Alameda County Employees' Retirement Association

BOARD OF RETIREMENT

AUDIT COMMITTEE/BOARD MEETING NOTICE and AGENDA

ACERA MISSION:

To provide ACERA members and employers with flexible, cost-effective, participant-oriented benefits through prudent investment management and superior member services.

Thursday, June 20, 2019
1:00 p.m.

LOCATION	COMMITTEE MEMBERS	
ACERA C.G. "BUD" QUIST BOARD ROOM 475 14TH STREET, 10TH FLOOR OAKLAND, CALIFORNIA 94612-1900 MAIN LINE: 510.628.3000 FAX: 510.268.9574	HENRY LEVY, CHAIR	EX-OFFICIO
	TARRELL GAMBLE, VICE-CHAIR	APPOINTED
	KEITH CARSON	APPOINTED
	DALE AMARAL	ELECTED SAFETY
	ELIZABETH ROGERS	ELECTED GENERAL

Should a quorum of the Board attend this meeting, this meeting shall be deemed a joint meeting of the Board and Committee.

The order of agenda items is subject to change without notice. Board and Committee agendas and minutes are available online at www.acera.org.

Note regarding public comments: Public comments are limited to four (4) minutes per person in total.

Note regarding accommodations: The Board of Retirement will provide reasonable accommodations for persons with special needs of accessibility who plan to attend Board meetings. Please contact ACERA at (510) 628-3000 to arrange for accommodation.

AUDIT COMMITTEE/BOARD MEETING

Call to Order: 1:00 p.m.

Public Comment:

Action Items: Matters for Discussion and Possible Motion by the Committee

External Audit:

1. **Discussion and possible motion to adopt the audited Schedules of Employer Allocations and Schedules of Pension Amounts by Employer with Related Notes, based on the Addendum to Governmental Accounting Standards Board (GASB) Statement No. 67 Valuation as of December 31, 2018**

   - Margo Allen
   - Audrey Elbert

   Recommendation:
   The Audit Committee recommends to the Board of Retirement that the Board adopt the audited Schedules of Employer Allocations and Schedules of Pension Amounts by Employer with Related Notes, based on the Addendum to GASB Statement No. 67 Valuation as of December 31, 2018.

2. **Discussion and possible motion to adopt the audited Schedules of Employer OPEB Allocations and Schedules of OPEB Amounts by Employer with Related Notes, based on the Addendum to GASB Statement No. 74 Valuation as of December 31, 2018**

   - Margo Allen
   - Audrey Elbert

   Recommendation:
   The Audit Committee recommends to the Board of Retirement that the Board adopt the audited Schedules of Employer OPEB Allocations and Schedules of OPEB Amounts by Employer with Related Notes, based on the Addendum to GASB Statement No. 74 Valuation as of December 31, 2018.

Information Items: These items are not presented for Committee action but consist of status updates and cyclical reports

External Audit

1. **Presentation and discussion of the GASB 68 Valuation and Employer Schedules as of December 31, 2018**

   - Margo Allen

2. **Presentation and discussion of the GASB 75 Valuation and Employer Schedules as of December 31, 2018**

   - Margo Allen

Internal Audit

3. Progress report on the Internal Audit Plan

- Harsh Jadhav

4. Review of completed audits

- Harsh Jadhav

Trustee Comment:

Future Discussion Items

External Audit

1. None

Internal Audit

1. Progress report on the Internal Audit Plan
2. Review complete audits

Establishment of Next Meeting Date

October 17, 2019, at 1:00 pm

ACERA

MEMORANDUM TO THE AUDIT COMMITTEE

DATE: June 20, 2019

TO: Members of the Audit Committee

FROM: Margo Allen, Fiscal Services Officer

SUBJECT: **Audited Schedule of Employer Allocations (Pension and OPEB) and Schedule of Pension Amounts by Employer and Schedule of OPEB Amounts by Employer Based on the Governmental Accounting Standards Board (GASB) Statement No. 67 and Statement No. 74, as of December 31, 2018**

Executive Summary

Attached for review and discussion are the 2018 audited schedules of employer allocations (pension and OPEB) and schedules of pension amounts by employer and schedules of OPEB amounts by employer.

During the June 20, 2019, Audit Committee meeting, Audrey Elbert, Williams Adley & Company-CA (WACO), will present and discuss the audit opinions of the set of schedules that ACERA staff prepared using Segal Consulting's Addenda to the GASB Statement No. 67 and GASB Statement No. 74 Actuarial Valuations as of December 31, 2018. These worksheets included the Schedule of Employer Allocations (Pension and OPEB) and the Schedule of Pension Amounts by Employer and the Schedule of OPEB Amounts by Employer, with related notes.

In combination with the GASB Statement No. 68 and GASB Statement No. 75 actuarial valuations, the audited allocation schedules contain all the required pension and OPEB liability reporting information employers need to complete their June 30, 2019, fiscal year-end reporting requirements. Once the Board has adopted the audited set of schedules, staff will distribute the audited schedules and the GASB Statement No. 68 and Statement No. 75 actuarial valuations to ACERA's participating employers.

Recommendations

1. Staff recommends that the Audit Committee recommend to the Board of Retirement that the Board adopt the audited Schedule of Employer Allocations and Schedule of Pension Amounts by Employer with Related Notes, based on the Addendum to GASB Statement No. 67 Valuation as of December 31, 2018.
2. Staff recommends that the Audit Committee recommend to the Board of Retirement that the Board adopt the audited Schedule of Employer Allocations and Schedule of OPEB Amounts by Employer with Related Notes, based on the Addendum to GASB Statement No. 74 Valuation as of December 31, 2018.

Alameda County Employees' Retirement Association (ACERA)

Schedule of Employer Allocations and Schedule of Pension Amounts by Employer

As of and for the Year Ended December 31, 2018

Alameda County Employees' Retirement Association (ACERA)

Schedule of Employer Allocations and Schedule of Pension Amounts by Employer

As of and for the Year Ended December 31, 2018

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Independent Auditor's Report

Board of Retirement
Alameda County Employees' Retirement Association
Oakland, California

We have audited the accompanying schedule of employer allocations of the Alameda County Employees' Retirement Association (ACERA), as of and for the year ended December 31, 2018, and the related notes. We have also audited the columns titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, and the total pension expense (specified column totals) included in the accompanying schedule of pension amounts by employer of ACERA as of and for the year ended December 31, 2018, and the related notes.

Management's Responsibility for the Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and net pension liability, total deferred outflows of resources, total deferred inflows of resources, and total pension expense for ACERA as of and for the year ended December 31, 2018, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of ACERA as of and for the year ended December 31, 2018, and our report thereon, dated June __, 2019, expressed an unmodified opinion on those financial statements.

Restriction on Use

Our report is intended solely for the information and use of ACERA management, the Board of Retirement, ACERA employers and their auditors, and is not intended to be and should not be used by anyone other than these specified parties.

Oakland, California
June __, 2019

Alameda County Employees' Retirement Association (ACERA)
Schedule of Employer Allocations as of and for the Year Ended December 31, 2018
Actual Employer Contributions by Employer and Membership Class and Net Pension Liability (NPL) Allocation

	Excluding ACOE and LARPD (Excluding non-OPEB SRBR NPL)			ACOE Members Only (Excluding non-OPEB SRBR NPL)			LARPD Members Only (Excluding non-OPEB SRBR NPL)			All General Members Combined (Excluding non-OPEB SRBR NPL)		
Employer	General Contributions	Contribution Percentage[1, 2]	General NPL	General Contributions	Contribution Percentage[2]	General NPL	General Contributions	Contribution Percentage[2]	General NPL	General Contributions	General NPL	General NPL Percentage
Alameda County	$ 112,075,994	64.134%	$ 1,056,842,788	$ -	N/A	$ -	$ -	0.000%	$ -	$ 112,075,994	$ 1,056,842,788	63.480%
Alameda Health System	50,652,924	28.985%	477,641,781	-	N/A	-	-	0.000%	-	50,652,924	477,641,781	28.690%
Superior Court	9,789,834	5.602%	92,315,179	-	N/A	-	-	0.000%	-	9,789,834	92,315,179	5.545%
First 5	1,022,889	0.585%	9,645,534	-	N/A	-	-	0.000%	-	1,022,889	9,645,534	0.579%
Housing Authority	1,213,308	0.694%	11,441,128	-	N/A	-	-	0.000%	-	1,213,308	11,441,128	0.687%
LARPD	-	0.000%	-	-	N/A	-	1,100,236	100.000%	15,284,738	1,100,236	15,284,738	0.918%
ACOE[2]	-	0.000%	-	-	N/A	1,666,157	-	0.000%	-	-	1,666,157	0.100%
Total for All Employers	**$ 174,754,949**	**100.000%**	**$ 1,647,886,410**	**$ -**	**N/A**	**$ 1,666,157**	**$ 1,100,236**	**100.000%**	**$ 15,284,738**	**$ 175,855,185**	**$ 1,664,837,305**	**100.000%**

	Safety Members (Excluding non-OPEB SRBR NPL)			General and Safety Total (Excluding non-OPEB SRBR NPL)				General and Safety Non-OPEB SRBR NPL		Total		
Employer	Safety Contributions	Contribution Percentage[2]	Safety NPL	Total Contributions	Contribution Percentage[1, 3]	NPL	NPL Percentage	Non-OPEB NPL	Contribution Percentage[4]	Total Contributions	Total NPL	Total NPL Percentage
Alameda County	$ 93,829,624	100.000%	$ 971,674,335	$ 205,905,618	76.351%	$ 2,028,517,123	76.939%	$ 97,339,469	76.351%	$ 205,905,618	$ 2,125,856,592	76.913%
Alameda Health System	-	0.000%	-	50,652,924	18.782%	477,641,781	18.116%	23,945,577	18.782%	50,652,924	501,587,358	18.147%
Superior Court	-	0.000%	-	9,789,834	3.630%	92,315,179	3.501%	4,628,029	3.630%	9,789,834	96,943,208	3.507%
First 5	-	0.000%	-	1,022,889	0.379%	9,645,534	0.366%	483,559	0.379%	1,022,889	10,129,093	0.366%
Housing Authority	-	0.000%	-	1,213,308	0.450%	11,441,128	0.434%	573,577	0.450%	1,213,308	12,014,705	0.435%
LARPD	-	0.000%	-	1,100,236	0.408%	15,284,738	0.580%	520,124	0.408%	1,100,236	15,804,862	0.572%
ACOE[2]	-	0.000%	-	-	0.000%	1,666,157	0.063%	-	0.000%	-	1,666,157	0.060%
Total for All Employers	**$ 93,829,624**	**100.000%**	**$ 971,674,335**	**$ 269,684,809**	**100.000%**	**$ 2,636,511,640**	**100.000%**	**$ 127,490,335**	**100.000%**	**$ 269,684,809**	**$ 2,764,001,975**	**100.000%**

[1] The unrounded percentages are used in the allocation of the NPL amongst the employers.

[2] Allocated based on the actual employer contributions within each membership class.

[3] In prior years, the unrounded percentages above were used in estimating the allocation of member contributions for purposes of determining pension expense amongst the employers. This practice was continued through December 31, 2017 even though ACERA has provided the actual member contribution by employer, as the difference between the actual and the estimated member contributions would only have the primary impact of changing the timing on when pension expense would have to be recognized by individual employers. Beginning with the December 31, 2018 actuarial valuation, ACERA has provided the Actuary with actual Pension Plan benefit payments by the membership classes presented above: General (excluding ACOE and LARPD); General ACOE; General LARPD; and Safety (in addition to the actual member contributions by employers). Therefore, the actual Pension Plan benefit payments for those four membership classes are now used as well as the actual member contributions by employer within each of the four membership classes for purposes of determining pension expense amongst the employers. This is consistent with how the valuation value of assets was developed in the funding actuarial valuation.

[4] Allocated based on the actual employer contributions in total. ACOE was not required to make any Pension Plan contributions during 2018 because their payroll was $0 in 2018. However, they are required to make a contribution under the Declining Employer Payroll Policy starting 2019. As they would be expected to make a large lump sum contribution to partially pay off their liability, the actuary would consult with ACERA on whether any special adjustment needs to be made when reporting their non-OPEB SRBR NPL next year.

See accompanying notes, pages 5 -7.

Alameda County Employees' Retirement Association (ACERA)
Schedule of Pension Amounts by Employer
As of and for the Year Ended December 31, 2018

		Deferred Outflows of Resources					Deferred Inflows of Resources					Pension Expense		
Schedule of Employer Allocations	**Net Pension Liability**	**Differences Between Expected and Actual Experience**	**Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments**	**Changes of Assumptions**	**Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Deferred Outflows of Resources**	**Differences Between Expected and Actual Experience**	**Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments**	**Changes of Assumptions**	**Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Deferred Inflows of Resources**	**Proportionate Share of Plan Pension Expense**	**Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions**	**Total Employer Pension Expense**
Alameda County	$ 2,125,856,592	$ 19,752,967	$ 227,497,573	$ 273,034,940	$ 2,466,421	$ 522,751,901	$ 36,780,980	$ -	$ 28,906,056	$ 6,013,423	$ 71,700,459	$ 413,358,952	$ (440,550)	$ 412,918,402
Alameda Health System	501,587,358	609,653	62,503,140	69,408,590	8,849,129	141,370,512	13,240,156	-	7,110,910	644,039	20,995,105	103,810,164	2,022,053	105,832,217
Superior Court	96,943,208	117,829	12,080,159	13,414,795	64,308	25,677,091	2,558,963	-	1,374,346	4,469,239	8,402,548	20,063,683	(1,443,652)	18,620,031
First 5 of Alameda County	10,129,093	12,311	1,262,193	1,401,642	253,455	2,929,601	267,373	-	143,598	57,626	468,597	2,096,351	24,723	2,121,074
Housing Authority	12,014,705	14,603	1,497,161	1,662,569	80,751	3,255,084	317,147	-	170,330	339,684	827,161	2,486,602	(112,051)	2,374,551
LARPD	15,804,862	3,661,300	1,701,476	1,518,478	30,864	6,912,118	963,069	-	154,457	132,281	1,249,807	2,657,467	(24,898)	2,632,569
ACOE	1,666,157	1,086,897	267,129	-	4,996	1,359,022	-	-	-	93,632	93,632	312,131	(25,625)	286,506
Total for All Employers	**$ 2,764,001,975**	**$ 25,255,560**	**$ 306,808,831**	**$ 360,441,014**	**$ 11,749,924**	**$ 704,255,329**	**$ 54,127,688**	**$ -**	**$ 37,859,697**	**$ 11,749,924**	**$ 103,737,309**	**$ 544,785,350**	**$ -**	**$ 544,785,350**

See accompanying notes, pages 5 -7.

Alameda County Employees' Retirement Association (ACERA)
Notes to the Schedule of Employer Allocations and Schedule of Pension Amounts by Employer
As of and for the Year Ended December 31, 2018

1. PLAN DESCRIPTION

ACERA is a cost-sharing multiple-employer defined benefit pension plan. The pension plan provides basic lifetime retirement, disability, and death benefits to members who meet the minimum age and length-of-service requirements. ACERA meets member and beneficiary obligations through member contributions, participating employer contributions, and investment income.

2. SUMMARY OF SIGNIFICANT ACCOUNTING AND REPORTING POLICIES

Basis of Accounting

ACERA follows generally accepted accounting principles and reporting guidelines set forth by the Governmental Accounting Standards Board (GASB). The schedule of employer allocations and schedule of pension amounts by employer are prepared on the accrual basis of accounting. Employer and employee contributions are recognized when due, pursuant to formal commitments as well as statutory or contractual requirements.

Estimates

The preparation of the schedule of employer allocations and schedule of pension amounts by employer in accordance with generally accepted accounting principles in the United States requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly, actual results may differ from those estimates.

Contributions

Member and employer contribution rates are based on recommendations made by an independent actuary and adopted by the Board of Retirement. These rates are based on membership type (General and Safety) and tier (Tiers 1, 2, 3, and 4). Active members are required by statute to contribute toward pension plan benefits. Participating employers are required by statute to contribute the necessary amounts to fund estimated benefits not otherwise funded by member contributions or expected investment earnings.

3. ACTUARIAL METHODS AND ASSUMPTIONS

An actuarial valuation is performed for the pension plan on an annual basis. ACERA retains an independent actuarial firm to conduct the actuarial valuations and to establish the contribution rate requirements for the plan.

Actuarial Methods and Assumptions Used to Determine Total Pension Liability

The components of the collective net pension liability of the plan as of December 31, 2018 and December 31, 2017 are as follows:

(Dollars in thousands)	12/31/2018	12/31/2017
Total Pension Liability	$9,535,149	$9,123,900
Less: Plan Fiduciary Net Position	6,771,147	7,110,224
Net Pension Liability	**$2,764,002**	**$2,013,676**

The Net Pension Liability (NPL) was measured as of December 31, 2018 and 2017. Plan Fiduciary Net Position (FNP) was valued as of the measurement date while the Total Pension Liability (TPL) was determined by rolling forward the TPL from actuarial valuations as of December 31, 2017 and 2016, respectively.

The TPL and plan FNP include liabilities and assets for non-health postemployment benefits (non-OPEB). The assets for non-OPEB are held in the SRBR to pay non-vested Supplemental COLA and the retired death benefit. The TPL as December 31, 2018 has been adjusted to include an additional $164.1 million, calculated by rolling forward the total unlimited non-OPEB Actuarial Accrued Liability (AAL) as of December 31, 2017. The TPL as December 31, 2017 has been adjusted to include an additional $149.3 million, calculated by rolling forward the total unlimited non-OPEB AAL as of December 31, 2016 that was calculated under the new actuarial assumptions effective for the December 31, 2017 valuation.

The plan FNP as of December 31, 2018 was also adjusted to include $36.6 million ($39.3 million set aside in the SRBR reserve to pay non-OPEB benefits and by subtraction $2.7 million to reflect the proportion of deferred investment losses that is commensurate with the size of the non-OPEB reserve). The plan FNP as of December 31, 2017 was also adjusted to include $43.9 million ($37.5 million set aside in the SRBR reserve to pay non-OPEB benefits and by adding $6.4 million to reflect the proportion of one-half of the net deferred investment gain that is commensurate with the size of those reserves).

The liability and assets associated with the OPEB component of the SRBR have been excluded from the total pension liability and the fiduciary net position reported above.

The TPLs as of December 31, 2018 and 2017 were determined by actuarial valuations as of December 31, 2017 and 2016, respectively. The actuarial assumptions used to develop the December 31, 2018 and 2017 TPLs are the same assumptions used in the December 31, 2018 and 2017 funding valuations, respectively. These assumptions were applied to all periods included in the measurement:

Valuation Date	**December 31, 2018**	**December 31, 2017**
Inflation	3.00%	3.00%
Salary Increases	General: 3.90% to 8.30% and Safety: 4.30% to 11.30%, vary by service, including inflation	General: 3.90% to 8.30% and Safety: 4.30% to 11.30%, vary by service, including inflation
Investment Rate of Return	7.25% , net of pension plan investment expense, including inflation	7.25% , net of pension plan investment expense, including inflation
Mortality Tables	Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, projected generationally with the two-dimensional MP-2016 projection scale for future mortality improvements based on review of the mortality experience in the December 1, 2013 - November 30, 2016 Actuarial Experience Study.	RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, adjusted for future mortality improvements based on a review of the mortality experience in the December 1, 2013 - November 30, 2016 Actuarial Experience Study.
Date of Experience Study	December 1, 2013 through November 30, 2016	December 1, 2013 through November 30, 2016

Changes to NPL Allocation Methodology

The Board of Retirement adopted the Declining Employer Payroll Policy on October 18, 2018 and determined that the Policy applied to the Alameda County Office of Education (ACOE) and the Livermore Area Recreation and Park District (LARPD) Tier-1 members who were included as part of the General (non-LARPD Tier-3 and Tier-4) membership class in prior funding and GASB valuations. As a result, an asset share calculated in accordance with the Policy was allocated to each of these two employers as of December 31, 2017. In addition, because the allocated assets were less than the actuarial accrued liability (AAL) attributable to these Tier-1 members for each of the two employers, there was also an implicit allocation of unfunded actuarial accrued liability (UAAL).

Pursuant to the Declining Employer Payroll Policy, (1) changes in assets and AAL for ACOE have been tracked separately since January 1, 2018, and effective with the December 31, 2018 valuation ACOE is in its own separate membership class and ACOE's NPL was determined separately; (2) changes in assets and AAL for LARPD Tier-1 members have been tracked separately since January 1, 2018, and effective with the December 31, 2018 valuation the assets and AAL for LARPD Tier-3 and Tier-4, forming a new combined membership class that includes LARPD members from all tiers.

Discount Rate

The discount rate used to measure the TPL as of December 31, 2018 and 2017 was 7.25%. In order to reflect the provisions of Article 5.5 of the Statute, future allocations of 50% excess earnings to the Supplemental Retiree Benefits Reserve (SRBR) have been treated as an additional outflow against the plan's FNP in the Governmental Accounting Standards Board (GASB) crossover test. It is estimated that the additional outflow would average approximately 0.60% of assets over time, based on the results of the actuary's stochastic modeling of the 50% allocation of future excess earnings to the SRBR.

