:	There have been no changes in plan provisions since the last valuation.

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

EXHIBIT III – MEMBER CONTRIBUTION RATES

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

General Legacy				Safety Legacy			
Entry Age	Current	New	Change	Entry Age	Current	New	Change
25	9.68%	9.76%	**0.08%**	25	22.22%	22.79%	**0.57%**
35	11.18%	11.26%	**0.08%**	35	24.56%	25.13%	**0.57%**
45	12.69%	12.77%	**0.08%**	45	26.00%	26.58%	**0.58%**

General Tier 3 (Member Pays Supplemental UAAL)				Safety Tier 3 (Member Pays Supplemental UAAL)			
Entry Age	Current	New	Change	Entry Age	Current	New	Change
Any	9.85%	9.82%	**(0.03%)**	Any	19.02%	19.69%	**0.67%**

General Tier 3 (Employer Picks Up Supplemental UAAL)				Safety Tier 3 (Employer Picks Up Supplemental UAAL)			
Entry Age	Current	New	Change	Entry Age	Current	New	Change
Any	9.34%	9.20%	**(0.14%)**	Any	14.40%	14.48%	**0.08%**

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

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

General Legacy					
Entry Age	Basic	COLA	Supplemental(1)	Pickup	Total
15	7.14%	1.62%	2.88%	(3.00%)	8.64%
16	7.14%	1.62%	2.88%	(3.00%)	8.64%
17	7.24%	1.64%	2.88%	(3.00%)	8.76%
18	7.33%	1.66%	2.88%	(3.00%)	8.87%
19	7.43%	1.69%	2.88%	(3.00%)	9.00%
20	7.53%	1.71%	2.88%	(3.00%)	9.12%
21	7.63%	1.74%	2.88%	(3.00%)	9.25%
22	7.73%	1.76%	2.88%	(3.00%)	9.37%
23	7.83%	1.79%	2.88%	(3.00%)	9.50%
24	7.94%	1.82%	2.88%	(3.00%)	9.64%
25	8.04%	1.84%	2.88%	(3.00%)	9.76%
26	8.15%	1.87%	2.88%	(3.00%)	9.90%
27	8.26%	1.90%	2.88%	(3.00%)	10.04%
28	8.37%	1.92%	2.88%	(3.00%)	10.17%
29	8.49%	1.95%	2.88%	(3.00%)	10.32%
30	8.61%	1.98%	2.88%	(3.00%)	10.47%
31	8.73%	2.01%	2.88%	(3.00%)	10.62%
32	8.85%	2.04%	2.88%	(3.00%)	10.77%
33	8.98%	2.07%	2.88%	(3.00%)	10.93%
34	9.11%	2.11%	2.88%	(3.00%)	11.10%
35	9.24%	2.14%	2.88%	(3.00%)	11.26%
36	9.38%	2.17%	2.88%	(3.00%)	11.43%
37	9.52%	2.21%	2.88%	(3.00%)	11.61%
38	9.67%	2.25%	2.88%	(3.00%)	11.80%
39	9.83%	2.29%	2.88%	(3.00%)	12.00%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Legacy (continued)					
Entry Age	Basic	COLA	Supplemental[1]	Pickup	Total
40	9.97%	2.32%	2.88%	(3.00%)	12.17%
41	10.10%	2.35%	2.88%	(3.00%)	12.33%
42	10.21%	2.38%	2.88%	(3.00%)	12.47%
43	10.31%	2.41%	2.88%	(3.00%)	12.60%
44	10.39%	2.43%	2.88%	(3.00%)	12.70%
45	10.45%	2.44%	2.88%	(3.00%)	12.77%
46	10.51%	2.45%	2.88%	(3.00%)	12.84%
47	10.58%	2.47%	2.88%	(3.00%)	12.93%
48	10.63%	2.48%	2.88%	(3.00%)	12.99%
49	10.67%	2.49%	2.88%	(3.00%)	13.04%
50	10.69%	2.50%	2.88%	(3.00%)	13.07%
51	10.66%	2.49%	2.88%	(3.00%)	13.03%
52	10.61%	2.48%	2.88%	(3.00%)	12.97%
53	10.50%	2.45%	2.88%	(3.00%)	12.83%
54 & Over	10.22%	2.38%	2.88%	(3.00%)	12.48%

Interest:	7.25% per annum
COLA:	2.00%
Administrative Expenses:	0.63% of payroll added to Basic rates
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	24.85% for Regular benefits, applied to Basic rates prior to adjustment for administrative expenses
Non-Refundability Factor:	90.68%
Terminal Pay:	5.00%

[1] The breakdown of the Supplemental Benefit into Normal Cost and UAAL rates is as follows:

Normal Cost:	2.26%
UAAL:	0.62%
Total:	2.88%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 3 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)[1]

General Tier 3 (Member Pays Supplemental UAAL)				
Entry Age	Basic	COLA	Legacy Supplemental UAAL	Total
All Ages	7.68%	1.52%	0.62%	9.82%

General Tier 3 (Employer Picks Up Supplemental UAAL)				
Entry Age	Basic	COLA	Legacy Supplemental UAAL	Total
All Ages	7.68%	1.52%	0.00%	9.20%

The General Tier 3 member contribution rate is 50% of the Total Normal Cost (Basic + COLA) plus, as the same level percentage salary as all other General members, the cost of any unfunded actuarial accrued liability attributable to the difference between the Total and the Regular benefits for General Legacy members. The Basic rate shown above also includes an administrative expense load of 0.63% of payroll.