The projection of cash flows used to determine the discount rates assumes plan member contributions will be made at the current member contribution rates, and that employer contributions will be made at rates equal to the actuarially determined contributions rates[1] plus additional future contributions that would follow from the allocation of excess earnings to the SRBR. Projected employer contributions that are intended to fund the service cost for the future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the pension plan's FNP was projected to be available to make all projected future benefit payments for the current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL as of December 31, 2018 and 2017.

4. SUBSEQUENT EVENT

As of December 31, 2018, ACOE's balance of the unfunded actuarial accrued liability was $1.7 million. Pursuant to the new Declining Employer Payroll Policy, ACOE made a $750 thousand payment in March 2019 to reduce its unfunded actuarial accrued liability.

5. ADDITIONAL FINANCIAL AND ACTUARIAL INFORMATION

Additional financial and actuarial information supporting the schedule of employer allocations and schedule of pension amounts by employer can be obtained from ACERA's Comprehensive Annual Financial Report for the year ended December 31, 2018, and ACERA's GASB 68 Actuarial Valuation Based on December 31, 2018 Measurement Date for Employer Reporting as of June 30, 2019.

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[1] *For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included.*

Alameda County Employees' Retirement Association (ACERA)

Schedule of Employer Allocations and Schedule of OPEB Amounts by Employer

As of and for the Years Ended December 31, 2018

Alameda County Employees' Retirement Association (ACERA)

Schedule of Employer Allocations and Schedule of OPEB Amounts by Employer

As of and for the Year Ended December 31, 2018

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Independent Auditor's Report

Board of Retirement
Alameda County Employees' Retirement Association
Oakland, California

We have audited the accompanying schedule of employer allocations of the Alameda County Employees' Retirement Association (ACERA), as of and for the year ended December 31, 2018, and the related notes. We have also audited the columns titled net OPEB liability, total deferred outflows of resources, total deferred inflows of resources, and the total OPEB expense (specified column totals) included in the accompanying schedule of OPEB amounts by employer of ACERA as of and for the year ended December 31, 2018, and the related notes.

Management's Responsibility for the Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on the schedule of employer allocations and the specified column totals included in the schedule of OPEB amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified column totals included in the schedule of OPEB amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and specified column totals included in the schedule of OPEB amounts by employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the schedule of employer allocations and specified column totals included in the schedule of OPEB amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and specified column totals included in the schedule of OPEB amounts by employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and specified column totals included in the schedule of OPEB amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and net OPEB liability, total deferred outflows of resources, total deferred inflows of resources, and total OPEB expense for ACERA as of and for the year ended December 31, 2018, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of ACERA as of and for the year ended December 31, 2018, and our report thereon, dated June __, 2019, expressed an unmodified opinion on those financial statements.

Restriction on Use

Our report is intended solely for the information and use of ACERA management, the Board of Retirement, ACERA employers and their auditors, and is not intended to be and should not be used by anyone other than these specified parties.

Oakland, California
June __, 2019

Alameda County Employees' Retirement Association (ACERA)
Schedule of Employer Allocations as of and for the Year Ended December 31, 2018
Actual Employer Contributions by Employer and Net OPEB Liability (NOL) Allocation

	Actual Employer Contributions by Employer for the Year Ended December 31, 2018		Allocation of Net OPEB Liability as of December 31, 2018	
Employer	**Contributions**	**Contribution Percentage[1]**	**NOL**	**Contribution Percentage**
Alameda County	$ 205,905,618	76.351%	$ 177,817,632	76.351%
Alameda Health System	50,652,924	18.782%	43,743,260	18.782%
Superior Court	9,789,834	3.630%	8,454,384	3.630%
First 5	1,022,889	0.379%	883,354	0.379%
Housing Authority	1,213,308	0.450%	1,047,799	0.450%
LARPD	1,100,236	0.408%	950,150	0.408%
Office of Education (ACOE)[2]	-	0.000%	-	0.000%
Total for All Employers	**$ 269,684,809**	**100.000%**	**$ 232,896,579**	**100.000%**

[1] The unrounded percentages are used in the allocation of the NOL amongst the employers.
[2] ACOE was not required to make any Pension Plan contributions during 2018 because their payroll was $0 in 2018. However, they are required to make a contribution under the Declining Employer Payroll Policy starting 2019. As they would be expected to make a large lump sum contribution to partially pay off their liability in 2019, the actuary would consult with ACERA on whether any special adjustment needs to be made when reporting their NOL next year.

See accompanying notes, pages 5 - 7.

Alameda County Employees' Retirement Association (ACERA)
Schedule of OPEB Amounts by Employer
As of and for the Year Ended December 31, 2018

		Deferred Outflows of Resources					Deferred Inflows of Resources					OPEB Expense		
Schedule of Employer Allocations	**Net OPEB Liability**	**Differences Between Expected and Actual Experience**	**Net Difference Between Projected and Actual Investment Earnings on OPEB Plan Investments**	**Changes of Assumptions**	**Changes in Proportion of Employer Contributions**	**Total Deferred Outflows of Resources**	**Differences Between Expected and Actual Experience**	**Net Difference Between Projected and Actual Investment Earnings on OPEB Plan Investments**	**Changes of Assumptions**	**Changes in Proportion of Employer Contributions**	**Total Deferred Inflows of Resources**	**Proportionate Share of Plan OPEB Expense**	**Net Amortization of Deferred Amounts from Changes in Proportion of Employer Contributions**	**Total Employer OPEB Expense**
Alameda County	$ 177,817,632	$ -	$ 43,618,321	$ 31,545,444	$ 74,606	$ 75,238,371	$ 29,555,406	$ -	$ 7,418,434	$ 470,109	$ 37,443,949	$ 30,479,733	$ (87,294)	$ 30,392,439
Alameda Health System	43,743,260	-	10,730,137	7,760,201	838,503	19,328,841	7,270,650	-	1,824,940	-	9,095,590	7,498,034	175,547	7,673,581
Superior Court	8,454,384	-	2,073,844	1,499,836	-	3,573,680	1,405,219	-	352,711	334,671	2,092,601	1,449,166	(65,467)	1,383,699
First 5 of Alameda County	883,354	-	216,685	156,710	12,897	386,292	146,824	-	36,853	2,566	186,243	151,416	1,727	153,143
Housing Authority	1,047,799	-	257,023	185,883	-	442,906	174,157	-	43,713	25,849	243,719	179,603	(5,451)	174,152
LARPD	950,150	-	233,070	168,560	-	401,630	157,926	-	39,640	84,296	281,862	162,865	(17,242)	145,623
ACOE	-	-	-	-	-	-	-	-	-	8,515	8,515	-	(1,820)	(1,820)
Total for All Employers	**$ 232,896,579**	**$ -**	**$ 57,129,080**	**$ 41,316,634**	**$ 926,006**	**$ 99,371,720**	**$ 38,710,182**	**$ -**	**$ 9,716,291**	**$ 926,006**	**$ 49,352,479**	**$ 39,920,817**	**$ -**	**$ 39,920,817**

See accompanying notes, pages 5 - 7.

Alameda County Employees' Retirement Association (ACERA)
Notes to the Schedule of Employer Allocations and Schedule of OPEB Amounts by Employer
As of and for the Year Ended December 31, 2018

1. PLAN DESCRIPTION

ACERA administers a non-vested medical benefits program for eligible retired members. The benefits include medical, dental and vision subsidies as well as Medicare Part B premium reimbursement. The subsidies are paid from the 401(h) account in the form of a monthly medical allowance. The maximum levels of the monthly medical allowances are reviewed annually by the Board of Retirement.

Retired members with a minimum of ten years of service credit or those retired with service connected disability are eligible to receive monthly medical, dental and vision allowance benefits if they enroll in one of the ACERA sponsored medical plans or Medicare exchange. Retired members eligible for the monthly medical allowance benefit may also be reimbursed for the lowest standard Medicare Part B premium with proof of enrollment in Medicare Part B.

2. SUMMARY OF SIGNIFICANT ACCOUNTING AND REPORTING POLICIES

Basis of Accounting

ACERA follows generally accepted accounting principles and reporting guidelines set forth by the Governmental Accounting Standards Board (GASB). The schedule of employer allocations and schedule of OPEB amounts by employer are prepared on the accrual basis of accounting. Employer and employee contributions are recognized when due, pursuant to formal commitments as well as statutory or contractual requirements.

Estimates

The preparation of the schedule of employer allocations and schedule of OPEB amounts by employer in accordance with generally accepted accounting principles in the United States requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly, actual results may differ from those estimates.

Contributions

There are no legal or contractual contribution requirements for the OPEB plan. Funding for the OPEB plan relies entirely on semi-annual earnings allocations from the total fund to the Supplemental Retiree Benefits Reserve (SRBR) as mandated by Article 5.5 of the 1937 Act. The OPEB assets are held in the 401(h) account and the SRBR to pay the non-vested benefits.

3. ACTUARIAL METHODS AND ASSUMPTIONS

An actuarial valuation is performed for the OPEB plan on an annual basis. ACERA retains an independent actuarial firm to conduct the actuarial valuations.

Actuarial Methods and Assumptions Used to Determine Total OPEB Liability

The components of the collective Net OPEB Liability of the plan as of December 31, 2018 and December 31, 2017 are as follows:

(Dollars in thousands)	12/31/2018	12/31/2017
Total OPEB Liability	$1,054,337	$ 1,029,354
Less: Plan Fiduciary Net Position	821,440	1,001,876
Net OPEB Liability	**$ 232,897**	**$ 27,478**

The TOL as of December 31, 2018 was determined by rolling forward the liability results used in determining the sufficiency of the SRBR to provide medical and dental subsidy benefits as of December 31, 2017. The TOL has been adjusted to reflect the health care trend assumptions used in the sufficiency study for the SRBR as of December 31, 2018.

Alameda County Employees' Retirement Association (ACERA)
Notes to the Schedule of Employer Allocations and Schedule of OPEB Amounts by Employer
As of and for the Year Ended December 31, 2018

The TOL as of December 31, 2017 was determined by rolling forward the liability results used in determining the sufficiency of the SRBR to provide medical and dental subsidy benefits as of December 31, 2016. The TOL has been adjusted to reflect the new economic and non-economic actuarial assumptions proposed in the December 1, 2013 through November 30, 2016 experience study and approved by the Board for the December 31, 2017 valuation as well as the health care trend assumptions recommended for the sufficiency study for the SRBR as of December 2017.

The OPEB plan's FNP as of December 31, 2018 of $821.4 million was calculated by taking the $890.0 million in the SRBR and 401(h) account set aside by the Retirement Board to pay OPEB benefits as of December 31, 2018, reduced by the estimated implicit subsidy SRBR transfer to Employer Advance Reserve of $6.9 million, less $61.6 million to reflect the proportionate share of the deferred investment losses after adjustment to include the balance of the Contingency Reserve that was commensurate with the size of the OPEB reserve. In determining the OPEB plan's FNP as of December 31, 2017 of $1,001.9 million, the assets set aside in the OPEB SRBR reserve and the 401(h) account of $863.8 million reduced by the estimated implicit subsidy SRBR transfer to the Employers Advance Reserve of $5.8 million, plus $143.9 to reflect the proportionate share of one half of the deferred market gains after adjustment to include the balance in the Contingency Reserve that was commensurate with the size of the OPEB and Non-OPEB reserves.

These assumptions were applied to all periods included in the measurement:

Valuation Date	**December 31, 2018**	**December 31, 2017**
Investment Rate of Return	7.25% , net of pension plan investment expense, including inflation	7.25% , net of pension plan investment expense, including inflation
Inflation	3.00%	3.00%
Health Care Premium Trend Rates		
Non-Medicare Medical Plan	Graded from 7.00% to ultimate 4.50% over 10 years	Graded from 7.00% to ultimate 4.50% over 10 years
Medicare Medical Plan	Graded from 6.50% to ultimate 4.50% over 8 years	Graded from 6.50% to ultimate 4.50% over 8 years
Dental / Vision	4.00%	4.50%
Medicare Part B	4.00%	4.50%
Other Assumptions	Same as those proposed in the experience study for the period December 1, 2013 through November 30, 2016	Same as those proposed in the experience study for the period December 1, 2013 through November 30, 2016

Discount Rate

The discount rate used to measure the TOL as of December 31, 2018 and 2017 was 7.25%. In order to reflect the provisions of Article 5.5 of the Statute, future allocation of excess earnings to the SRBR have been treated as an additional outflow against the pension plan's FNP. Based on the results of the actuary's stochastic modeling of 50% allocation of future excess earnings to the SRBR would have the same impact as an outflow that would average approximately 0.60% of pension plan assets over time. This approximated outflow along with the additional future employer contributions that would result from those future allocations of excess earnings to the SRBR were incorporated into the GASB 67 crossover test for the pension plan. The crossover test for the OPEB SRBR includes projected benefits which equal to the OPEB assets currently available in the SRBR as the remaining OPEB SRBR benefits would be paid from future excess earnings.

The projection of cash flows used to determine the discount rates assumed benefits are paid out of current OPEB SRBR assets. Based on those assumptions, the SRBR OPEB plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments for the current plan members. Therefore the long-term expected rate of return on the OPEB plan investments was applied to all periods of projected benefits payments to determine the Total OPEB Lability as of December 31, 2018 and December 31, 2017.

4. ADDITIONAL FINANCIAL AND ACTUARIAL INFORMATION

Additional financial and actuarial information supporting the schedule of employer allocations and schedule of OPEB amounts by employer can be obtained from ACERA's Comprehensive Annual Financial Report for the year ended December 31, 2018, and ACERA's GASB 75 Actuarial Valuation Based on December 31, 2018 Measurement Date for Employer Reporting as of June 30, 2019.

ACERA

MEMORANDUM TO THE AUDIT COMMITTEE

DATE: June 20, 2019

TO: Members of the Audit Committee

FROM: Margo Allen, Fiscal Services Officer

SUBJECT: **Governmental Accounting Standards Board (GASB) Statement No. 68 and GASB Statement No. 75 Actuarial Valuations Based on December 31, 2018, Measurement Date for Employer Reporting as of June 30, 2019**

Executive Summary

Attached for review and discussion are the GASB Statement No. 68 and Statement No. 75 Actuarial Valuations Based on December 31, 2018, Measurement Date for Employer Reporting as of June 30, 2019 (i.e., GASB 68/75 actuarial valuations). The purpose of the GASB 68/75 actuarial valuations is to provide information required for employer pension and OPEB liability reporting, respectively.

During the June 20, 2019, Audit Committee meeting, Andy Yeung and Eva Yum, Segal Consulting, will present and discuss the GASB 68/75 actuarial valuations, which include a complete set of schedules, note disclosures, and required supplementary information necessary for the participating employers to complete their June 30, 2019, fiscal year-end financial reporting requirements.

Once the Board adopts the audited set of schedules, staff will distribute the schedules and the GASB 68/75 actuarial valuations to ACERA's participating employers accompanied by the following disclaimer:

> "To complete financial statements, each participating employer will need to record its own proportionate share of the collective pension and OPEB amounts for all benefits provided through the Alameda County Employees' Retirement Association's (ACERA) cost-sharing, multi-employer, defined-benefit pension plan. ACERA has provided the *Schedule of Employer Allocations* and the *Schedule of Pension Amounts by Employer*, with related notes, prepared by ACERA using Segal Consulting's Addenda to the Governmental Accounting Standards Board Statement No. 67 and Statement No. 74 Valuations as of December 31, 2018, and audited by independent auditor Williams, Adley & Company-CA, LLP, in accordance with the AICPA recommendation. The Governmental Accounting Standards Board Statement No. 68 and Statement No. 75 Actuarial Valuations Based on December 31, 2018, Measurement Date for Employer Reporting as of June 30, 2019, were prepared in accordance with the methodology set forth in the Governmental Accounting Standards Board Statement No. 68 and Statement No. 75 and are based on data maintained and provided by ACERA. Please note that ACERA is not responsible for employers' compliance with the requirements of Governmental Accounting Standards Board Statement No. 68 and Statement No. 75. Employers are solely responsible for accurately presenting financial statements within the requirements of the Governmental Accounting Standards Board Statement No. 68 and Statement No. 75."

Segal Consulting

Alameda County Employees' Retirement Association

Governmental Accounting Standards Board (GASB) Statement 68
Actuarial Valuation Based on December 31, 2018
Measurement Date for Employer Reporting as of June 30, 2019

This report has been prepared at the request of the Board of Retirement to assist the sponsors of the Fund in preparing their financial report for their liabilities associated with the ACERA pension plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Retirement and may only be provided to other parties in its entirety. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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

June 12, 2019

Board of Retirement
Alameda County Employees' Retirement Association
475 14th Street, Suite 1000
Oakland, CA 94612

Dear Board Members:

We are pleased to submit this Governmental Accounting Standards Board (GASB) Statement No. 68 Actuarial Valuation based on a December 31, 2018 measurement date for employer reporting as of June 30, 2019. It contains various information that will need to be disclosed in order for ACERA employers to comply with GASB 68.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist the sponsors in preparing their financial report for their liabilities associated with the ACERA pension plan. The census and financial information on which our calculations were based was provided by ACERA. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. 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 (such as the end of an amortization period); and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of Eva Yum, FSA, MAAA, 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 the 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 expectations for the Retirement Association.

We look forward to reviewing this report with you and to answering any questions.

Sincerely,

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

By: Andy Yeung / Eva Yum

Andy Yeung, ASA, MAAA, FCA, EA	*Eva Yum, FSA, MAAA, EA*
Vice President and Actuary	*Senior Actuary*

JB/

SECTION 1

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Purpose

This report has been prepared by Segal Consulting ("Segal") to present certain disclosure information required by Governmental Accounting Standards Board (GASB) Statement 68 for employer reporting as of June 30, 2019. The results used in preparing this GASB 68 report are comparable to those used in preparing the Governmental Accounting Standards Board Statement 67 report for the plan based on a reporting date and a measurement date as of December 31, 2018. This valuation is based on:

- The benefit provisions of the Retirement Association, as administered by the Board of Retirement;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of November 30, 2017, provided by the Retirement Association;
- The assets of the Plan as of December 31, 2018, provided by the Retirement Association;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

General Observations on GASB 68 Actuarial Valuation

The following points should be considered when reviewing this GASB 68 report:

- The Governmental Accounting Standards Board (GASB) rules only define pension liability and expense for financial reporting purposes, and do not apply to contribution amounts for pension funding purposes. Employers and plans develop and adopt funding policies under current practices.
- When measuring pension liability, GASB uses the same actuarial cost method (Entry Age) and the same type of discount rate (expected return on assets) as ACERA uses for funding. This means that the Total Pension Liability (TPL) measure for financial reporting shown in this report is determined on generally the same basis as ACERA's Actuarial Accrued Liability (AAL) measure for funding. We note that the same is generally true for the Normal Cost component of the annual plan cost for funding and financial reporting.
- The Net Pension Liability (NPL) is equal to the difference between the TPL and the Plan's Fiduciary Net Position. The Plan's Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) calculated on a market value basis.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

- The Board of Retirement adopted the Declining Employer Payroll Policy on October 18, 2018 and determined that the Policy applied to the Alameda County Office of Education (ACOE) and the Livermore Area Recreation and Park District (LARPD) Tier 1 members who were included as part of the General (non-LARPD Tier 3 and Tier 4) membership class in our prior funding and GASB valuations. As a result, an asset share calculated in accordance with that Policy was allocated to each of these two employers as of December 31, 2017. In addition, because the allocated assets were less than the actuarial accrued liability (AAL) attributable to these Tier 1 members for each of the two employers, there was also an implicit allocation of unfunded actuarial accrued liability (UAAL).
- Pursuant to the Declining Employer Payroll Policy, changes in assets and AAL for ACOE have been tracked separately since January 1, 2018, and effective with the December 31, 2018 valuation ACOE is in its own separate membership class. Therefore, we have determined ACOE's NPL as of December 31, 2018 separately, in a manner consistent with past practice for each existing membership class.

  For reference, as of December 31, 2017 there was no NPL allocated to ACOE based on the method of allocating NPL to employers within the General (non-LARPD Tier 3 and Tier 4) membership class in proportion to each employer's contribution amounts relative to the total for the group. (ACOE did not make any contributions during 2017 as their payroll decreased to $0 in 2017.)

  Also pursuant to the Declining Employer Payroll Policy, changes in assets and AAL for LARPD Tier 1 members have been tracked separately since January 1, 2018, and effective with the December 31, 2018 valuation the assets and AAL for LARPD Tier 1 members were combined with the assets and AAL for LARPD Tier 3 and Tier 4, forming a new combined membership class that includes LARPD members from all tiers. Accordingly, the NPL attributable to LARPD Tier 1 members that was previously allocated proportionally from the General (non-LARPD Tier 3 and Tier 4) membership class is now determined directly as a part of the NPL for the entire LARPD membership class.[1]

---

[1] *The TPL, plan assets, deferred inflows, and deferred outflows allocated to the LARPD Tier 1 members as of December 31, 2017 (based on LARPD Tier 1 employer contributions) have been moved from the General (excluding LARPD Tier 3 and Tier 4) membership class to the new General LARPD membership class as of December 31, 2017 for purposes of reflecting the implementation of the Declining Employer Payroll Policy for the measurement date as of December 31, 2018.*

The prior General (excluding LARPD Tier 3 and Tier 4) membership class as referenced throughout this report is now referred to as the General (excluding ACOE and LARPD) membership class. The changes in the beginning of year NPL for ACOE, LARPD and General (excluding ACOE and LARPD) due to the application of the Declining Employer Payroll Policy that we use to calculate the pension expense for 2018 are provided in Appendix C in Section 3.

Please note that the above changes in the calculation of the NPL are only with respect to the liabilities for the Pension Plan. The calculation of the NPL for the non-vested Supplemental COLA and retired member death benefits (non-OPEB) paid by the SRBR (in proportion to employers' contribution amounts to the Pension Plan for the Association as a whole) is unchanged.

- As we disclosed in our December 31, 2018 funding valuation report, the 7.25% investment return assumption that the Board approved on December 21, 2017 for determining the liabilities for funding purposes and used for establishing the employer and employee contribution rates has continued to be developed without considering the impact of any future 50/50 excess earnings allocation. This is based on our understanding that Article 5.5 of the Statute, which authorizes the allocation of 50% of excess earnings to the SRBR, does not allow for the use of a different investment return for funding than is used for interest crediting. This would appear in effect to preclude the prefunding of the SRBR through the use of an assumption lower than the market earnings assumption of 7.25%.

  As required by the Actuarial Standard of Practice (ASOP) No. 4 ("Measuring Pension Obligations and Determining Pension Plan Costs or Contributions"), we performed a stochastic model to estimate the impact of the 50% allocation of future excess earnings to the SRBR. The results of our model indicated that the 50/50 allocation of future excess earnings would have about the same impact as an "outflow" (i.e., assets not available to fund the benefits included in the determination of the TPL) that would average approximately 0.60% of assets over time. This approximated outflow was incorporated into our GASB crossover test[2] (Appendix A), along with the additional future employer contributions that would result from those future allocations of excess earnings to the SRBR under ACERA's funding policy.

- For this report, the reporting dates for the employer are June 30, 2019 and 2018. The NPL measured as of December 31, 2018 and December 31, 2017 was determined by rolling forward the TPL for the funded benefits as of December 31, 2017 and December 31, 2016, respectively. Similar to last year, we have included in the TPL as of December 31, 2018 the non-OPEB *unlimited* Actuarial Accrued Liability (AAL) of $164.1 million, which was calculated by rolling forward the total unlimited non-OPEB AAL as of December 31, 2017.

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[2] *The purpose of the GASB crossover test is to determine if the full expected return (or 7.25% in this case) can be used as the discount rate to determine the TPL and the NPL. That is, if there is no crossover point where the projected benefit payments would exceed the Plan's Fiduciary Net Position, then the full expected return assumption can be used. As detailed later in this report, ACERA does pass the crossover test, which means that the full 7.25% investment rate of return assumption can be used as the discount rate to determine the TPL and the resulting NPL.*

- We have also continued the practice of adjusting the Plan's Fiduciary Net Position as of December 31, 2018 to include the $39.3 million set aside by the Retirement Board in the SRBR reserve to pay non-vested Supplemental COLA and retired member death benefits (non-OPEB)[3] as of December 31, 2018. It should be noted that as of December 31, 2018, the deferred investment loss for the entire Plan was $569.1 million and the Contingency Reserve was $0. Consequently, we have subtracted from the Plan's Fiduciary Net Position the proportionate share of the deferred investment loss that is commensurate with the size of the non-OPEB SRBR reserve, or $2.7 million (which will cause the future interest crediting rate to the SRBR reserve to drop below 7.25% per year). The net effect of the adjustments to the Plan's Fiduciary Net Position as of December 31, 2018 for non-OPEB SRBR benefits was an addition of $36.6 million.

  Note that the proportionate share of the deferred market loss as of December 31, 2018 for the Pension Plan was equal to $504.8 million, and in calculating the Plan's Fiduciary Net Position we have adjusted the Pension Plan's valuation value of assets in the funding valuation to reflect that amount.

- The $127.5 million difference between the $164.1 million added to the TPL and the net $36.6 million added to the Plan's Fiduciary Net Position as of December 31, 2018 represents the NPL attributable to non-OPEB SRBR benefits.
- The NPL increased from $2,014 million as of December 31, 2017 to $2,764 million as of December 31, 2018, primarily as a result of the unfavorable investment return during calendar year 2018 of about $727 million. Changes in these values during the last two fiscal years ending December 31, 2017 and December 31, 2018 can be found in Exhibit 5.
- The discount rate used to determine the TPL and NPL as of December 31, 2018 and 2017 was 7.25%, based on the assumption that was used by the Association in the pension funding valuations as of those dates. The detailed calculations of the discount rate of 7.25% used in the calculation of the TPL and NPL as of December 31, 2018 can be found in Appendix A of Section 3. Various other information that is required to be disclosed can be found throughout Exhibits 1 through 13 in Section 2.
- Results shown in this report exclude any employer contributions made after the measurement date of December 31, 2018. The employer should consult with their auditors to determine the deferred outflow that should be created for these contributions.

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[3] *We have excluded the liability and the assets associated with the retiree health (OPEB) component of the SRBR reserve account because it is our understanding that those amounts are reportable under GASB 74/75.*

Summary of Key Valuation Results

Reporting Date for Employer under GASB 68 Measurement Date for Employer under GASB 68	06/30/2019[1] 12/31/2018	06/30/2018[2] 12/31/2017
Disclosure elements for plan year ending December 31:		
1. Service cost[3]	$209,890,150	$187,408,672
2. Total Pension Liability	9,535,148,109	9,123,899,264
3. Plan's Fiduciary Net Position[4]	6,771,146,134	7,110,223,325
4. Net Pension Liability	2,764,001,975	2,013,675,939
5. Pension expense	544,785,350	402,989,811
Schedule of contributions for plan year ending December 31:		
6. Actuarially determined contributions	$269,684,809	$247,063,550
7. Actual contributions[5]	269,684,809	247,063,550
8. Contribution deficiency (excess) (6) – (7)	0	0
Demographic data for plan year ending December 31:[6]		
9. Number of retired members and beneficiaries	9,783	9,479
10. Number of vested terminated members[7]	2,568	2,447
11. Number of active members	11,349	11,323
Key assumptions as of December 31:		
12. Investment rate of return	7.25%	7.25%
13. Inflation rate	3.00%	3.00%
14. Projected salary increases[8]	General: 8.30% to 3.90% and Safety: 11.30% to 4.30%	General: 8.30% to 3.90% and Safety: 11.30% to 4.30%

[1] *The reporting date and measurement date for the plan are December 31, 2018.*

[2] *The reporting date and measurement date for the plan are December 31, 2017.*

[3] *Service cost is based on the previous year's valuation, meaning the 12/31/2018 and 12/31/2017 measurement date values are based on the valuations as of December 31, 2017 and December 31, 2016, respectively. The 12/31/2018 measurement date service cost has been calculated using the assumptions shown in the 12/31/2017 measurement date column, and the 12/31/2017 measurement date service cost has been calculated using the following assumptions:*

Key assumptions as of December 31, 2016:	
Investment rate of return	*7.60%*
Inflation rate	*3.25%*
*Projected salary increases**	*General: 7.45% to 4.15% and Safety: 10.45% to 4.45%*

** Includes inflation of 3.25% plus real across-the-board salary increases of 0.50% plus merit and promotional increases.*

[4] *For the 12/31/2018 measurement date, the Plan's Fiduciary Net Position amount shown ($6,771,146,134) includes the net market value of assets ($7,592,586,569) less OPEB-related SRBR assets ($821,440,435). The OPEB-related SRBR assets include $873,183,258 in the SRBR-OPEB reserve (after reducing the reserve by the $6,939,808 SRBR implicit subsidy transfer), and $9,830,102 in the 401(h) reserve, less a proportionate share of the deferred market losses (after adjustment to include the balance in the Contingency Reserve) commensurate with the size of the OPEB reserves ($61,572,926). For the 12/31/2017 measurement date, the Plan's Fiduciary Net Position amount shown ($7,110,223,325) includes the net market value of assets ($8,112,099,556) less OPEB-related SRBR assets ($1,001,876,232). The OPEB-related SRBR assets include $850,423,696 in the SRBR-OPEB reserve (after reducing the reserve by the $5,830,283 SRBR implicit subsidy transfer), and $7,582,098 in the 401(h) reserve, plus a proportionate share of one half of the deferred market gains (after adjustment to include the balance in the Contingency Reserve) commensurate with the size of the OPEB and non-OPEB reserves ($143,870,438). Note that amounts may not total properly due to rounding.*

[5] *Employer contributions are on a net basis after (i) considering the total cash contributions made by the employers, (ii) reducing by the employer contributions made to the 401(h) account, and (iii) increasing by the amount of transfer from the SRBR to the Employers Advance Reserve for employer contributions made to the 401(h) account in (ii).*

[6] *Data as of December 31, 2017 is used in the measurement of the TPL as of December 31, 2018.*

[7] *Includes members who left their contributions on deposit even though they have less than five years of service.*

[8] *Includes inflation at 3.00% plus real across-the-board salary increases of 0.50% plus merit and promotional increases.*

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 an actuarial 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 in this report (as well as the plan summary included in our funding valuation 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 ACERA. 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** This valuation is based on the market value of assets as of the measurement date, as provided by ACERA. The Association uses and "actuarial value of assets" that differs from market value to gradually reflect six-month changes in the market value of assets in determining 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 valuation is prepared at the request of the Board to assist the sponsors of the Fund in preparing items related to the pension plan in their financial reports. 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.
- If ACERA 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 Board should look to their other advisors for expertise in these areas.

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

EXHIBIT 1

General Information – "Financial Statements", Note Disclosures and Required Supplementary Information for a Cost-Sharing Pension Plan

Plan Description

Plan administration. The Alameda County Employees' Retirement Association (ACERA) was established by the Alameda County Board of Supervisors in 1947. ACERA is administered by the Board of Retirement and governed by the County Employees' Retirement Law of 1937 (California Government Code Section 31450 et. seq.). ACERA is a cost-sharing, multiple employer, defined benefit, public employee retirement system whose main function is to provide service retirement, disability, death, and survivor benefits to the General and Safety members employed by the County of Alameda. ACERA also provides retirement benefits to the employee members of First 5 Alameda County, Housing Authority of the County of Alameda, Alameda Health System, Livermore Area Recreation and Park District (LARPD), Superior Court of California—County of Alameda, and Alameda County Office of Education.

The management of ACERA is vested with the ACERA Board of Retirement. The Board consists of nine members and two alternates. The County Treasurer is a member of the Board of Retirement by law and is elected by the general public. Four members are appointed by the Board of Supervisors, one of whom may be a County Supervisor. Two active members are elected by the General members; one active member and one alternate are elected by the Safety members; one retired member and one alternate are elected by the retired members. All members of the Board of Retirement serve terms of three years except for the County Treasurer whose term runs concurrent with his term as County Treasurer.

Plan membership. At December 31, 2018, pension plan membership consisted of the following:

Retired members or beneficiaries currently receiving benefits	9,783
Vested terminated members entitled to, but not yet receiving benefits[1]	2,568
Active members	11,349
Total	23,700

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

Note: Data as of December 31, 2018 is not used in the measurement of the TPL as of December 31, 2018.

Benefits provided. ACERA provides service retirement, disability, death, and survivor benefits to eligible employees. The first date of ACERA membership varies by employer, as follows:

- Alameda County, Alameda Health System and Alameda Superior Court Employees: Membership for these employees is effective on the first day of the second pay period following the employee's hire date in an ACERA covered position. This is the date of entry into ACERA membership. As of the date of entry, payroll deductions for retirement contributions begin and service credit for each hour worked is earned. During the short period between the beginning of employment and the ACERA plan date of entry, the employee does not pay contributions or earn service credit. A member may purchase this service credit (referred to as "days prior to entry") any time before retirement without changing the membership, but date of entry does not change.

- Housing Authority and Livermore Area Recreation and Park District Employees: Membership for these employees is effective on the first day of employee's hire in an ACERA covered position. The first date of employment is the date of entry into ACERA membership. As of this date of entry, payroll deductions for retirement contributions begin and service credit for each hour work is earned.
- First 5 Employees: Membership for these employees is effective on the first day of the second pay period following the employee's hire date.
- Office of Education Employees: This is a closed plan with no more active employees (i.e., there is no new ACERA membership). However, the employer does retain retired members and beneficiaries in the Retirement Association as of the December 31, 2018 valuation date.

There are separate retirement benefits for General and Safety members. Safety membership is extended to those involved in active law enforcement, deferred firefighters, or positions that have been designated as Safety by the Board of Retirement (e.g. Juvenile Hall Group Counselor, Probation Officer, etc.). All other employees are classified as General members.

Any new member who becomes a member on or after January 1, 2013 is placed into Tier 4 and is subject to the provisions of California Public Employees' Pension Reform Act of 2013 (PEPRA), California Government Code 7522 et seq. and Assembly Bill (AB) 197.

General members enrolled in Tiers 1, 2, or 3 are eligible to retire once they attain the age of 70 regardless of service or at age 50 with five or more years of retirement service credit and a total of 10 years of qualifying membership. A non-Tier 4 General member with 30 years of service is eligible to retire regardless of age. General members enrolled in Tier 4 are eligible to retire once they have attained the age of 52 and have acquired five years of retirement service credit, or at age 70 regardless of service.

Safety members enrolled in Tiers 1, 2, 2C, or 2D are eligible to retire once they attain the age of 70 regardless of service or at age 50 with five or more years of retirement service credit and a total of 10 years of qualifying membership. A non-Tier 4 Safety member with 20 years of service is eligible to retire regardless of age. Safety members enrolled in Tier 4 are eligible to retire once they have attained the age of 50 and have acquired five years of retirement service credit, or at age 70 regardless of service.

The retirement benefit the member will receive is based upon age at retirement, final average compensation, years of retirement service credit and retirement plan and tier.

The tiers and their basic provisions are listed below:

Tier Name	Service Retirement Governing Code Section	Effective Date	Basic Provisions	Final Average Salary Period	Plan Sponsors
General Tier 1	§31676.12	Various	2.0% at 57; maximum 3% COLA	Highest 1-year	All
General Tier 2	§31676.1	June 30, 1983*	2.0% at 61; maximum 2% COLA	Highest 3-years	All except LARPD
General Tier 3	§31676.18	October 1, 2008	2.5% at 55; maximum 3% COLA	Highest 1-year	LARPD
General Tier 4	§7522.20(a)	January 1, 2013	2.5% at 67; maximum 2% COLA	Highest 3-years	All
Safety Tier 1	§31664.1	Various	3.0% at 50; maximum 3% COLA	Highest 1-year	County
Safety Tier 2	§31664.1	June 30, 1983	3.0% at 50; maximum 2% COLA	Highest 3-years	County
Safety Tier 2C	§31664	October 17, 2010	2.6% at 55; maximum 2% COLA	Highest 3-years	County
Safety Tier 2D	§31664.2	October 17, 2010	3.0% at 55; maximum 2% COLA	Highest 3-years	County
Safety Tier 4	§7522.25(d)	January 1, 2013	2.7% at 57; maximum 2% COLA	Highest 3-years	County

** For Housing Authority members, the effective date is September 30, 2011.*

For members enrolled in Tiers 1, 2, 2C, 2D, or 3, the maximum monthly retirement allowance is 100% of final compensation. There is no maximum for members enrolled in Tier 4.

The member may elect an unmodified retirement allowance, or choose an optional retirement allowance. The unmodified retirement allowance provides the highest monthly benefit and a 60% continuance to an eligible surviving spouse or domestic partner. An eligible surviving spouse or domestic partner is one married to or registered with the member one year prior to the effective retirement date. There are four optional retirement allowances the member may choose. Each of the optional retirement allowances requires a reduction in the unmodified retirement allowance in order to allow the member the ability to provide certain benefits to a surviving spouse, domestic partner, or named beneficiary having an insurable interest in the life of the member.

ACERA provides an annual cost-of-living benefit to all retirees. The cost-of-living adjustment, based upon the Consumer Price Index for the San Francisco-Oakland-Hayward Area[4] (with 1982-84 as the base period), is capped at 3.0% for General Tiers 1 and 3 and Safety Tier 1, and at 2.0% for General Tiers 2 and 4 and Safety Tiers 2, 2C, 2D, and 4.

The County of Alameda and the other participating agencies contribute to the retirement plan based upon actuarially determined contribution rates adopted by the Board of Retirement. Employer contribution rates are adopted annually based upon recommendations received from ACERA's actuary after the completion of the annual actuarial valuation. The average employer contribution rate as of December 31, 2018 for 2018 (based on the December 31, 2016 valuation for the second half of 2017/2018 and on the December 31, 2017 valuation for the first half of 2018/2019) was 25.78% of compensation.

Members are required to make contributions to ACERA regardless of the retirement plan or tier in which they are included. The average member contribution rate as of December 31, 2018 for 2018 (based on the December 31, 2016 valuation for the second half of 2017/2018 and on the December 31, 2017 valuation for the first half of 2018/2019) was 9.06% of compensation.

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[4] *Formerly the San Francisco-Oakland-San Jose Area.*

EXHIBIT 2

Net Pension Liability

Reporting Date for Employer under GASB 68 **Measurement Date for Employer under GASB 68**	**June 30, 2019** **December 31, 2018**	**June 30, 2018** **December 31, 2017**
The components of the Net Pension Liability are as follows:		
Total Pension Liability	$9,535,148,109	$9,123,899,264
Plan's Fiduciary Net Position	6,771,146,134	7,110,223,325
Net Pension Liability	$2,764,001,975	$2,013,675,939
Plan's Fiduciary Net Position as a percentage of the Total Pension Liability	71.01%	77.93%

The Net Pension Liability was measured as of December 31, 2018 and 2017. The Plan's Fiduciary Net Position (plan assets) was valued as of the measurement date while the Total Pension Liability was determined based upon rolling forward the Total Pension Liability from actuarial valuations as of December 31, 2017 and 2016, respectively.

Plan provisions. The plan provisions used in the measurement of the Net Pension Liability as of December 31, 2018 and December 31, 2017 are the same as those used in ACERA's funding valuations as of December 31, 2017 and December 31, 2016, respectively.

Actuarial assumptions. The Total Pension Liabilities as of December 31, 2018 and December 31, 2017 were determined by actuarial valuations as of December 31, 2017 and December 31, 2016, respectively. The actuarial assumptions used to develop the December 31, 2018 and December 31, 2017 TPLs are the same assumptions used in the December 31, 2018 and December 31, 2017 funding valuations for ACERA, respectively. In particular, the following actuarial assumptions were applied to all periods included in the measurement:

Inflation	3.00%
Salary increases	General: 8.30% to 3.90% and Safety: 11.30% to 4.30%, vary by service, including inflation
Investment rate of return	7.25%, net of pension plan investment expense, including inflation
Other assumptions	See analysis of actuarial experience during the period December 1, 2013 through November 30, 2016

EXHIBIT 3

Target Asset Allocation

The long-term expected rate of return on pension plan investments[5] was determined in 2017 using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. The returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation and subtracting expected investment expenses and a risk margin. The target allocation and projected arithmetic real rates of return for each major asset class, after deducting inflation, but before deducting investment expenses, are summarized in the following table. These values were used in the derivation of the long-term expected investment rate of return assumption for the December 31, 2018 valuation. This information is subject to change every three years based on the actuarial experience study.

Asset Class	Target Allocation	Long-Term (Arithmetic) Expected Real Rate of Return
Domestic Large Cap Equity	22.40%	5.75%
Domestic Small Cap Equity	5.60%	6.37%
Developed International Equity	19.50%	6.89%
Emerging Markets Equity	6.50%	9.54%
U.S. Core Fixed Income	11.25%	1.03%
High Yield Bonds	1.50%	3.99%
International Bonds	2.25%	0.19%
TIPS	2.00%	0.98%
Real Estate	8.00%	4.47%
Commodities	3.00%	3.78%
Hedge Funds	9.00%	4.30%
Private Equity	9.00%	7.60%
Total	100.00%	

[5] *Note that the investment return assumption for funding purposes was developed net of both investment and administrative expenses; however, the same investment return assumption was used for financial reporting purposes, and it was considered gross of administrative expenses for financial reporting purposes. (This resulted in an increase in the margin for adverse deviation when using that investment return assumption for financial reporting.)*

***Discount rate**:* The discount rate used to measure the Total Pension Liability was 7.25% as of December 31, 2018 and December 31, 2017. Our understanding is that Article 5.5 of the Statute, which authorizes the allocation of 50% of excess earnings to the SRBR, does not allow for the use of a different investment return assumption for funding than is used for interest crediting. In order to reflect the provisions of Article 5.5, we have treated future allocations to the SRBR as an additional outflow against the Plan's Fiduciary Net Position in the GASB crossover test, as mentioned earlier in Section 1. Again, we are estimating that the additional outflow would average approximately 0.60% of assets over time, based on the results of our stochastic modeling of the 50% allocation of future excess earnings to the SRBR.