(1) It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the maximum compensation that can be taken into account for 2019 is equal to $149,016 (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019 (reference: Section 7522.10(d)).

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

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

Safety Legacy					
Entry Age	Basic	COLA	Supplemental[1]	Pickup	Total
15	9.39%	2.87%	11.88%	(3.00%)	21.14%
16	9.39%	2.87%	11.88%	(3.00%)	21.14%
17	9.52%	2.92%	11.88%	(3.00%)	21.32%
18	9.65%	2.96%	11.88%	(3.00%)	21.49%
19	9.78%	3.00%	11.88%	(3.00%)	21.66%
20	9.91%	3.04%	11.88%	(3.00%)	21.83%
21	10.05%	3.09%	11.88%	(3.00%)	22.02%
22	10.19%	3.14%	11.88%	(3.00%)	22.21%
23	10.33%	3.18%	11.88%	(3.00%)	22.39%
24	10.48%	3.23%	11.88%	(3.00%)	22.59%
25	10.63%	3.28%	11.88%	(3.00%)	22.79%
26	10.78%	3.33%	11.88%	(3.00%)	22.99%
27	10.94%	3.38%	11.88%	(3.00%)	23.20%
28	11.10%	3.43%	11.88%	(3.00%)	23.41%
29	11.27%	3.49%	11.88%	(3.00%)	23.64%
30	11.44%	3.55%	11.88%	(3.00%)	23.87%
31	11.62%	3.61%	11.88%	(3.00%)	24.11%
32	11.81%	3.67%	11.88%	(3.00%)	24.36%
33	12.00%	3.73%	11.88%	(3.00%)	24.61%
34	12.20%	3.80%	11.88%	(3.00%)	24.88%
35	12.39%	3.86%	11.88%	(3.00%)	25.13%
36	12.59%	3.92%	11.88%	(3.00%)	25.39%
37	12.81%	4.00%	11.88%	(3.00%)	25.69%
38	12.98%	4.05%	11.88%	(3.00%)	25.91%
39	13.11%	4.09%	11.88%	(3.00%)	26.08%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Legacy (continued)					
Entry Age	Basic	COLA	Supplemental[1]	Pickup	Total
40	13.17%	4.11%	11.88%	(3.00%)	26.16%
41	13.23%	4.13%	11.88%	(3.00%)	26.24%
42	13.30%	4.16%	11.88%	(3.00%)	26.34%
43	13.38%	4.18%	11.88%	(3.00%)	26.44%
44	13.45%	4.21%	11.88%	(3.00%)	26.54%
45	13.48%	4.22%	11.88%	(3.00%)	26.58%
46	13.36%	4.18%	11.88%	(3.00%)	26.42%
47	13.24%	4.14%	11.88%	(3.00%)	26.26%
48	13.01%	4.06%	11.88%	(3.00%)	25.95%
49 & Over	12.43%	3.87%	11.88%	(3.00%)	25.18%

Interest:	7.25% per annum
COLA:	2.00%
Administrative Expenses:	0.63% of payroll added to Basic rates
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	32.81% for Regular benefits, applied to Basic rates prior to adjustment for administrative expenses
Non-Refundability Factor:	91.89%
Terminal Pay:	6.00%

[1] The breakdown of the Supplemental Benefit into Normal Cost and UAAL rates is as follows:

Normal Cost:	6.67%
UAAL:	5.21%
Total:	11.88%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 3 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of monthly payroll)[1]

Safety Tier 3 (Member Pays Supplemental UAAL)				
Entry Age	Basic	COLA	Legacy Supplemental UAAL	Total
All Ages	11.68%	2.80%	5.21%	19.69%

Safety Tier 3 (Employer Picks Up Supplemental UAAL)				
Entry Age	Basic	COLA	Legacy Supplemental UAAL	Total
All Ages	11.68%	2.80%	0.00%	14.48%

The Safety Tier 3 member contribution rate is 50% of the Total Normal Cost (Basic + COLA) plus, as the same level percentage salary as all other Safety members, the cost of any unfunded actuarial accrued liability attributable to the difference between the Total and the Regular benefits for Safety Legacy members. The Basic rate shown above also includes an administrative expense load of 0.63% of payroll.

(1) It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the maximum compensation that can be taken into account for 2019 is equal to $149,016 (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019 (reference: Section 7522.10(d)).

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