The projection of cash flows used to determine the discount rate assumes plan member contributions will be made at the current member contribution rates, and that employer contributions will be made at rates equal to the actuarially determined contribution rates[6] plus additional future contributions that would follow from the future allocation of excess earnings to the SRBR. Projected employer contributions that are intended to fund the service costs for future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the pension plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability as of both December 31, 2018 and December 31, 2017.

[6] *For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included.*

EXHIBIT 4

Discount Rate Sensitivity

Sensitivity of the Net Pension Liability to changes in the discount rate. The following presents the Net Pension Liability of ACERA as of December 31, 2018, which is allocated to all employers, calculated using the discount rate of 7.25%, as well as what ACERA's Net Pension Liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.25%) or 1-percentage-point higher (8.25%) than the current rate. The determination of the NPL by employer is shown later in Exhibit 7.

	Net Pension Liability		
Employer	**1% Decrease (6.25%)**	**Current Discount Rate (7.25%)**	**1% Increase (8.25%)**
Alameda County	$3,048,047,067	$2,125,856,592	$1,366,656,089
Health System	754,512,490	501,587,358	292,273,001
Superior Court	145,826,765	96,943,208	56,488,430
First 5	15,236,683	10,129,093	5,902,184
Housing Authority	18,073,113	12,014,705	7,000,922
LARPD	23,065,103	15,804,862	9,949,630
ACOE	2,078,500	1,666,157	1,308,569
Total for all Employers	$4,006,839,721	$2,764,001,975	$1,739,578,825

EXHIBIT 5

Schedule of Changes in Net Pension Liability – Last Two Plan Years

Reporting Date for Employer under GASB 68 **Measurement Date for Employer under GASB 68**	**June 30, 2019** **December 31, 2018**	**June 30, 2018** **December 31, 2017**
Total Pension Liability		
1. Service cost	$209,890,150	$187,408,672
2. Interest	659,591,792	636,556,488
3. Change of benefit terms	0	0
4. Differences between expected and actual experience	13,710,084	17,516,316
5. Changes of assumptions	0	316,727,508
6. Benefit payments, including refunds of member contributions	-471,943,181	-445,288,615
7. Net change in Total Pension Liability	$411,248,845	$712,920,369
8. Total Pension Liability – beginning	9,123,899,264	8,410,978,895
9. Total Pension Liability – ending	$9,535,148,109	$9,123,899,264
Plan's Fiduciary Net Position		
10. Contributions – employer[1]	$269,684,809	$247,063,550
11. Contributions – employee	94,735,673	89,325,824
12. Net investment income	-216,308,362	1,065,909,076
13. Benefit payments, including refunds of member contributions	-471,943,181	-445,288,615
14. Administrative expense	-15,246,130	-14,571,178
15. Other	0	0
16. Net change in Plan's Fiduciary Net Position	-$339,077,191	$942,438,657
17. Plan's Fiduciary Net Position[2] – beginning	7,110,223,325	6,167,784,668
18. Plan's Fiduciary Net Position[2] – ending	$6,771,146,134	$7,110,223,325
19. Net Pension Liability – ending (9) – (18)	$2,764,001,975	$2,013,675,939
20. Plan's Fiduciary Net Position as a percentage of the Total Pension Liability	71.01%	77.93%
21. Covered payroll[3]	$1,046,033,851	$995,178,209
22. Plan Net Pension Liability as percentage of covered payroll	264.24%	202.34%

(1) Employer contributions are on a net basis after (i) considering the total cash contributions made by the employers, (ii) reducing by the employer contributions made to the 401(h) account, and (iii) increasing by the amount of transfer from the SRBR to the Employers Advance Reserve for employer contributions made to the 401(h) account in (ii).

(2) See footnote (4) on page v for a discussion on the development of the 12/31/2018 measurement date "Plan's Fiduciary Net Position – beginning" amount of $7,110,223,325 and the 12/31/2018 measurement date "Plan's Fiduciary Net Position – ending" amount of $6,771,146,134.

(3) Covered payroll represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based.

EXHIBIT 6

Schedule of Employer Contributions – Last Ten Plan Years

Plan Year Ended December 31	Actuarially Determined Contributions	Contributions in Relation to the Actuarially Determined Contributions	Contribution Deficiency (Excess)	Covered Payroll[1]	Contributions as a Percentage of Covered Payroll
2009	$132,198,602	$132,198,602	$0	$838,141,323	15.77%
2010	147,543,301	147,543,301	0	839,617,361	17.57%
2011	162,879,221	162,879,221	0	837,482,162	19.45%
2012	179,648,812	179,648,812	0	845,932,592	21.24%
2013	191,180,146	191,180,146	0	853,349,657	22.40%
2014	213,254,775	213,254,775	0	886,924,862	24.04%
2015	224,607,104	224,607,104	0	945,858,017[2]	23.75%
2016	241,728,451	241,728,451	0	947,567,631	25.51%
2017	247,063,550	247,063,550	0	995,178,209	24.83%
2018	269,684,809	269,684,809	0	1,046,033,851	25.78%

(1) *For plan years ended December 31, 2017 and later, covered payroll represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For plan years ended before December 31, 2017, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

(2) *ACERA indicated that this amount is based on 27 pay periods for 2015.*

Notes to Exhibit 6

Methods and assumptions used to establish "actuarially determined contribution" (ADC) rates:	
Valuation date	Actuarially determined contribution rates for the first six months of calendar year 2018 (or the second half of fiscal year 2017/2018) are calculated based on the December 31, 2016 valuation. Actuarially determined contribution rates for the last six months of calendar year 2018 (or the first half of fiscal year 2018/2019) are calculated based on the December 31, 2017 valuation.
Actuarial cost method	Entry Age Actuarial Cost Method
Amortization method	Level percent of payroll (3.75% payroll growth assumed in the December 31, 2016 valuation, and 3.50% payroll growth assumed in the December 31, 2017 valuation)
Remaining amortization period	
December 31, 2016 valuation	Prior to January 1, 2012, the total UAAL was amortized on a 30-year decreasing period, with 21 years remaining as of December 31, 2011 (and 16 years remaining as of December 31, 2016). On or after January 1, 2012, any new UAAL resulting from plan amendments are amortized over separate decreasing 15-year periods; early retirement incentive programs (ERIPs) are amortized over separate decreasing 5-year periods; assumption and method changes are amortized over separate decreasing 20-year periods; and experience gains/losses are also amortized over separate decreasing 20-year periods.
December 31, 2017 valuation	Prior to January 1, 2012, the total UAAL was amortized on a 30-year decreasing period, with 21 years remaining as of December 31, 2011 (and 15 years remaining as of December 31, 2017). On or after January 1, 2012, any new UAAL resulting from plan amendments are amortized over separate decreasing 15-year periods; early retirement incentive programs (ERIPs) are amortized over separate decreasing 5-year periods; assumption and method changes are amortized over separate decreasing 20-year periods; and experience gains/losses are also amortized over separate decreasing 20-year periods.
Actuarial valuation method	The actuarial value of assets is determined by recognizing any difference between the actual and the expected market return over 10 six-month interest crediting periods. The actuarial value of assets is further adjusted, if necessary, to be within 40% of the market value of assets. The valuation value of assets is the actuarial value of assets reduced by the value of the non-valuation reserves.

Notes to Exhibit 6 (continued)

Actuarial assumptions:	**December 31, 2016 Valuation** (for first six months of 2018 ADC)	**December 31, 2017 Valuation** (for last six months of 2018 ADC)
Investment rate of return	7.60%, net of pension plan administrative and investment expense, including inflation	7.25%, net of pension plan administrative and investment expense, including inflation
Inflation rate	3.25%	3.00%
Real across-the-board salary increases	0.50%	0.50%
Projected salary increases	General: 7.45% to 4.15% and Safety: 10.45% to 4.45%, vary by service, including inflation	General: 8.30% and 3.90% and Safety: 11.30% to 4.30%, vary by service, including inflation
Cost of living adjustments	3.00% of retirement income for General Tiers 1 and 3, and Safety Tier 1; 2.00% for General Tiers 2 and 4, and Safety Tiers 2, 2C, 2D, and 4	3.00% of retirement income for General Tiers 1 and 3, and Safety Tier 1; 2.00% for General Tiers 2 and 4, and Safety Tiers 2, 2C, 2D, and 4
Other assumptions	Same as those used in the December 31, 2016 funding actuarial valuation	Same as those used in the December 31, 2017 funding actuarial valuation

EXHIBIT 7

Determination of Proportionate Share

Actual Employer Contributions by Employer and Membership Class
January 1, 2017 to December 31, 2017

	General Members, Excluding LARPD Tier 3 and Tier 4		General LARPD Tier 3 and Tier 4 Members Only		All General Members Combined	
Employer	Contributions	Percentage[1]	Contributions	Percentage	Contributions	Percentage
Alameda County	$102,195,576	63.903%	$0	0.000%	$102,195,576	63.563%
Health System	46,206,829	28.893%	0	0.000%	46,206,829	28.740%
Superior Court	9,297,985	5.814%	0	0.000%	9,297,985	5.783%
First 5	910,867	0.570%	0	0.000%	910,867	0.567%
Housing Authority	1,115,522	0.698%	0	0.000%	1,115,522	0.694%
LARPD	195,892	0.122%	853,951	100.000%	1,049,843	0.653%
ACOE	0	0.000%	0	0.000%	0	0.000%
Total for all Employers	$159,922,671	100.000%	$853,951	100.000%	$160,776,622	100.000%

Actual Employer Contributions by Employer and Membership Class
January 1, 2017 to December 31, 2017

	Safety Members		Total	
Employer	Contributions	Percentage	Contributions	Percentage[1], [2]
Alameda County	$86,286,928	100.000%	$188,482,504	76.289%
Health System	0	0.000%	46,206,829	18.702%
Superior Court	0	0.000%	9,297,985	3.763%
First 5	0	0.000%	910,867	0.369%
Housing Authority	0	0.000%	1,115,522	0.452%
LARPD	0	0.000%	1,049,843	0.425%
ACOE	0	0.000%	0	0.000%
Total for all Employers	$86,286,928	100.000%	$247,063,550	100.000%

[1] *The unrounded percentages are used in the allocation of the NPL amongst the employers.*

[2] *Consistent with the practice we have been following since the inception of the implementation of GASB 67 and 68, we have used the unrounded percentages above in estimating the allocation of member contributions for purposes of determining pension expense amongst the employers. We have continued that practice through December 31, 2017 even though ACERA has since provided us with the actual member contributions by employer, as the difference between the actual and the estimated member contributions would only have the primary impact of changing the timing on when pension expense would have to be recognized by individual employers.*

EXHIBIT 7 (continued)

Determination of Proportionate Share

	Allocation of December 31, 2017 Net Pension Liability					
	General NPL, Excluding LARPD Tier 3 and Tier 4 (Excl. non-OPEB SRBR NPL)		General LARPD Tier 3 and Tier 4 NPL Only (Excl. non-OPEB SRBR NPL)		Total General NPL (Excl. non-OPEB SRBR NPL)	
Employer	**NPL**	**Percentage(1)**	**NPL**	**Percentage(1)**	**NPL**	**Percentage**
Alameda County	$711,665,897	63.903%	$0	0.000%	$711,665,897	63.594%
Health System	321,773,463	28.893%	0	0.000%	321,773,463	28.753%
Superior Court	64,748,975	5.814%	0	0.000%	64,748,975	5.786%
First 5	6,343,063	0.570%	0	0.000%	6,343,063	0.567%
Housing Authority	7,768,232	0.698%	0	0.000%	7,768,232	0.694%
LARPD	1,364,146	0.122%	5,415,907	100.000%	6,780,053	0.606%
ACOE	0	0.000%	0	0.000%	0	0.000%
Total for all Employers	$1,113,663,776	100.000%	$5,415,907	100.000%	$1,119,079,683	100.000%

	Allocation of December 31, 2017 Net Pension Liability					
	Safety NPL (Excl. non-OPEB SRBR NPL)		General & Safety Non-OPEB SRBR NPL		Total	
Employer	**NPL**	**Percentage(1)**	**NPL**	**Percentage(2)**	**NPL**	**Percentage**
Alameda County	$789,111,330	100.000%	$80,473,478	76.289%	$1,581,250,705	78.526%
Health System	0	0.000%	19,728,219	18.702%	341,501,682	16.959%
Superior Court	0	0.000%	3,969,818	3.763%	68,718,793	3.413%
First 5	0	0.000%	388,899	0.369%	6,731,962	0.334%
Housing Authority	0	0.000%	476,277	0.452%	8,244,509	0.409%
LARPD	0	0.000%	448,235	0.425%	7,228,288	0.359%
ACOE	0	0.000%	0	0.000%	0	0.000%
Total for all Employers	$789,111,330	100.000%	$105,484,926	100.000%	$2,013,675,939	100.000%

(1) *Allocated based on the actual employer contributions within each membership class.*
(2) *Allocated based on the actual employer contributions in total.*

EXHIBIT 7 (continued)

Determination of Proportionate Share

Notes:

Based on the January 1, 2017 through December 31, 2017 employer contributions as provided by ACERA.

Pension (excluding non-OPEB SRBR)

The Net Pension Liability (NPL) for each membership class is the Total Pension Liability (TPL) minus the Plan's Fiduciary Net Position (plan assets). The Total Pension Liability for each membership class is obtained from internal valuation results. The Plan's Fiduciary Net Position for each membership class is obtained by allocating the total Plan's Fiduciary Net Position for Pension (excluding non-OPEB SRBR) proportionally based on the valuation value of assets (VVA) for each membership class relative to the total valuation value of assets for all membership classes.[3] The total Plan's Fiduciary Net Position for pension as of December 31, 2017 includes the net market value of assets less SRBR assets. The SRBR assets include the SRBR-OPEB reserve (after reducing the reserve by the SRBR implicit subsidy transfer), the 401(h) reserve, and the Non-OPEB SRBR reserve, plus a proportionate share of one half of the deferred market gains (after adjustment to include the balance in the Contingency Reserve) commensurate with the size of those SRBR reserves.

The General LARPD Tier 3 and Tier 4 membership class has only one employer (LARPD), so all of the NPL for General LARPD Tier 3 and Tier 4 is allocated to LARPD. The Safety membership class also has only one employer (County), so all of the NPL for Safety is allocated to the County.

For General excluding LARPD Tier 3 and Tier 4, the NPL is allocated based on the actual employer contributions within the General non-LARPD Tier 3 and Tier 4 membership class. The steps used for the allocation are as follows:

-First calculate the ratio of the employer's contributions to the total contributions for the membership class.
-This ratio is multiplied by the NPL for the membership class to determine the employer's proportionate share of the NPL for the membership class.

Non-OPEB SRBR

For non-OPEB SRBR, the NPL is allocated based on the actual employer contributions in total. The steps used for the allocation are as follows:

-First calculate the ratio of the employer's total contributions to the total contributions for all employers.
-This ratio is multiplied by the NPL for the non-OPEB SRBR to determine the employer's proportionate share of the NPL for the non-OPEB SRBR.

Total

The employer's total allocated NPL is the sum of its allocated pension NPL from each membership class and the non-OPEB SRBR. The proportionate share of the total plan NPL is then the ratio of the employer's total allocated NPL to the total NPL of all employers.

[3] *As of December 31, 2017, the total Plan's Fiduciary Net Position for Pension (excluding non-OPEB SRBR) is $236.0 million* ***higher*** *than the valuation value of assets as of the same date due to the inclusion of deferred market* ***gains*** *and a non-zero Contingency Reserve.*

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Employer Contributions by Employer and Membership Class
January 1, 2018 to December 31, 2018

	General Members, Excluding ACOE and LARPD		General ACOE Members Only		General LARPD Members Only		All General Members Combined	
Employer	**Contributions**	**Percentage[1]**	**Contributions**	**Percentage**	**Contributions**	**Percentage**	**Contributions**	**Percentage**
Alameda County	$112,075,994	64.134%	$0	N/A	$0	0.000%	$112,075,994	63.731%
Health System	50,652,924	28.985%	0	N/A	0	0.000%	50,652,924	28.804%
Superior Court	9,789,834	5.602%	0	N/A	0	0.000%	9,789,834	5.567%
First 5	1,022,889	0.585%	0	N/A	0	0.000%	1,022,889	0.582%
Housing Authority	1,213,308	0.694%	0	N/A	0	0.000%	1,213,308	0.690%
LARPD	0	0.000%	0	N/A	1,100,236	100.000%	1,100,236	0.626%
ACOE	0	0.000%	0	N/A	0	0.000%	0	0.000%
Total for all Employers	$174,754,949	100.000%	$0	N/A	$1,100,236	100.000%	$175,855,185	100.000%

Actual Employer Contributions by Employer and Membership Class
January 1, 2018 to December 31, 2018

	Safety Members		Total	
Employer	**Contributions**	**Percentage**	**Contributions**	**Percentage[1], [2]**
Alameda County	$93,829,624	100.000%	$205,905,618	76.351%
Health System	0	0.000%	50,652,924	18.782%
Superior Court	0	0.000%	9,789,834	3.630%
First 5	0	0.000%	1,022,889	0.379%
Housing Authority	0	0.000%	1,213,308	0.450%
LARPD	0	0.000%	1,100,236	0.408%
ACOE	0	0.000%	0	0.000%
Total for all Employers	$93,829,624	100.000%	$269,684,809	100.000%

[1] *The unrounded percentages are used in the allocation of the NPL amongst the employers.*

[2] *In prior years, we used the unrounded percentages above in estimating the allocation of member contributions for purposes of determining pension expense amongst the employers. We had continued that practice through December 31, 2017 even though ACERA has since provided us with the actual member contributions by employer, as the difference between the actual and the estimated member contributions would only have the primary impact of changing the timing on when pension expense would have to be recognized by individual employers.*

Starting with the 12/31/2018 actuarial valuation, ACERA has provided us with actual Pension Plan benefit payments by General (excluding ACOE and LARPD), General ACOE, General LARPD and Safety membership classes (in addition to the actual member contributions by employers). Therefore, we now use the actual Pension Plan benefit payments by those four membership classes and actual member contributions by employer within each of the four membership classes for purposes of determining pension expense amongst the employers. This is consistent with how we developed the valuation value of assets in the funding actuarial valuation.

EXHIBIT 7 (continued)

Determination of Proportionate Share

	Allocation of December 31, 2018 Net Pension Liability							
	General NPL, Excluding ACOE and LARPD (Excl. non-OPEB SRBR NPL)		General ACOE NPL Only (Excl. non-OPEB SRBR NPL)		General LARPD NPL Only (Excl. non-OPEB SRBR NPL)		Total General NPL (Excl. non-OPEB SRBR NPL)	
Employer	NPL	Percentage[1]	NPL	Percentage[1]	NPL	Percentage[1]	NPL	Percentage
Alameda County	$1,056,842,788	64.134%	$0	0.000%	$0	0.000%	$1,056,842,788	63.481%
Health System	477,641,781	28.985%	0	0.000%	0	0.000%	477,641,781	28.690%
Superior Court	92,315,179	5.602%	0	0.000%	0	0.000%	92,315,179	5.545%
First 5	9,645,534	0.585%	0	0.000%	0	0.000%	9,645,534	0.579%
Housing Authority	11,441,128	0.694%	0	0.000%	0	0.000%	11,441,128	0.687%
LARPD	0	0.000%	0	0.000%	15,284,738	100.000%	15,284,738	0.918%
ACOE	0	0.000%	1,666,157	100.000%	0	0.000%	1,666,157	0.100%
Total for all Employers	$1,647,886,410	100.000%	$1,666,157	100.000%	$15,284,738	100.000%	$1,664,837,305	100.000%

	Allocation of December 31, 2018 Net Pension Liability							
	Safety NPL (Excl. non-OPEB SRBR NPL)		General & Safety Total (Excl. non-OPEB SRBR NPL)		General & Safety Non-OPEB SRBR NPL		Total	
Employer	NPL	Percentage[1]	NPL	Percentage	NPL	Percentage[2]	NPL	Percentage
Alameda County	$971,674,335	100.000%	$2,028,517,123	76.940%	$97,339,469	76.351%	$2,125,856,592	76.913%
Health System	0	0.000%	477,641,781	18.116%	23,945,577	18.782%	501,587,358	18.147%
Superior Court	0	0.000%	92,315,179	3.501%	4,628,029	3.630%	96,943,208	3.507%
First 5	0	0.000%	9,645,534	0.366%	483,559	0.379%	10,129,093	0.366%
Housing Authority	0	0.000%	11,441,128	0.434%	573,577	0.450%	12,014,705	0.435%
LARPD	0	0.000%	15,284,738	0.580%	520,124	0.408%	15,804,862	0.572%
ACOE	0	0.000%	1,666,157	0.063%	0	0.000%	1,666,157	0.060%
Total for all Employers	$971,674,335	100.000%	$2,636,511,640	100.000%	$127,490,335	100.000%	$2,764,001,975	100.000%

(1) *Allocated based on the actual employer contributions within each membership class.*

(2) *Allocated based on the actual employer contributions in total. ACOE was not required to make any Pension Plan contributions during 2018 because their payroll was $0. However, they were required to make a contribution under the Declining Employer Payroll Policy starting in 2019. As they would be expected to make a large lump sum contribution to partially pay off their liability, we would consult with the auditor on whether any special adjustment needs to be made when we report their non-OPEB SRBR NPL next year.*

EXHIBIT 7 (continued)

Determination of Proportionate Share

Notes:

Based on the January 1, 2018 through December 31, 2018 employer contributions as provided by ACERA.

Pension (excluding non-OPEB SRBR)

The Net Pension Liability (NPL) for each membership class is the Total Pension Liability (TPL) minus the Plan's Fiduciary Net Position (plan assets). The Total Pension Liability for each membership class is obtained from internal valuation results. The Plan's Fiduciary Net Position for each membership class is obtained by allocating the total Plan's Fiduciary Net Position for Pension (excluding non-OPEB SRBR) proportionally based on the valuation value of assets for each membership class relative to the total valuation value of assets for all membership classes.(3) The total Plan's Fiduciary Net Position for pension as of December 31, 2018 includes the net market value of assets less SRBR assets. The SRBR assets include the SRBR-OPEB reserve (after reducing the reserve by the SRBR implicit subsidy transfer), the 401(h) reserve, and the Non-OPEB SRBR reserve, less a proportionate share of the deferred market losses (after adjustment to include the balance in the Contingency Reserve) commensurate with the size of those SRBR reserves.

The General ACOE membership class has only one employer (ACOE), so all of the NPL for General ACOE is allocated to the ACOE. The General LARPD membership class has only one employer (LARPD), so all of the NPL for General LARPD is allocated to LARPD. The Safety membership class also has only one employer (County), so all of the NPL for Safety is allocated to the County.

For General excluding ACOE and LARPD, the NPL is allocated based on the actual employer contributions within the General membership class excluding any contributions made by ACOE and LARPD. The steps used for the allocation are as follows:

-First calculate the ratio of the employer's contributions to the total contributions for the membership class.
-This ratio is multiplied by the NPL for the membership class to determine the employer's proportionate share of the NPL for the membership class.

Non-OPEB SRBR

For non-OPEB SRBR, the NPL is allocated based on the actual employer contributions in total. The steps used for the allocation are as follows:

-First calculate the ratio of the employer's total contributions to the total contributions for all employers.
-This ratio is multiplied by the NPL for the non-OPEB SRBR to determine the employer's proportionate share of the NPL for the non-OPEB SRBR.

Total

The employer's total allocated NPL is the sum of its allocated pension NPL from each membership class and the non-OPEB SRBR. The proportionate share of the total plan NPL is then the ratio of the employer's total allocated NPL to the total NPL of all employers.

(3) *As of December 31, 2018, the total Plan's Fiduciary Net Position for Pension (excluding non-OPEB SRBR) is $504.8 million* ***lower*** *than the valuation value of assets as of the same date due to the inclusion of deferred market* ***losses*** *and no available Contingency Reserve.*

EXHIBIT 7 (continued)
Determination of Proportionate Share

Notes (continued):

For purposes of the above results, the reporting date for the employer under GASB 68 is June 30, 2019. The reporting date and the measurement date for the plan under GASB 67 are December 31, 2018. Consistent with the provisions of GASB 68, the assets and liabilities measured as of December 31, 2018 are not adjusted or "rolled forward" to the June 30, 2019 reporting date. Other results, such as the total deferred inflows and outflows, would also be allocated based on the same proportionate share determined above.

The following items are allocated based on the corresponding proportionate share within each membership class:

- 1) Net Pension Liability
- 2) Service cost
- 3) Interest on the Total Pension Liability
- 4) Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability
- 5) Expensed portion of current-period changes of assumptions or other inputs
- 6) Member contributions
- 7) Projected earnings on plan investments
- 8) Expensed portion of current-period differences between actual and projected earnings on plan investments
- 9) Administrative expense
- 10) Recognition of beginning of year deferred outflows of resources as pension expense
- 11) Recognition of beginning of year deferred inflows of resources as pension expense

EXHIBIT 8

Pension Expense – Total for all Employers

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Components of Pension Expense		
1. Service cost	$209,890,150	$187,408,672
2. Interest on the Total Pension Liability	659,591,792	636,556,488
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	2,524,878	3,202,252
6. Expensed portion of current-period changes of assumptions or other inputs	0	57,902,653
7. Member contributions	-94,735,673	-89,325,824
8. Projected earnings on plan investments	-511,040,821	-464,059,759
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	145,469,836	-120,369,864
10. Administrative expense	15,246,130	14,571,178
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	282,332,350	210,003,910
13. Recognition of beginning of year deferred inflows of resources as pension expense	-164,493,292	-32,899,895
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
Pension Expense	$544,785,350	$402,989,811

EXHIBIT 8 (continued)

Pension Expense – Alameda County

		June 30, 2019	June 30, 2018
Reporting Date for Employer under GASB 68		**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 68		**December 31, 2018**	**December 31, 2017**
Components of Pension Expense			
1.	Service cost	$154,855,811	$137,733,213
2.	Interest on the Total Pension Liability	486,567,087	468,582,736
3.	Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	320,097	-1,732,979
4.	Expensed portion of current-period benefit changes	0	0
5.	Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	1,632,110	3,061,991
6.	Expensed portion of current-period changes of assumptions or other inputs	0	44,115,603
7.	Member contributions	-69,722,923	-68,145,847
8.	Projected earnings on plan investments	-370,163,258	-335,954,653
9.	Expensed portion of current-period differences between actual and projected earnings on plan investments	105,461,873	-86,299,823
10.	Administrative expense	11,050,528	10,536,240
11.	Other	0	0
12.	Recognition of beginning of year deferred outflows of resources as pension expense	211,362,379	155,375,587
13.	Recognition of beginning of year deferred inflows of resources as pension expense	-117,684,655	-22,672,747
14.	Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	-760,647	972,332
Pension Expense		$412,918,402	$305,571,653

EXHIBIT 8 (continued)

Pension Expense – Health System

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Components of Pension Expense		
1. Service cost	$43,656,653	$38,985,086
2. Interest on the Total Pension Liability	136,626,835	132,550,644
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	125,393	2,390,097
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-112,331	71,457
6. Expensed portion of current-period changes of assumptions or other inputs	0	10,868,136
7. Member contributions	-19,812,901	-16,706,079
8. Projected earnings on plan investments	-111,084,921	-101,072,911
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	31,584,268	-26,826,375
10. Administrative expense	3,329,437	3,184,036
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	56,444,009	43,251,307
13. Recognition of beginning of year deferred inflows of resources as pension expense	-36,820,885	-7,786,202
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	1,896,660	-493,437
Pension Expense	$105,832,217	$78,415,759

EXHIBIT 8 (continued)

Pension Expense – Superior Court

Reporting Date for Employer under GASB 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Components of Pension Expense		
1. Service cost	$8,437,645	$7,844,787
2. Interest on the Total Pension Liability	26,406,255	26,672,548
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	-467,238	-531,672
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-21,711	14,379
6. Expensed portion of current-period changes of assumptions or other inputs	0	2,186,945
7. Member contributions	-3,829,296	-3,361,686
8. Projected earnings on plan investments	-21,469,697	-20,338,431
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	6,104,380	-5,398,147
10. Administrative expense	643,490	640,709
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	10,909,094	8,703,259
13. Recognition of beginning of year deferred inflows of resources as pension expense	-7,116,477	-1,566,781
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	-976,414	-444,742
Pension Expense	$18,620,031	$14,421,168

EXHIBIT 8 (continued)

Pension Expense – First 5

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Components of Pension Expense		
1. Service cost	$881,606	$768,506
2. Interest on the Total Pension Liability	2,759,053	2,612,947
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	32,275	-6,936
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-2,268	1,409
6. Expensed portion of current-period changes of assumptions or other inputs	0	214,241
7. Member contributions	-400,103	-329,324
8. Projected earnings on plan investments	-2,243,258	-1,992,432
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	637,815	-528,824
10. Administrative expense	67,235	62,766
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	1,139,834	852,605
13. Recognition of beginning of year deferred inflows of resources as pension expense	-743,563	-153,488
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	-7,552	-616
Pension Expense	$2,121,074	$1,500,854

EXHIBIT 8 (continued)

Pension Expense – Housing Authority

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Components of Pension Expense		
1. Service cost	$1,045,723	$941,175
2. Interest on the Total Pension Liability	3,272,673	3,200,028
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	-8,649	-73,767
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	-2,690	1,726
6. Expensed portion of current-period changes of assumptions or other inputs	0	262,377
7. Member contributions	-474,586	-403,317
8. Projected earnings on plan investments	-2,660,858	-2,440,095
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	756,549	-647,640
10. Administrative expense	79,751	76,869
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	1,352,024	1,044,170
13. Recognition of beginning of year deferred inflows of resources as pension expense	-881,984	-187,974
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	-103,402	-29,635
Pension Expense	$2,374,551	$1,743,917

EXHIBIT 8 (continued)

Pension Expense – LARPD

Reporting Date for Employer under GASB 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Components of Pension Expense		
1. Service cost	$1,012,712	$1,135,905
2. Interest on the Total Pension Liability	3,726,119	2,937,585
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	-1,878	-17,954
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	786,419	51,290
6. Expensed portion of current-period changes of assumptions or other inputs	0	255,351
7. Member contributions	-495,864	-379,571
8. Projected earnings on plan investments	-3,185,059	-2,261,237
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	858,169	-669,055
10. Administrative expense	75,689	70,558
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	1,125,010	776,982
13. Recognition of beginning of year deferred inflows of resources as pension expense	-1,245,728	-532,703
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	-23,020	-5,066
Pension Expense	$2,632,569	$1,362,085

EXHIBIT 8 (continued)

Pension Expense – ACOE

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Components of Pension Expense		
1. Service cost	$0	$0
2. Interest on the Total Pension Liability	233,770	0
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	0	-26,789
4. Expensed portion of current-period benefit changes	0	0
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	245,349	0
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions	0	0
8. Projected earnings on plan investments	-233,770	0
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	66,782	0
10. Administrative expense	0	0
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as pension expense	0	0
13. Recognition of beginning of year deferred inflows of resources as pension expense	0	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	-25,625	1,164
Pension Expense	$286,506	-$25,625

EXHIBIT 9

Deferred Outflows of Resources and Deferred Inflows of Resources – Total for all Employers

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$11,749,924	$13,141,896
2. Changes of assumptions or other inputs	360,441,014	532,193,138
3. Net excess of projected over actual earnings on pension plan investments (if any)	306,808,831	0
4. Differences between expected and actual experience in the Total Pension Liability	25,255,560	15,715,856
5. Total deferred outflows of resources	$704,255,329	$561,050,890
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$11,749,924	$13,141,896
7. Changes of assumptions or other inputs	37,859,697	48,770,272
8. Net excess of actual over projected earnings on pension plan investments (if any)	0	288,402,054
9. Differences between expected and actual experience in the Total Pension Liability	54,127,688	85,444,143
10. Total deferred inflows of resources	$103,737,309	$435,758,365

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GASB 68, Year Ended June 30:		
2019	N/A	$117,839,058
2020	$221,916,683	73,921,969
2021	103,232,456	-44,762,258
2022	97,569,171	-50,425,543
2023	176,714,016	28,719,299
2024	1,085,694	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GASB 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – Alameda County

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$2,466,421	$2,020,723
2. Changes of assumptions or other inputs	273,034,940	400,610,165
3. Net excess of projected over actual earnings on pension plan investments (if any)	227,497,573	0
4. Differences between expected and actual experience in the Total Pension Liability	19,752,967	14,582,897
5. Total deferred outflows of resources	$522,751,901	$417,213,785
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$6,013,423	$7,746,402
7. Changes of assumptions or other inputs	28,906,056	37,206,390
8. Net excess of actual over projected earnings on pension plan investments (if any)	0	200,415,342
9. Differences between expected and actual experience in the Total Pension Liability	36,780,980	58,387,312
10. Total deferred inflows of resources	$71,700,459	$303,755,446

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GASB 68, Year Ended June 30:		
2019	N/A	$92,819,969
2020	$167,477,086	60,013,165
2021	79,881,492	-27,450,303
2022	74,051,658	-33,283,473
2023	128,801,761	21,358,981
2024	839,445	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GASB 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – Health System

Reporting Date for Employer under GASB 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$8,849,129	$10,683,734
2. Changes of assumptions or other inputs	69,408,590	103,899,231
3. Net excess of projected over actual earnings on pension plan investments (if any)	62,503,140	0
4. Differences between expected and actual experience in the Total Pension Liability	609,653	724,433
5. Total deferred outflows of resources	$141,370,512	$115,307,398
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$644,039	$1,137,476
7. Changes of assumptions or other inputs	7,110,910	9,121,214
8. Net excess of actual over projected earnings on pension plan investments (if any)	0	69,029,987
9. Differences between expected and actual experience in the Total Pension Liability	13,240,156	20,549,697
10. Total deferred inflows of resources	$20,995,105	$99,838,374

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GASB 68, Year Ended June 30:		
2019	N/A	$21,474,983
2020	$44,158,803	12,534,257
2021	19,151,874	-12,423,523
2022	19,188,842	-12,381,646
2023	37,870,269	6,264,953
2024	5,619	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GASB 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – Superior Court

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[(1)]	$64,308	$103,521
2. Changes of assumptions or other inputs	13,414,795	20,907,158
3. Net excess of projected over actual earnings on pension plan investments (if any)	12,080,159	0
4. Differences between expected and actual experience in the Total Pension Liability	117,829	145,774
5. Total deferred outflows of resources	$25,677,091	$21,156,453
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[(1)]	$4,469,239	$3,415,005
7. Changes of assumptions or other inputs	1,374,346	1,835,420
8. Net excess of actual over projected earnings on pension plan investments (if any)	0	13,890,583
9. Differences between expected and actual experience in the Total Pension Liability	2,558,963	4,135,120
10. Total deferred inflows of resources	$8,402,548	$23,276,128

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GASB 68, Year Ended June 30:		
2019	N/A	$2,963,240
2020	$6,803,729	1,267,065
2021	2,161,138	-3,566,339
2022	2,159,101	-3,568,372
2023	6,360,819	784,731
2024	-210,244	0
Thereafter	0	0

[(1)] *Calculated in accordance with Paragraphs 54 and 55 of GASB 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – First 5

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$253,455	$159,214
2. Changes of assumptions or other inputs	1,401,642	2,048,148
3. Net excess of projected over actual earnings on pension plan investments (if any)	1,262,193	0
4. Differences between expected and actual experience in the Total Pension Liability	12,311	14,281
5. Total deferred outflows of resources	$2,929,601	$2,221,643
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$57,626	$113,912
7. Changes of assumptions or other inputs	143,598	179,805
8. Net excess of actual over projected earnings on pension plan investments (if any)	0	1,360,776
9. Differences between expected and actual experience in the Total Pension Liability	267,373	405,092
10. Total deferred inflows of resources	$468,597	$2,059,585

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GASB 68, Year Ended June 30:		
2019	N/A	$378,394
2020	$889,984	216,529
2021	407,805	-252,537
2022	381,763	-278,423
2023	768,552	98,095
2024	12,900	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GASB 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – Housing Authority

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$80,751	$117,871
2. Changes of assumptions or other inputs	1,662,569	2,508,328
3. Net excess of projected over actual earnings on pension plan investments (if any)	1,497,161	0
4. Differences between expected and actual experience in the Total Pension Liability	14,603	17,489
5. Total deferred outflows of resources	$3,255,084	$2,643,688
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$339,684	$441,888
7. Changes of assumptions or other inputs	170,330	220,204
8. Net excess of actual over projected earnings on pension plan investments (if any)	0	1,666,517
9. Differences between expected and actual experience in the Total Pension Liability	317,147	496,109
10. Total deferred inflows of resources	$827,161	$2,824,718

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GASB 68, Year Ended June 30:		
2019	N/A	$369,257
2020	$916,918	173,049
2021	351,872	-395,570
2022	330,126	-417,220
2023	833,886	89,454
2024	-4,879	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GASB 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – LARPD

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$30,864	$49,685
2. Changes of assumptions or other inputs	1,518,478	2,220,108
3. Net excess of projected over actual earnings on pension plan investments (if any)	1,701,476	0
4. Differences between expected and actual experience in the Total Pension Liability	3,661,300	230,982
5. Total deferred outflows of resources	$6,912,118	$2,500,775
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$132,281	$165,804
7. Changes of assumptions or other inputs	154,457	207,239
8. Net excess of actual over projected earnings on pension plan investments (if any)	0	2,038,849
9. Differences between expected and actual experience in the Total Pension Liability	963,069	1,470,813
10. Total deferred inflows of resources	$1,249,807	$3,882,705

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GASB 68, Year Ended June 30:		
2019	N/A	-$141,160
2020	$1,383,342	-256,786
2021	991,004	-649,126
2022	1,171,424	-470,535
2023	1,779,189	135,677
2024	337,352	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GASB 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – ACOE

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$4,996	$7,148
2. Changes of assumptions or other inputs	0	0
3. Net excess of projected over actual earnings on pension plan investments (if any)	267,129	0
4. Differences between expected and actual experience in the Total Pension Liability	1,086,897	0
5. Total deferred outflows of resources	$1,359,022	$7,148
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$93,632	$121,409
7. Changes of assumptions or other inputs	0	0
8. Net excess of actual over projected earnings on pension plan investments (if any)	0	0
9. Differences between expected and actual experience in the Total Pension Liability	0	0
10. Total deferred inflows of resources	$93,632	$121,409

Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:

Reporting Date for Employer under GASB 68, Year Ended June 30:		
2019	N/A	-$25,625
2020	$286,821	-25,310
2021	287,271	-24,860
2022	286,257	-25,874
2023	299,540	-12,592
2024	105,501	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 54 and 55 of GASB 68.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources

There are changes in each employer's proportionate share of the total Net Pension Liability during the measurement period ended December 31, 2018. The net effect of the change on the employer's proportionate share of the collective Net Pension Liability and collective deferred outflows of resources and deferred inflows of resources is recognized over the average of the expected remaining service lives of all employees that are provided with pensions through ACERA, which is 5.43 years determined as of December 31, 2017 (the beginning of the measurement period ending December 31, 2018).

In addition, the difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ended December 31, 2018 is recognized over the same period.

The average of the expected service lives of all employees is determined by:

- Calculating each active employee's expected remaining service life as the present value of $1 per year of future service at zero percent interest.
- Setting the remaining service life to zero for each nonactive or retired member.
- Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

EXHIBIT 10

Schedule of Proportionate Share of the Net Pension Liability – Total for all Employers

Reporting Date for Employer under GASB 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	100.000%	$1,282,020,543	$853,349,657	150.23%	81.62%
2015	100.000%	$1,740,642,540	$886,924,862	196.26%	77.26%
2016	100.000%	$2,118,448,018	$945,858,017	223.97%	73.43%
2017	100.000%	$2,243,194,227	$947,567,631	236.73%	73.33%
2018	100.000%	$2,013,675,939	$995,178,209	202.34%	77.93%
2019	100.000%	$2,764,001,975	$1,046,033,851	264.24%	71.01%

(1) *For reporting dates on or after June 30, 2018, covered payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For reporting dates before June 30, 2018, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – Alameda County

Reporting Date for Employer under GASB 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	79.664%	$1,021,302,378	$597,886,511	170.82%	80.13%
2015	78.293%	$1,362,794,384	$624,890,234	218.09%	75.95%
2016	77.434%	$1,640,381,401	$669,324,559	245.08%	72.23%
2017	77.697%	$1,742,898,513	$670,675,915	259.87%	72.10%
2018	78.526%	$1,581,250,705	$696,359,743	227.07%	76.50%
2019	76.913%	$2,125,856,592	$728,698,264	291.73%	69.77%

[1] *For reporting dates on or after June 30, 2018, covered payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For reporting dates before June 30, 2018, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – Health System

Reporting Date for Employer under GASB 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	15.499%	$198,700,381	$197,865,572	100.42%	85.92%
2015	16.779%	$292,060,821	$205,303,352	142.26%	81.06%
2016	17.436%	$369,372,264	$217,863,121	169.54%	76.89%
2017	17.285%	$387,733,901	$216,685,931	178.94%	76.88%
2018	16.959%	$341,501,682	$239,207,087	142.76%	81.93%
2019	18.147%	$501,587,358	$255,247,270	196.51%	74.56%

(1) *For reporting dates on or after June 30, 2018, covered payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For reporting dates before June 30, 2018, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – Superior Court

Reporting Date for Employer under GASB 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[(1)]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	3.554%	$45,564,584	$45,426,844	100.30%	85.92%
2015	3.695%	$64,323,516	$44,783,132	143.63%	81.06%
2016	3.880%	$82,205,987	$45,883,436	179.16%	76.89%
2017	3.806%	$85,372,076	$46,866,752	182.16%	76.88%
2018	3.413%	$68,718,793	$46,437,348	147.98%	81.93%
2019	3.507%	$96,943,208	$48,293,563	200.74%	74.56%

(1) *For reporting dates on or after June 30, 2018, covered payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For reporting dates before June 30, 2018, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – First 5

Reporting Date for Employer under GASB 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.321%	$4,116,118	$4,191,989	98.19%	85.92%
2015	0.326%	$5,674,306	$3,957,401	143.38%	81.06%
2016	0.349%	$7,383,341	$4,239,645	174.15%	76.89%
2017	0.358%	$8,035,666	$4,416,769	181.94%	76.88%
2018	0.334%	$6,731,962	$4,562,701	147.54%	81.93%
2019	0.366%	$10,129,093	$4,952,333	204.53%	74.56%

(1) *For reporting dates on or after June 30, 2018, covered payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For reporting dates before June 30, 2018, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – Housing Authority

Reporting Date for Employer under GASB 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.423%	$5,418,947	$4,112,203	131.78%	85.92%
2015	0.428%	$7,455,335	$4,002,650	186.26%	81.06%
2016	0.455%	$9,644,104	$4,272,082	225.75%	76.89%
2017	0.460%	$10,314,924	$4,354,275	236.89%	76.88%
2018	0.409%	$8,244,509	$4,299,288	191.76%	81.93%
2019	0.435%	$12,014,705	$4,512,036	266.28%	74.56%

(1) *For reporting dates on or after June 30, 2018, covered payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For reporting dates before June 30, 2018, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – LARPD

Reporting Date for Employer under GASB 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.532%	$6,824,150	$3,796,820	179.73%	78.70%
2015	0.471%	$8,203,447	$3,919,778	209.28%	76.82%
2016	0.438%	$9,288,497	$4,203,012	221.00%	75.39%
2017	0.385%	$8,644,696	$4,487,952	192.62%	77.76%
2018	0.359%	$7,228,288	$4,312,042	167.63%	82.99%
2019	0.572%	$15,804,862	$4,330,385	364.98%	72.74%

(1) *For reporting dates on or after June 30, 2018, covered payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For reporting dates before June 30, 2018, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net Pension Liability – ACOE

Reporting Date for Employer under GASB 68 as of June 30	Proportion of the Net Pension Liability	Proportionate share of Net Pension Liability	Covered payroll[1]	Proportionate share of the Net Pension Liability as a percentage of its covered payroll	Plan's Fiduciary Net Position as a percentage of the Total Pension Liability
2014	0.007%	$93,985	$69,718	134.81%	85.92%
2015	0.008%	$130,731	$68,314	191.37%	81.06%
2016	0.008%	$172,424	$72,162	238.94%	76.89%
2017	0.009%	$194,451	$80,037	242.95%	76.88%
2018	0.000%	$0	$0	N/A	N/A
2019	0.060%	$1,666,157	$0	N/A	63.63%

(1) *For reporting dates on or after June 30, 2018, covered payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll on which contributions to the pension plan are based. For reporting dates before June 30, 2018, covered payroll was referred to as covered-employee payroll and only Compensation Earnable and Pensionable Compensation that would go into the determination of retirement benefits was included.*

EXHIBIT 11

Schedule of Reconciliation of Net Pension Liability – Total for all Employers

Reporting Date for Employer under GASB 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$2,013,675,939	$2,243,194,227
2. Pension Expense	544,785,350	402,989,811
3. Employer Contributions	-269,684,809	-247,063,550
4. New Net Deferred Inflows/Outflows	593,064,553	-208,340,534
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	0
6. New Net Deferred Flows Due to Change in Proportion	0	0
7. Recognition of Prior Deferred Inflows/Outflows	-117,839,058	-177,104,015
8. Recognition of Prior Deferred Flows Due to Change in Proportion	0	0
9. Ending Net Pension Liability	$2,764,001,975	$2,013,675,939

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – Alameda County

Reporting Date for Employer under GASB 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$1,581,250,705	$1,742,898,513
2. Pension Expense	412,918,402	305,571,653
3. Employer Contributions	-205,905,618	-188,482,504
4. New Net Deferred Inflows/Outflows	429,077,731	-134,315,445
5. Change in Allocation of Prior Deferred Inflows/Outflows	14,420	-2,999,935
6. New Net Deferred Flows Due to Change in Proportion	1,418,030	-7,746,402
7. Recognition of Prior Deferred Inflows/Outflows	-93,677,725	-132,702,843
8. Recognition of Prior Deferred Flows Due to Change in Proportion	760,647	-972,332
9. Ending Net Pension Liability	$2,125,856,592	$1,581,250,705

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – Health System

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	December 31, 2018	December 31, 2017
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$341,501,682	$387,733,901
2. Pension Expense	105,832,217	78,415,759
3. Employer Contributions	-50,652,924	-46,206,829
4. New Net Deferred Inflows/Outflows	125,839,447	-58,405,524
5. Change in Allocation of Prior Deferred Inflows/Outflows	31,227	4,252,308
6. New Net Deferred Flows Due to Change in Proportion	555,492	10,683,734
7. Recognition of Prior Deferred Inflows/Outflows	-19,623,123	-35,465,104
8. Recognition of Prior Deferred Flows Due to Change in Proportion	-1,896,660	493,437
9. Ending Net Pension Liability	$501,587,358	$341,501,682

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – Superior Court

Reporting Date for Employer under GASB 68	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$68,718,793	$85,372,076
2. Pension Expense	18,620,031	14,421,168
3. Employer Contributions	-9,789,834	-9,297,985
4. New Net Deferred Inflows/Outflows	24,321,347	-11,752,671
5. Change in Allocation of Prior Deferred Inflows/Outflows	-41,065	-955,481
6. New Net Deferred Flows Due to Change in Proportion	-2,069,861	-2,376,578
7. Recognition of Prior Deferred Inflows/Outflows	-3,792,617	-7,136,478
8. Recognition of Prior Deferred Flows Due to Change in Proportion	976,414	444,742
9. Ending Net Pension Liability	$96,943,208	$68,718,793

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – First 5

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	December 31, 2018	December 31, 2017
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$6,731,962	$8,035,666
2. Pension Expense	2,121,074	1,500,854
3. Employer Contributions	-1,022,889	-910,867
4. New Net Deferred Inflows/Outflows	2,541,212	-1,151,338
5. Change in Allocation of Prior Deferred Inflows/Outflows	3,478	-12,847
6. New Net Deferred Flows Due to Change in Proportion	142,975	-31,005
7. Recognition of Prior Deferred Inflows/Outflows	-396,271	-699,117
8. Recognition of Prior Deferred Flows Due to Change in Proportion	7,552	616
9. Ending Net Pension Liability	$10,129,093	$6,731,962

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – Housing Authority

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$8,244,509	$10,314,924
2. Pension Expense	2,374,551	1,743,917
3. Employer Contributions	-1,213,308	-1,115,522
4. New Net Deferred Inflows/Outflows	3,014,279	-1,410,022
5. Change in Allocation of Prior Deferred Inflows/Outflows	-370	-132,485
6. New Net Deferred Flows Due to Change in Proportion	-38,318	-329,742
7. Recognition of Prior Deferred Inflows/Outflows	-470,040	-856,196
8. Recognition of Prior Deferred Flows Due to Change in Proportion	103,402	29,635
9. Ending Net Pension Liability	$12,014,705	$8,244,509

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – LARPD

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$7,228,288	$8,644,696
2. Pension Expense	2,632,569	1,362,085
3. Employer Contributions	-1,100,236	-1,049,843
4. New Net Deferred Inflows/Outflows	6,916,511	-1,305,534
5. Change in Allocation of Prior Deferred Inflows/Outflows	-7,690	-103,646
6. New Net Deferred Flows Due to Change in Proportion	-8,318	-80,259
7. Recognition of Prior Deferred Inflows/Outflows	120,718	-244,277
8. Recognition of Prior Deferred Flows Due to Change in Proportion	23,020	5,066
9. Ending Net Pension Liability	$15,804,862	$7,228,288

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net Pension Liability – ACOE

Reporting Date for Employer under GASB 68	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 68	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net Pension Liability		
1. Beginning Net Pension Liability	$0	$194,451
2. Pension Expense	286,506	-25,625
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	1,354,026	0
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	-47,914
6. New Net Deferred Flows Due to Change in Proportion	0	-119,748
7. Recognition of Prior Deferred Inflows/Outflows	0	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	25,625	-1,164
9. Ending Net Pension Liability	$1,666,157	$0

EXHIBIT 12

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Expected and Actual Experience on Total Pension Liability

Reporting Date for Employer under GASB 68 Year Ended June 30	Differences between Expected and Actual Experience	Recognition Period (Years)	Reporting Date for Employer under GASB 68, Year Ended June 30: 2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	-$85,378,608	5.68	-$15,031,445	-$15,031,445	-$10,221,383	$0	$0	$0	$0	$0
2016	-31,964,793	5.64	-5,667,516	-5,667,516	-5,667,516	-3,627,213	0	0	0	0
2017	-68,175,766	5.60	-12,174,244	-12,174,244	-12,174,244	-12,174,244	-7,304,546	0	0	0
2018	17,516,316	5.47	3,202,252	3,202,252	3,202,252	3,202,252	3,202,252	1,505,056	0	0
2019	13,710,084	5.43	N/A	2,524,878	2,524,878	2,524,878	2,524,878	2,524,878	1,085,694	0
Net increase (decrease) in pension expense			-$29,670,953	-$27,146,075	-$22,336,013	-$10,074,327	-$1,577,416	$4,029,934	$1,085,694	$0

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Assumption Changes

Reporting Date for Employer under GASB 68 Year Ended June 30	Effects of Assumption Changes	Recognition Period (Years)	Reporting Date for Employer under GASB 68, Year Ended June 30: 2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	$431,863,478	5.68	$76,032,302	$76,032,302	$51,701,968	$0	$0	$0	$0	$0
2016	0	5.64	0	0	0	0	0	0	0	0
2017	150,676,929	5.60	26,906,594	26,906,594	26,906,594	26,906,594	16,143,959	0	0	0
2018	316,727,508	5.47	57,902,653	57,902,653	57,902,653	57,902,653	57,902,653	27,214,243	0	0
2019	0	5.43	N/A	0	0	0	0	0	0	0
Net increase (decrease) in pension expense			$160,841,549	$160,841,549	$136,511,215	$84,809,247	$74,046,612	$27,214,243	$0	$0

As described in Exhibit 9, the average of the expected remaining service lives of all employees that are provided with pensions through ACERA (active and inactive employees) determined as of December 31, 2017 (the beginning of the measurement period ending December 31, 2018) is 5.43 years.

EXHIBIT 12 (continued)

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Projected and Actual Earnings

Reporting Date for Employer under GASB 68 Year Ended June 30	Differences between Projected and Actual Earnings	Recognition Period (Years)	Reporting Date for Employer under GASB 68, Year Ended June 30: 2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	$121,984,072	5.00	$24,396,814	$24,396,816	$0	$0	$0	$0	$0	$0
2016	396,219,729	5.00	79,243,946	79,243,946	79,243,945	0	0	0	0	0
2017	16,987,820	5.00	3,397,564	3,397,564	3,397,564	3,397,564	0	0	0	0
2018	-601,849,317	5.00	-120,369,864	-120,369,864	-120,369,864	-120,369,864	-120,369,861	0		
2019	727,349,183	5.00	N/A	145,469,836	145,469,836	145,469,836	145,469,836	145,469,839	0	0
Net increase (decrease) in pension expense			-$13,331,540	$132,138,298	$107,741,481	$28,497,536	$25,099,975	$145,469,839	$0	$0

The differences between projected and actual earnings on pension plan investments are recognized over a five-year period per Paragraph 33b. of GASB 68.

Total Increase (Decrease) in Pension Expense

Reporting Date for Employer under GASB 68 Year Ended June 30	Total Differences and Changes	Reporting Date for Employer under GASB 68, Year Ended June 30: 2018	2019	2020	2021	2022	2023	2024	Thereafter
2015	$468,468,942	$85,397,671	$85,397,673	$41,480,585	$0	$0	$0	$0	$0
2016	364,254,936	73,576,430	73,576,430	73,576,429	-3,627,213	0	0	0	0
2017	99,488,983	18,129,914	18,129,914	18,129,914	18,129,914	8,839,413	0	0	0
2018	-267,605,493	-59,264,959	-59,264,959	-59,264,959	-59,264,959	-59,264,956	28,719,299	0	
2019	741,059,267	N/A	147,994,714	147,994,714	147,994,714	147,994,714	147,994,717	1,085,694	0
Net increase (decrease) in pension expense		$117,839,056	$265,833,772	$221,916,683	$103,232,456	$97,569,171	$176,714,016	$1,085,694	$0

Amortization amounts prior to June 30, 2018 have been omitted from this exhibit. These amounts can be found in prior years' GASB 68 reports.

EXHIBIT 13

Allocation of Changes in Total Net Pension Liability

In addition to the amounts shown in Exhibit 12, there are changes in each location's proportionate share of the total Net Pension Liability during the measurement period ending on December 31, 2018. The net effect of the change on the employer's proportionate share of the collective Net Pension Liability and collective deferred outflows of resources and deferred inflows of resources is also recognized over the average of the expected remaining service lives of all employees shown above. The difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ending on December 31, 2018 is recognized over the same periods. These recognized amounts are shown below. While these amounts are different for each employer, they sum to zero over the entire Retirement Association.

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Reporting Date for Employer under GASB 68, Year Ended June 30, 2019

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GASB 68, Year Ended June 30: 2019	2020	2021	2022	2023	2024	Thereafter
Alameda County	$1,738,127	5.43	$320,097	$320,097	$320,097	$320,097	$320,097	$137,642	$0
Health System	680,885	5.43	125,393	125,393	125,393	125,393	125,393	53,920	0
Superior Court	-2,537,099	5.43	-467,238	-467,238	-467,238	-467,238	-467,238	-200,909	0
First 5	175,250	5.43	32,275	32,275	32,275	32,275	32,275	13,875	0
Housing Authority	-46,967	5.43	-8,649	-8,649	-8,649	-8,649	-8,649	-3,722	0
LARPD	-10,196	5.43	-1,878	-1,878	-1,878	-1,878	-1,878	-806	0
ACOE	0	5.43	0	0	0	0	0	0	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0	$0

EXHIBIT 13 (continued)

Allocation of Changes in Total Net Pension Liability

The amounts as of June 30, 2018 are as follows:

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Reporting Date for Employer under GASB 68, Year Ended June 30, 2018

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GASB 68, Year Ended June 30: 2018	2019	2020	2021	2022	2023	Thereafter
Alameda County	-$9,479,381	5.47	-$1,732,979	-$1,732,979	-$1,732,979	-$1,732,979	-$1,732,979	-$814,486	$0
Health System	13,073,831	5.47	2,390,097	2,390,097	2,390,097	2,390,097	2,390,097	1,123,346	0
Superior Court	-2,908,250	5.47	-531,672	-531,672	-531,672	-531,672	-531,672	-249,890	0
First 5	-37,941	5.47	-6,936	-6,936	-6,936	-6,936	-6,936	-3,261	0
Housing Authority	-403,509	5.47	-73,767	-73,767	-73,767	-73,767	-73,767	-34,674	0
LARPD	-98,213	5.47	-17,954	-17,954	-17,954	-17,954	-17,954	-8,443	0
ACOE	-146,537	5.47	-26,789	-26,789	-26,789	-26,789	-26,789	-12,592	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0	$0

EXHIBIT 13 (continued)

Allocation of Changes in Total Net Pension Liability

The amounts as of June 30, 2017 are as follows:

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Reporting Date for Employer under GASB 68, Year Ended June 30, 2017

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GASB 68, Year Ended June 30: 2017	2018	2019	2020	2021	2022	Thereafter
Alameda County	$773,839	5.60	$138,186	$138,185	$138,185	$138,185	$138,185	$82,913	$0
Health System	-286,750	5.60	-51,206	-51,205	-51,205	-51,205	-51,205	-30,724	0
Superior Court	-657,369	5.60	-117,388	-117,387	-117,387	-117,387	-117,387	-70,433	0
First 5	178,251	5.60	31,831	31,830	31,830	31,830	31,830	19,100	0
Housing Authority	115,948	5.60	20,705	20,705	20,705	20,705	20,705	12,423	0
LARPD	-132,463	5.60	-23,653	-23,654	-23,654	-23,654	-23,654	-14,194	0
ACOE	8,544	5.60	1,525	1,526	1,526	1,526	1,526	915	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0	$0

EXHIBIT 13 (continued)

Allocation of Changes in Total Net Pension Liability

The amounts as of June 30, 2016 are as follows:

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Reporting Date for Employer under GASB 68, Year Ended June 30, 2016

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GASB 68, Year Ended June 30: 2016	2017	2018	2019	2020	2021	Thereafter
Alameda County	$716,115	5.64	$126,970	$126,970	$126,970	$126,970	$126,970	$81,265	$0
Health System	-1,234,870	5.64	-218,949	-218,949	-218,949	-218,949	-218,949	-140,125	0
Superior Court	221,160	5.64	39,213	39,213	39,213	39,213	39,213	25,095	0
First 5	95,336	5.64	16,904	16,904	16,904	16,904	16,904	10,816	0
Housing Authority	92,578	5.64	16,415	16,415	16,415	16,415	16,415	10,503	0
LARPD	106,148	5.64	18,821	18,821	18,821	18,821	18,821	12,043	0
ACOE	3,533	5.64	626	626	626	626	626	403	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0	$0

EXHIBIT 13 (continued)

Allocation of Changes in Total Net Pension Liability

The amounts as of June 30, 2015 are as follows:

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Reporting Date for Employer under GASB 68, Year Ended June 30, 2015

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GASB 68, Year Ended June 30: 2015	2016	2017	2018	2019	2020	Thereafter
Alameda County	$4,016,758	5.68	$707,177	$707,177	$707,177	$707,177	$707,177	$480,873	$0
Health System	-1,268,246	5.68	-223,283	-223,283	-223,283	-223,283	-223,283	-151,831	0
Superior Court	-2,082,105	5.68	-366,568	-366,568	-366,568	-366,568	-366,568	-249,265	0
First 5	-280,307	5.68	-49,350	-49,350	-49,350	-49,350	-49,350	-33,557	0
Housing Authority	-379,166	5.68	-66,755	-66,755	-66,755	-66,755	-66,755	-45,391	0
LARPD	-1,321	5.68	-233	-233	-233	-233	-233	-156	0
ACOE	-5,613	5.68	-988	-988	-988	-988	-988	-673	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0	$0

Actuarial Assumptions and Methods

For December 31, 2018 Measurement Date and Employer Reporting as of June 30, 2019

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 December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 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 pension plan investment expenses
Employee Contribution Crediting Rate:	7.25%, compounded semi-annually.
Consumer Price Index:	Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 3% maximum change per year for General Tier 1, General Tier 3, and Safety Tier 1, and 2% maximum change per year for General Tier 2, General Tier 4, Safety Tier 2, Safety Tier 2C, Safety Tier 2D, and Safety Tier 4.
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 valuation date.
Increase in Section 7522.10 Compensation Limit:	Increase of 3.00% per year from valuation date.

Salary Increases:

Annual Rate of Compensation Increase (%)

Inflation: 3.00%; plus an additional 0.50% "across the board" salary increases (other than inflation); plus the following Merit and Promotional increases based on service.

Service	General	Safety	Service	General	Safety
0-1	4.80%	7.80%	6-7	1.50%	1.60%
1-2	4.80	7.80	7-8	1.10	1.00
2-3	3.90	7.00	8-9	0.80	1.00
3-4	2.40	4.40	9-10	0.80	0.90
4-5	1.90	3.50	10-11	0.50	0.80
5-6	1.60	2.30	11+	0.40	0.80

Terminal Pay Assumptions:

Additional pay elements are expected to be received during a member's final average earnings period. The percentages, added to the final year salary, used in this valuation are:

	Service Retirement	Disability Retirement
General Tier 1	8.0%	6.5%
General Tier 2	3.0%	1.4%
General Tier 3	8.0%	6.5%
General Tier 4	N/A	N/A
Safety Tier 1	8.5%	6.4%
Safety Tier 2	3.5%	2.1%
Safety Tier 2C	3.5%	2.1%
Safety Tier 2D	3.5%	2.1%
Safety Tier 4	N/A	N/A

<u>Demographic Assumptions</u>:

Post-Retirement Mortality Rates - Healthy

General Members and All Beneficiaries:	Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected generationally with the two-dimensional MP-2016 projection scale.
Safety Members:	Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected generationally with the two-dimensional MP-2016 projection scale.

Post-Retirement Mortality Rates - Disabled

General Members:	Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set forward seven years for males and set forward four years for females, projected generationally with the two-dimensional MP-2016 projection scale.
Safety Members:	Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set forward two years for males and with no set forward for females, projected generationally with the two-dimensional MP-2016 projection scale.

The RPH-2014 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. These mortality tables were adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

Pre-Retirement Mortality Rates

General and Safety Members:	Headcount-Weighted RP-2014 (RPH-2014) Employee Mortality Tables multiplied by 80%, projected generationally with the two-dimensional MP-2016 projection scale.

Employee Contribution Rates

General Members:	Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 30% male and 70% female.

Employee Contribution Rates (Continued)

Safety Members: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 75% male and 25% female.

Optional Forms of Benefit

Service Retirement and All Beneficiaries

General Members: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 30% male and 70% female.

General Beneficiaries: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 70% male and 30% female.

Safety Members: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 75% male and 25% female.

Safety Beneficiaries: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 25% male and 75% female.

Disability Retirement

General Members: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set forward seven years for males and set forward four years for females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 30% male and 70% female.

Safety Members: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set forward two years for males and with no set forward for females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 75% male and 25% female.

Termination Rates Before Retirement[1]:

	Rate (%) Mortality			
	General[2]		Safety[2]	
Age	Male	Female	Male	Female
20	0.05	0.02	0.05	0.02
25	0.05	0.02	0.05	0.02
30	0.05	0.02	0.05	0.02
35	0.05	0.03	0.05	0.03
40	0.06	0.04	0.06	0.04
45	0.10	0.07	0.10	0.07
50	0.17	0.11	0.17	0.11
55	0.27	0.17	0.27	0.17
60	0.45	0.24	0.45	0.24
65	0.78	0.36	0.78	0.36

[1] *Note that generational projections beyond the base year (2014) are not reflected in the above mortality rates. All pre-retirement deaths are assumed to be non-service connected.*

[2] *Based on the Headcount-Weighted RP-2014 (RPH-2014) Employee Mortality Tables multiplied by 80%, projected generationally with the two-dimensional MP-2016 projection scale.*

Termination Rates Before Retirement (Continued):

	Rate (%)	
	Disability	
Age	General[1]	Safety[2]
20	0.00	0.00
25	0.01	0.03
30	0.03	0.26
35	0.05	0.58
40	0.08	0.73
45	0.19	0.78
50	0.31	1.52
55	0.38	2.00
60	0.43	2.60

[1] *60% of General disabilities are assumed to be service connected disabilities. The other 40% are assumed to be non-service connected disabilities.*

[2] *100% of Safety disabilities are assumed to be service connected disabilities.*

Termination Rates Before Retirement (Continued):

	Rate (%)	
	Termination (< 5 Years of Service)[1]	
Years of Service	General	Safety
0	11.00	4.00
1	9.00	3.50
2	8.00	3.50
3	6.00	2.50
4	6.00	2.00

	Termination (5+ Years of Service)[2]	
Age	General	Safety
20	6.00	2.00
25	6.00	2.00
30	5.40	2.00
35	4.40	1.70
40	3.40	1.20
45	3.00	1.00
50	3.00	1.00
55	3.00	1.00
60	3.00	0.40

(1) *60% of all terminated members are assumed to choose a refund of contributions. The other 40% are assumed to choose a deferred vested benefit.*

(2) *35% of all terminated members are assumed to choose a refund of contributions. The other 65% are assumed to choose a deferred vested benefit. No termination is assumed after a member is eligible for retirement (as long as a retirement rate is present).*

Retirement Rates:

	Rate[1] (%)							
Age	General Tier 1	General Tier 2	General Tier 3	General Tier 4	Safety Tier 1[2]	Safety Tier 2, 2D[2]	Safety Tier 2C[2]	Safety Tier 4
49	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
50	4.00	2.00	6.00	0.00	35.00	15.00	4.00	4.00
51	4.00	2.00	3.00	0.00	30.00	15.00	2.00	2.00
52	4.00	2.00	5.00	4.00	25.00	15.00	2.00	2.00
53	4.00	2.00	6.00	1.50	35.00	15.00	3.00	3.00
54	4.00	2.00	6.00	1.50	45.00	15.00	6.00	6.00
55	6.00	2.00	12.00	2.00	45.00	15.00	10.00	10.00
56	8.00	3.00	13.00	2.50	45.00	15.00	12.00	12.00
57	10.00	4.00	13.00	3.50	45.00	15.00	20.00	20.00
58	12.00	4.00	14.00	3.50	45.00	20.00	10.00	10.00
59	14.00	5.00	16.00	4.50	45.00	20.00	15.00	15.00
60	20.00	7.00	21.00	6.00	45.00	30.00	60.00	60.00
61	20.00	9.00	20.00	8.00	45.00	30.00	60.00	60.00
62	35.00	15.00	30.00	18.00	45.00	30.00	60.00	60.00
63	30.00	16.00	25.00	15.00	45.00	30.00	60.00	60.00
64	30.00	18.00	25.00	17.00	45.00	50.00	60.00	60.00
65	35.00	25.00	30.00	22.00	100.00	100.00	100.00	100.00
66	35.00	25.00	25.00	25.00	100.00	100.00	100.00	100.00
67	30.00	25.00	25.00	25.00	100.00	100.00	100.00	100.00
68	30.00	30.00	25.00	30.00	100.00	100.00	100.00	100.00
69	35.00	35.00	50.00	35.00	100.00	100.00	100.00	100.00
70	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
71	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
72	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
73	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
74	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00	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.*
(2) *Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.*

Retirement Age and Benefit for Deferred Vested Members:	General Retirement Age: 61 Safety Retirement Age: 56 Future deferred vested members who terminate with less than five years of service and are not vested are assumed to retire at age 70 for both General and Safety if they decide to leave their contributions on deposit. 30% of future General and 60% of future Safety deferred vested members are assumed to continue to work for a reciprocal employer. For reciprocals, 3.90% and 4.30% compensation increases are assumed per annum for General and Safety, respectively.
Future Benefit Accruals:	1.0 year of service per year of employment, plus 0.003 years of additional service for General members and 0.006 years of additional service for Safety members, to anticipate conversion of unused sick leave for each 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.
Data Adjustments:	Data as of November 30 has been adjusted to December 31 by adding one month of age and, for active members, one month of service.
Form of Payment:	All active and inactive vested members are assumed to elect the unmodified option at retirement.
Percent Married:	70% of male members; 50% of female members.
Age of Spouse:	Female spouses are 3 years younger than their male member spouses. Male spouses are 2 years older than their female member spouses.

Actuarial Cost Method: Entry Age Actuarial Cost Method. Entry Age is the age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation.

Actuarial Value of Assets: Market value of assets (MVA) less unrecognized returns in each of the last ten six-month 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 40% corridor; the AVA cannot be less than 60% of MVA, nor greater than 140% of MVA.

Valuation Value of Assets: The Actuarial Value of Assets reduced by the value of the non-valuation reserves.

Expected Remaining Service Lives: The average of the expected service lives of all employees is determined by:

- Calculating each active employee's expected remaining service life as the present value of $1 per year of future service at zero percent interest.
- Setting the remaining service life to zero for each non-active or retired member.
- Dividing the sum of the above amounts by the total number of active employee, non-active and retired members.

APPENDIX A

Calculation of Discount Rate as of December 31, 2018
Projection of Pension Plan's Fiduciary Net Position ($ in millions)

Year Beginning January 1,	Projected Beginning Plan Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Plan Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
2018	7,110	364	472	15	-216	6,771
2019	6,771	374	546	14	481	7,066
2020	7,066	393	573	15	502	7,372
2021	7,372	406	601	15	524	7,685
2022	7,685	414	630	16	546	7,998
2023	7,998	431	660	17	568	8,321
2024	8,321	443	690	17	590	8,647
2025	8,647	451	720	18	613	8,973
2026	8,973	460	750	19	636	9,300
2042	11,506	242	1,126	24	795	11,393
2043	11,393	220	1,134	24	786	11,242
2044	11,242	210	1,140	24	775	11,063
2045	11,063	209	1,146	23	761	10,864
2046	10,864	208	1,149	23	747	10,646
2087	291	37	116	1	18	229
2088	229	33	99	0 *	14	176
2089	176	30	83	0 *	10	134
2090	134	27	69	0 *	8	99
2091	99	24	57	0 *	6	71
2092	71	21	46	0 *	4	49
2093	49	18	37	0 *	3	33
2094	33	16	30	0 *	2	21
2095	21	14	23	0 *	1	12
2096	12	12	18	0 *	1	6
2097	6	10	14	0 *	0 *	3
2107	1	1	1	0 *	0 *	1
2108	1	1	1	0 *	0 *	0 *
2109	0 *	1	1	0 *	0 *	0 *
2110	0 *	0 *	1	0 *	0 *	0 *
2111	0 *	0 *	0 *	0 *	0 *	0 *
2132	0 *	0 *	0	0 *	0 *	0 *
2133	0 *	0 *	0	0 *	0 *	0 *
2133	Discounted Value: 0 *					

* *Less than $1M, when rounded.*

APPENDIX A (continued)

Calculation of Discount Rate as of December 31, 2018
Projection of Pension Plan's Fiduciary Net Position ($ in millions)

Notes:

(1) Amounts may not total exactly due to rounding.

(2) Amounts shown in the year beginning January 1, 2018 row are actual amounts, based on the financial statements provided by ACERA.

(3) Years 2027-2041, 2047-2086, 2098-2106, and 2112-2131 have been omitted from this table.

(4) Column (a): Except for the "discounted value" shown for 2133, all of the projected beginning plan fiduciary net position amounts shown have not been adjusted for the time value of money.

(5) Column (b): Projected total contributions include employee and employer normal cost contributions based on closed group projections (based on covered active members as of November 30, 2017); plus employer contributions to the unfunded actuarial accrued liability; plus employer contributions to fund each year's annual administrative expenses as well as future allocations of excess earnings to the SRBR under ACERA's funding policy, both reflecting a 20-year amortization schedule. Contributions are assumed to occur halfway through the year, on average.

(6) Column (c): Projected benefit payments have been determined in accordance with paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members, and beneficiaries as of November 30, 2017. The projected benefit payments reflect the cost of living increase assumption of 3.00% per annum for Tiers 1 and 3, and 2.00% per annum for Tiers 2 and 4. The projected benefit payments include the Non-OPEB Supplemental Retiree Benefits Reserve (SRBR) benefits to the extent the current Non-OPEB SRBR supports those benefits. Benefit payments are assumed to occur halfway through the year, on average. In accordance with paragraph 31.b.(1)(e) of GASB Statement No. 67, the long-term expected rate of return on Plan investments of 7.25% per annum was applied to all periods of projected benefit payments to determine the discount rate.

In addition, the projected benefit payments in column (c) include an amount equal to 0.60% of the beginning-of-year market value to reflect the approximated outflow of future allocations to the SRBR. This outflow has an estimated present value of $0.77 billion. This present value of outflow is expected to be sufficient to pay for the remaining present value of the non-OPEB SRBR benefits of $0.16 billion as well as the remaining present value of the OPEB SRBR benefits of $0.46 billion.

(7) Column (d): Projected administrative expenses are calculated as approximately 0.21% of the beginning plan fiduciary net position amount. The 0.21% portion was based on the actual fiscal year 2018 administrative expenses as a percentage of the beginning plan fiduciary net position amount as of January 1, 2018. Administrative expenses are assumed to occur halfway through the year, on average.

(8) Column (e): Projected investment earnings are based on the assumed investment rate of return of 7.25% per annum.

(9) As illustrated in this Exhibit, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.25% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of December 31, 2018 shown earlier in this report, pursuant to paragraph 44 of GASB Statement No. 67.

APPENDIX B

Glossary of Terms

Definitions of certain terms as they are used in Statement 68;[7] the terms may have different meanings in other contexts.

Active employees
Individuals employed at the end of the reporting or measurement period, as applicable.

Actual contributions
Cash contributions recognized as additions to a pension plan's Fiduciary Net Position.

Actuarial present value of projected benefit payments
Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.

Actuarial valuation
The determination, as of a point in time (the actuarial valuation date), of the service cost, Total Pension Liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.

Actuarial valuation date
The date as of which an actuarial valuation is performed.

Actuarially determined contribution
A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

Ad hoc cost-of-living adjustments (ad hoc COLAs)
Cost-of-living adjustments that require a decision to grant by the authority responsible for making such decisions.

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[7] *The definition for covered payroll is provided in GASB Statement No. 82 (which is an amendment of GASB Statements No. 67 and No. 68).*

APPENDIX B (continued)

Glossary of Terms

Ad hoc postemployment benefit changes
Postemployment benefit changes that require a decision to grant by the authority responsible for making such decisions.

Agent employer
An employer whose employees are provided with pensions through an agent multiple-employer defined benefit pension plan.

Agent multiple-employer defined benefit pension plan (agent pension plan)
A multiple-employer defined benefit pension plan in which pension plan assets are pooled for investment purposes but separate accounts are maintained for each individual employer so that each employer's share of the pooled assets is legally available to pay the benefits of only its employees.

Allocated insurance contract
A contract with an insurance company under which related payments to the insurance company are currently used to purchase immediate or deferred annuities for individual employees. Also may be referred to as an annuity contract.

Automatic cost-of-living adjustments (automatic COLAs)
Cost-of-living adjustments that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Automatic postemployment benefit changes
Postemployment benefit changes that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Closed period
A specific number of years that is counted from one date and declines to zero with the passage of time. For example, if the recognition period initially is five years on a closed basis, four years remain after the first year, three years after the second year, and so forth.

APPENDIX B (continued)

Glossary of Terms

Collective deferred outflows of resources and deferred inflows of resources related to pensions
Deferred outflows of resources and deferred inflows of resources related to pensions arising from certain changes in the collective Net Pension Liability.

Collective Net Pension Liability
The Net Pension Liability for benefits provided through (1) a cost-sharing pension plan or (2) a single-employer or agent pension plan in circumstances in which there is a special funding situation.

Collective pension expense
Pension expense arising from certain changes in the collective Net Pension Liability.

Contributions
Additions to a pension plan's Fiduciary Net Position for amounts from employers, nonemployer contributing entities (for example, state government contributions to a local government pension plan), or employees. Contributions can result from cash receipts by the pension plan or from recognition by the pension plan of a receivable from one of these sources.

Cost-of-living adjustments
Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-sharing employer
An employer whose employees are provided with pensions through a cost-sharing multiple-employer defined benefit pension plan.

Cost-sharing multiple-employer defined benefit pension plan (cost-sharing pension plan)
A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered payroll
The payroll on which contributions to a pension plan are based.

APPENDIX B (continued)

Glossary of Terms

Deferred retirement option program (DROP)
A program that permits an employee to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The employee continues to provide service to the employer and is paid for that service by the employer after the DROP entry date; however, the pensions that would have been paid to the employee (if the employee had retired and not entered the DROP) are credited to an individual employee account within the defined benefit pension plan until the end of the DROP period.

Defined benefit pension plans
Pension plans that are used to provide defined benefit pensions.

Defined benefit pensions
Pensions for which the income or other benefits that the employee will receive at or after separation from employment are defined by the benefit terms. The pensions may be stated as a specified dollar amount or as an amount that is calculated based on one or more factors such as age, years of service, and compensation. (A pension that does not meet the criteria of a defined contribution pension is classified as a defined benefit pension for purposes of Statement 68.)

Defined contribution pension plans
Pension plans that are used to provide defined contribution pensions.

Defined contribution pensions
Pensions having terms that (1) provide an individual account for each employee; (2) define the contributions that an employer is required to make (or the credits that it is required to provide) to an active employee's account for periods in which that employee renders service; and (3) provide that the pensions an employee will receive will depend only on the contributions (or credits) to the employee's account, actual earnings on investments of those contributions (or credits), and the effects of forfeitures of contributions (or credits) made for other employees, as well as pension plan administrative costs, that are allocated to the employee's account.

APPENDIX B (continued)

Glossary of Terms

Discount rate
The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following:

1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension plan's Fiduciary Net Position is projected (under the requirements of Statement 68) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments.

2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.

Entry age actuarial cost method
A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the *normal cost.* The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the *actuarial accrued liability.*

Inactive employees
Terminated individuals that have accumulated benefits but are not yet receiving them, and retirees or their beneficiaries currently receiving benefits.

Measurement period
The period between the prior and the current measurement dates.

Multiple-employer defined benefit pension plan
A defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

APPENDIX B (continued)

Glossary of Terms

Net Pension Liability
The liability of employers and nonemployer contributing entities to employees for benefits provided through a defined benefit pension plan.

Nonemployer contributing entities
Entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of Statement 68, employees are not considered nonemployer contributing entities.

Other postemployment benefits
All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits, regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.

Pension plans
Arrangements through which pensions are determined, assets dedicated for pensions are accumulated and managed, and benefits are paid as they come due.

Pensions
Retirement income and, if provided through a pension plan, postemployment benefits other than retirement income (such as death benefits, life insurance, and disability benefits). Pensions do not include postemployment healthcare benefits and termination benefits.

Plan members
Individuals that are covered under the terms of a pension plan. Plan members generally include (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members).

Postemployment
The period after employment.

Postemployment benefit changes
Adjustments to the pension of an inactive employee.

APPENDIX B (continued)

Glossary of Terms

Postemployment healthcare benefits
Medical, dental, vision, and other health-related benefits paid subsequent to the termination of employment.

Projected benefit payments
All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and their expected future service.

Public employee retirement association
A special-purpose government that administers one or more pension plans; also may administer other types of employee benefit plans, including postemployment healthcare plans and deferred compensation plans.

Real rate of return
The rate of return on an investment after adjustment to eliminate inflation.

Service costs
The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.

Single employer
An employer whose employees are provided with pensions through a single-employer defined benefit pension plan.

Single-employer defined benefit pension plan (single-employer pension plan)
A defined benefit pension plan that is used to provide pensions to employees of only one employer.

Special funding situations
Circumstances in which a nonemployer entity is legally responsible for making contributions directly to a pension plan that is used to provide pensions to the employees of another entity or entities and either of the following conditions exists:

1. The amount of contributions for which the nonemployer entity legally is responsible is *not* dependent upon one or more events or circumstances unrelated to the pensions.

2. The nonemployer entity is the only entity with a legal obligation to make contributions directly to a pension plan.

APPENDIX B (continued)

Glossary of Terms

Termination benefits
Inducements offered by employers to active employees to hasten the termination of services, or payments made in consequence of the early termination of services. Termination benefits include early-retirement incentives, severance benefits, and other termination-related benefits.

Total Pension Liability
The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of Statement 68.

APPENDIX C

Impact of the Application of the Declining Employer Payroll Policy for Use in the Determination of the Pension Expense for 2018.

As a result of implementation of the Declining Employer Payroll Policy as adopted by the Board, we have separated the following Plan's Fiduciary Net Position and TPL from the General (Excluding LARPD Tier 3 and Tier 4) membership class to the General ACOE membership class and General LARPD membership class. This separation was calculated as of December 31, 2017, for purposes of the rollforward of the TPL in the calculation of the NPL as of December 31, 2018.

	Transfer as of December 31, 2017 (for purposes of the rollforward of TPL to December 31, 2018)	General ACOE Members	General LARPD Tier 1 Members (to be combined with General LARPD Tier 3 and Tier 4 to become General LARPD Members)	Changes in General Membership Class, Excluding LARPD Tier 3 and Tier 4
1.	Transfer of Plan's Fiduciary Net Position	$3,434,159[(1)]	$15,846,631[(2)]	- $19,280,790
2.	Transfer of TPL	4,676,346	21,578,633	-26,254,979
3.	NPL after application of the Declining Employer Payroll Policy (2. - 1.)	1,242,187[(3)]	5,732,002[(4)]	-6,974,189
4.	NPL before application of the Declining Employer Payroll Policy for ACOE and LARPD Tier 1 (from Exhibit 7)	0	1,364,146	
5.	Additional NPL for ACOE and LARPD Tier 1[(5)] (3. - 4.)	1,242,187	4,367,856	

[(1)] *The $3,434,159 transfer of plan assets to ACOE is based on the allocated VVA of $3,319,475 as of December 31, 2017 plus a proportional share of the Contingency Reserve and Deferred Market gains as of that same date.*

[(2)] *The $15,846,631 transfer of plan assets to LARPD is based on the allocated VVA of $15,087,253 as of December 31, 2017, plus a true-up of $230,180 (on a VVA basis) as of December 31, 2017, plus a proportional share of the Contingency Reserve and Deferred Market gains as of that same date.*

[(3)] *This includes the NPL of the new beneficiary of the last active member who retired and died prior to December 31, 2017. This beneficiary was not included in the December 31, 2017 valuation data but has since been included in the December 31, 2018 valuation data.*

[(4)] *This includes a true-up of the NPL (TPL of $324,302 less plan assets of $238,132) as of December 31, 2017 to reflect the liability for a new retiree who was valued in the December 31, 2017 valuation as an inactive vested member based on the member's contribution account balance. The plan assets of $238,132 are based on a VVA of $230,180 as of December 31, 2017 plus a proportional share of the Contingency Reserve and Deferred Market gains as of that same date.*

[(5)] *These amounts, adjusted with interest, are used in determining the additional pension expense for 2018.*

Alameda County Employees' Retirement Association

Governmental Accounting Standards Board (GASB) 75 Actuarial Valuation and Review of the Benefits Provided by the Supplemental Retiree Benefits Reserve Other Postemployment Benefits (OPEB) Based on December 31, 2018 Measurement Date for Employer Reporting as of June 30, 2019

Segal Consulting

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

June 12, 2019

Board of Retirement
Alameda County Employees' Retirement Association
475 14th Street, Suite 1000
Oakland, CA 94612

Dear Board Members:

We are pleased to submit this Governmental Accounting Standards Board (GASB) Statement No. 75 Actuarial Valuation and Review of Other Postemployment Benefits (OPEB) based on a December 31, 2018 measurement date for employer reporting as of June 30, 2019. It contains various information that will need to be disclosed in order for ACERA employers to comply with GASB 75.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist the sponsors in preparing their financial report for their liabilities associated with the ACERA OPEB plan. The census and financial information on which our calculations were based was provided by ACERA. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. 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 health care cost, economic, or demographic assumptions; changes in health care trend, changes in economic or demographic assumptions; and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of Thomas Bergman, ASA, MAAA, Enrolled Actuary and Andy Yeung, ASA, MAAA, FCA, Enrolled Actuary. The health care trend and other related medical assumptions have been reviewed by Melissa A. Krumholz, FSA, MAAA. 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 used in this valuation and described in Section 3 are reasonably related to the experience of and the expectations for the Association.

We look forward to reviewing this report with you and to answering any questions.

Sincerely,

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

By: Andy Yeung   Thomas Bergman

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

Thomas Bergman, ASA, MAAA, EA
Retiree Health Actuary

TJH/bbf

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Purpose

This report has been prepared by Segal Consulting to present certain disclosure information required by Governmental Accounting Standard Board (GASB) Statement 75 for employer reporting as of June 30, 2019. The results used in preparing this GASB 75 report are comparable to those used in preparing the Governmental Accounting Standard Board Statement 74 report for the plan based on a measurement date and a reporting date as of December 31, 2018. This valuation is based on:

- The benefit provisions of the OPEB Plan, as administered by the Board of Retirement;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of November 30, 2017, provided by ACERA;
- The assets of the Plan as of December 31, 2018, provided by ACERA;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, health care trend, etc.

General Observations on GASB 75 Actuarial Valuation

The following points should be considered when reviewing this GASB 75 report:

- The Government Accounting Standard Board (GASB) rules only define OPEB liability and expense for financial reporting purposes, and do not apply to contribution amounts for OPEB funding purposes. Employers and plans still develop and adopt funding policies, if applicable, under current practices.
- When measuring OPEB liability, GASB uses the same actuarial cost method (Entry Age) and, for benefits that are being fully funded on an actuarial basis, the same expected return on Plan assets as used for funding.[1] This means that the Total OPEB Liability (TOL) measure for financial reporting shown in this report is determined on the same basis as the Actuarial Accrued Liability (AAL) measure for funding.

[1] *See discussions on next page regarding source of funding for payment of OPEB SRBR benefits not covered by current OPEB Plan's Fiduciary Net Position in the SRBR.*

- The Net OPEB Liability (NOL) is equal to the difference between the TOL and the Plan's Fiduciary Net Position. The Plan's Fiduciary Net Position is equal to the market value of assets and therefore, the NOL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) calculated on a market value basis. The NOL reflects all investment gains and losses as of the measurement date.

Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

- As we disclosed in our December 31, 2018 pension funding valuation report, the 7.25% investment return assumption that the Board approved on December 21, 2017 for determining the liabilities for funding purposes and used for establishing the employer and employee contribution rates has continued to be developed without considering the impact of any future 50/50 excess earnings allocation. This is based on our understanding that Article 5.5 of the Statute, which authorizes the allocation of 50% of excess earnings to the SRBR, does not allow for the use of a different investment return for funding than is used for interest crediting. This would appear in effect to preclude the prefunding of the SRBR through the use of an assumption lower than the market earnings assumption of 7.25%.

  As required by the Actuarial Standard of Practice (ASOP) No. 4 ("Measuring Pension Obligations and Determining Pension Plan Costs or Contributions"), we performed a stochastic model to estimate the impact of the 50% allocation of future excess earnings to the SRBR. The results of our model indicated that the 50/50 allocation of future excess earnings would have about the same impact as an "outflow" (i.e., assets not available to fund the benefits included in the determination of the Total Pension Liability) that would average approximately 0.60% of assets over time. This approximated outflow was incorporated into our GASB crossover test for the pension benefits (reference: Exhibit 5 of our GASB 67 report as of December 31, 2018), along with the additional future employer contributions that would result from those future allocations of excess earnings to the SRBR under ACERA's funding policy.

  Furthermore, note (6) provided in Exhibit 5 of the GASB 67 report indicates that the present value of outflows from the 0.60% of assets over time is expected to be higher than the present values of the remaining OPEB and non-OPEB SRBR benefits that could be paid after the exhaustion of assets currently available in the SRBR.

  Therefore, in developing the crossover test for the OPEB SRBR in Appendix A of this report, we have only included the projected benefits so that on a present value basis they are equal to the OPEB assets currently available in the SRBR as the remaining OPEB SRBR benefits would be paid from future excess earnings.

- The NOLs for the employers in ACERA as of December 31, 2017 and December 31, 2018 are allocated based on the actual employer contributions made during 2017 and 2018, respectively. [2] The steps we used for the allocation are as follows:

  -First calculate the ratio of the employer's contributions to the total contributions.

  -Then multiply this ratio by the NOL to determine the employer's proportionate share of the NOL.
  The NOL allocation can be found in Exhibit 7 in Section 2.

- The TOL as of December 31, 2018 was determined by rolling forward the liability results used in determining the sufficiency of the SRBR to provide medical and dental subsidy benefits as of December 31, 2017. That TOL has been adjusted to reflect the health care trend assumptions recommended for the sufficiency study for the SRBR as of December 31, 2018 (reference: our letter dated May 16, 2019)

- We have also continued the practice of adjusting the Plan's Fiduciary Net Position as of December 31, 2018 to include the $883.0 million set aside by the Retirement Board in the SRBR reserve to pay OPEB benefits as of December 31, 2018. It should be noted that as of December 31, 2018, the deferred investment <u>loss</u> for the entire Plan was $569.1 million and the Contingency Reserve was $0. Consequently, we have subtracted from the Plan's Fiduciary Net Position the proportionate share of the deferred investment loss that is commensurate with the size of the OPEB SRBR reserve, or $61.6 million (which will cause the future interest crediting rate to the SRBR reserve to drop below 7.25% per year).

- The NOL increased from $27.5 million as of December 31, 2017 to $232.9 million as of December 31, 2018 primarily as a result of unfavorable investment results during calendar year 2018 of about $209 million (for an actual market return of negative 14.1%[3] versus 7.25% assumed in the valuation), offset somewhat by updating health trend assumptions[4] (which on a net basis decreased the NOL by about $11.4 million). Changes in these values during the last two plan years ending December 31, 2018 and 2017 can be found in Exhibit 5.

- The OPEB expense increased from $7.7 million as of December 31, 2017 to $39.9 million as of December 31, 2018 primarily as a result of the expensed portion of the investment loss in 2018 of $41.9 million. Components of the OPEB expense during the last two plan years ending December 31, 2018 and 2017 can be found in Exhibit 8.

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[2] *The December 31, 2017 and December 31, 2018 NOL has been allocated to the different employers in proportion to the total employer contributions made by those employers to the pension plan during calendar years 2017 and 2018, respectively, based on discussions and approval provided by the Board.*

[3] *Note that the negative 14.1% market value investment return mentioned above for the SRBR is lower than the negative 4.62% investment return included in the December 31, 2018 Pension Funding Valuation for the Association's entire portfolio. The lower return for the SRBR is primarily a result of the reversal of the 50% of future excess earnings that might be allocated to the SRBR for the deferred investment gains as of December 31, 2017 to reflect future returns below 7.25% that might be allocated to the SRBR for the deferred investment losses as of December 31, 2018*

[4] *In particular, there is a reduction in the long term annual trend assumption from 4.5% to 4.0% for dental/vision and Medicare Part B which decreases the NOL by $23.7 million.*

Summary of Key Valuation Results

Reporting Date for Employer under GASB 75	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 75	**December 31, 2018**	**December 31, 2017**
Disclosure elements for plan year ending December 31:		
Service cost[1]	$31,577,168	$26,991,283
Total OPEB Liability	1,054,337,014	1,029,354,518
Plan's Fiduciary Net Position[2]	821,440,435	1,001,876,232
Net OPEB Liability	232,896,579	27,478,286
OPEB expense	39,920,817	7,709,300
Schedule of contributions for plan year ending December 31:		
Actuarially determined contributions	N/A	N/A
Actual contributions[3]	N/A	N/A
Contribution deficiency / (excess)	0	0
Demographic data for plan year ending December 31[4]:		
Number of retired members and beneficiaries receiving medical benefits	6,385	6,225
Number of retired members and beneficiaries receiving dental and vision benefits	7,519	7,270
Number of vested terminated members	410	381
Number of active members	11,349	11,323
Key assumptions as of December 31:		
Discount rate	7.25%	7.25%
Health care premium trend rates[5]		
Non-Medicare medical plan	Graded from 7.00% to ultimate 4.50% over 10 years	Graded from 7.00% to ultimate 4.50% over 10 years
Medicare medical plan	Graded from 6.50% to ultimate 4.50% over 8 years	Graded from 6.50% to ultimate 4.50% over 8 years
Dental/Vision and Medicare Part B	4.00%	4.50%

[1] *The service cost is based on the previous year's valuation, meaning the 2018 and 2017 values are based on the valuations as of December 31, 2017 and December 31, 2016, respectively. The 2018 service cost has been calculated using the assumptions shown in the 2017 column, and the 2017 service cost has been calculated using the following assumptions:*

Key assumptions as of December 31, 2016:	
Discount rate	*7.60%*
Health care premium trend rates	
Non-Medicare medical plan	*Graded from 6.50% to ultimate 4.50% over 8 years*
Medicare medical plan	*Graded from 6.50% to ultimate 4.50% over 8 years*
Dental/Vision and Medicare Part B	*4.50%*

[2] *For 2018, the Plan's Fiduciary Net Position shown ($821,440,435) includes the SRBR and 401(h) account ($889,953,169), less the SRBR implicit subsidy transfer ($6,939,808), less a proportionate share of the deferred market losses (after adjustment to include the balance in the Contingency Reserve) commensurate with the size of the OPEB reserves ($61,572,926). For 2017, the Plan's Fiduciary Net Position amount shown ($1,001,876,232) includes the SRBR and 401(h) account ($863,836,077), less the SRBR implicit subsidy transfer ($5,830,283), plus a proportionate share of one half of the deferred market gains (after adjustment to include the balance in the Contingency Reserve) commensurate with the size of the OPEB and non-OPEB reserves ($143,870,438). Note that amounts may not total properly due to rounding.*

[(3)] *Employer contributions are on a net basis. Benefits are funded by employer contributions to the 401(h) account and similar amounts are transferred from the SRBR to the Employers Advance Reserve to backfill the employer contributions that would have otherwise been made to the Retirement Plan*

[(4)] *The December 31, 2017 data is used in the measurement of the TOL as of December 31, 2018. The following data as of December 31, 2016 was used in the measurement of the TOL as of December 31, 2017:*

Number of retired members and beneficiaries receiving medical benefits	*6,018*
Number of retired members and beneficiaries receiving dental and vision benefits	*7,049*
Number of vested terminated members	*371*
Number of active members	*11,111*

The demographic data as of December 31, 2018 will be used in the sufficiency study for the SRBR as of December 31, 2018 as well as in the next year's GAS 74 and 75 valuation when we roll forward the liability from December 31, 2018 to December 31, 2019.

[(5)] *The trend rates shown above for 2019 are before reflecting a one-time adjustment to reflect the estimated impact of the Health Insurance Tax (HIT). The weighted average increase amongst all carriers is approximately 1.2% for Non-Medicare and 0.9% for Medicare Plans.*

Important Information about Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a postretirement health plan. It is an estimated forecast – the actual cost of the plan will be determined by the benefits and expenses paid, not by the actuarial valuation.

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

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan description in this 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 ACERA. 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.
- **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 health care trends. 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.
- **Assets** This valuation is based on the market value of assets as of the valuation date, as provided by ACERA. The Association uses an actuarial value of assets that differs from market value of assets to gradually reflect six-month changes in the market value of assets in the SRBR sufficiency valuation.

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

- The valuation is prepared at the request of the Board to assist sponsors of the Fund in preparing items related to the OPEB SRBR plan in their financial reports. 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.
- If ACERA 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. ACERA 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 ACERA, it is not a fiduciary in its capacity as actuaries and consultants with respect to ACERA.

EXHIBIT 1

General Information – "Financial Statements", Note Disclosures and Required Supplementary Information for a Cost-Sharing OPEB Plan

Plan Description

Plan administration. The Alameda County Employees' Retirement Association (ACERA) was established by the Alameda County Board of Supervisors in 1947. ACERA is administered by the Board of Retirement and governed by the County Employees' Retirement Law of 1937 (California Government Code Section 31450 et. seq.). ACERA is a cost-sharing, multiple employer, defined benefit, public employee retirement system whose main function is to provide service retirement, disability, death, and survivor benefits to the General and Safety members employed by the County of Alameda. ACERA also provides retirement benefits to the employee members of First 5 Alameda County, Housing Authority of the County of Alameda, Alameda Health System, Livermore Area Recreation and Park District (LARPD), Superior Court of California—County of Alameda, and Alameda County Office of Education.

The management of ACERA is vested with the ACERA Board of Retirement. The Board consists of nine members and two alternates. The County Treasurer is a member of the Board of Retirement by law and is elected by the general public. Four members are appointed by the Board of Supervisors, one of whom may be a County Supervisor. Two active members are elected by the General members; one active member and one alternate are elected by the Safety members; one retired member and one alternate are elected by the retired members. All members of the Board of Retirement serve terms of three years except for the County Treasurer whose term runs concurrent with his term as County Treasurer.

Plan membership. At December 31, 2018, OPEB plan membership consisted of the following:

Retired members or beneficiaries currently receiving medical benefits	6,385
Retired members or beneficiaries currently receiving dental and vision benefits	7,519
Vested terminated members entitled to, but not yet receiving benefits	410
Active members	11,349

Note: Data as of December 31, 2018 is not used in the measurement of the TOL as of December 31, 2018. It will be used for the sufficiency study for the SRBR as of December 31, 2018 as well as in next year's GAS 74 and 75 valuation.

Benefits provided. ACERA provides benefits to eligible employees.

Membership Eligibility:

Service Retirees: Retired with at least 10 years of service (including deferred vested members who terminate employment and receive a retirement benefit from ACERA)

Disabled Retirees: A minimum of 10[5] years of service is required for non-duty disability.

There is no minimum service requirement for duty disability.

Benefit Eligibility:

1. Monthly Medical Allowance

Service Retirees: For retirees not purchasing individual insurance through the Individual Medicare Insurance Exchange, a Maximum Monthly Medical Allowance of $540.44 per month was provided, effective January 1, 2018 and through December 31, 2018. For the period January 1, 2019 through December 31, 2019, the maximum allowance is $558.00 per month.

For those purchasing insurance through the Individual Medicare Exchange, the Monthly Medical Allowance was $414.00 per month for 2018 and is $427.46 for 2019.

These Allowances are subject to the following subsidy schedule:

Completed Years of Service	Percentage Subsidized
10-14	50%
15-19	75%
20+	100%

Disabled Retirees: Non-duty disabled retirees receive the same Monthly Medical Allowance as service retirees.

Duty disabled retirees receive the same Monthly Medical Allowance as those service retirees with 20 or more years of service.

[5] *The 10 years of service requirement is only used for determining eligibility for health benefits. For pension benefits, the eligibility requirement is 5 years of service.*

2. Medicare Benefit Reimbursement Plan:

The SRBR reimburses the full Medicare Part B premium to qualified retired members.

To qualify for reimbursement, a retiree must:

- Have at least 10 years of ACERA service,
- Be eligible for Monthly Medical Allowance,
- Provide proof of enrollment in Medicare Part B.

3. Dental and Vision Plans:

The SRBR provides dental and vision benefits for retirees only. The maximum combined monthly dental and vision premiums will be $47.91 in 2018 and $48.39 in 2019. The eligibility for these premiums is as follows:

Service Retirees: Retired with at least 10 years of service.

Disabled Retirees: For non-duty disabled retirees, 10 years of service is required. For grandfathered non-duty disabled retirees (with effective retirement dates on or before January 31, 2014), there is no minimum service requirement.

For duty disabled retirees, there is no minimum service requirement.

Note about Monthly Medical Allowance:

The maximum levels of subsidy are reviewed by the Board annually and are not indexed to increase automatically.

In addition, the Monthly Medical Allowance can only be used to pay for retiree medical benefits. There is no benefit payable to beneficiaries, current spouses, former spouses or dependents.

If the actual cost of coverage is less than the Monthly Medical Allowance, the difference is not paid in cash or applied towards the coverage for beneficiaries, current spouses, former spouses or dependents.

Deferred Benefit:	Members who terminate employment with 10 or more years of service before reaching Pension eligibility commencement age may elect deferred MMA and/or dental/vision benefits.
Death Benefit:	Surviving spouses/domestic partners of members who die before the member commences retiree health benefits may enroll in an ACERA group medical plan on the date that the member would have been eligible to commence benefits. The surviving spouse/domestic partner must pay 100% of the premium. Because premiums for surviving spouses/domestic partners under age 65 include active participants for purposes of underwriting, the surviving spouses/domestic partners receive an implicit subsidy from the actives, which creates a liability for the SRBR.

EXHIBIT 2

Net OPEB Liability

Reporting Date for Employer under GASB 75 **Measurement Date for Employer under GASB 75**	**June 30, 2019** **December 31, 2018**	**June 30, 2018** **December 31, 2017**
The components of the Net OPEB Liability are as follows:		
Total OPEB Liability	$1,054,337,014	$1,029,354,518
Plan's Fiduciary Net Position	821,440,435	1,001,876,232
Net OPEB Liability	$232,896,579	$27,478,286
Plan's Fiduciary Net Position as a Percentage of the Total OPEB Liability	77.91%	97.33%

The Net OPEB Liability was measured as of December 31, 2018 and 2017. The Plan's Fiduciary Net Position (plan assets) was valued as of the measurement date, while the Total OPEB Liability was determined by rolling forward the Total OPEB Liability as of December 31, 2017 and 2016, respectively.

Plan provisions. The plan provisions used in the measurement of the NOL as of December 31, 2018 and December 31, 2017 are the same as those used in ACERA's SRBR sufficiency valuation as of December 31, 2017 and December 31, 2016, respectively.

Actuarial assumptions. The actuarial assumptions used for the December 31, 2018 valuation were based on the results of the experience study for the period from December 1, 2013 through November 30, 2016 that were approved by the Board effective with the December 31, 2017 valuation and the health care trend assumptions used in the sufficiency study for the SRBR as of December 31, 2018 (reference: our letter dated March 16, 2019). The assumptions used in the December 31, 2018 SRBR OPEB actuarial valuation for ACERA were applied to all periods included in the measurement:

December 31, 2018	
Investment rate of return	7.25%, net of OPEB plan investment expense, including inflation
Inflation	3.00%
Health care premium trend rates*	
Non-Medicare medical plan	Graded from 7.00% to ultimate 4.50% over 10 years
Medicare medical plan	Graded from 6.50% to ultimate 4.50% over 8 years
Dental/Vision and Medicare Part B	4.00%
Other assumptions	Same as those proposed in the experience study for the period December 1, 2013 through November 30, 2016

December 31, 2017

Investment rate of return	7.25%, net of OPEB plan investment expense, including inflation
Inflation	3.00%
Health care premium trend rates	
Non-Medicare medical plan	Graded from 7.00% to ultimate 4.50% over 10 years
Medicare medical plan	Graded from 6.50% to ultimate 4.50% over 8 years
Dental/Vision and Medicare Part B	4.50%
Other assumptions	Same as those proposed in the experience study for the period December 1, 2013 through November 30, 2016

* The trend rates shown above for 2019 are before reflecting a one-time adjustment to reflect the impact of the Health Insurance Tax (HIT). The weighted average increase amongst all carriers is approximately 1.2% for Non-Medicare and 0.9% for Medicare plans.

EXHIBIT 3

Target Asset Allocation

The long-term expected rate of return on OPEB plan investments[6] was determined in 2017 using a building-block method in which expected future real rates of return (expected returns, net of pension plan inflation) are developed for each major asset class. The returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation and subtracting expected investment expenses and a risk margin.

The target allocation and projected arithmetic real rates of return for each major asset class, after deducting inflation, but before deducting investment expenses, are summarized in the following table. These values were used in the derivation of the long-term expected investment rate of return assumption for the December 31, 2018 valuation. This information is subject to change every three years based on the actuarial experience study:

Asset Class	Target Allocation	Long-Term (Arithmetic) Expected Real Rate of Return
Domestic Large Cap Equity	22.40%	5.75%
Domestic Small Cap Equity	5.60%	6.37%
Developed International Equity	19.50%	6.89%
Emerging Markets Equity	6.50%	9.54%
U.S. Core Fixed Income	11.25%	1.03%
High Yield Bonds	1.50%	3.99%
International Bonds	2.25%	0.19%
TIPS	2.00%	0.98%
Real Estate	8.00%	4.47%
Commodities	3.00%	3.78%
Hedge Funds	9.00%	4.30%
Private Equity	9.00%	7.60%
Total	100.00%	

[6] *Note that the investment return assumption for SRBR sufficiency testing (and pension plan funding) purposes was developed net of both investment and administrative expenses; however, the same investment return assumption was adopted by the Board for financial reporting purposes, and it was considered gross of administrative expenses for financial reporting purposes. (This resulted in an increase in the margin for adverse deviation when using that assumption for financial reporting.)*

Discount rate: The discount rate used to measure the Total OPEB Liability was 7.25% as of December 31, 2018 and December 31, 2017. The projection of cash flows used to determine the discount rate assumed benefits are paid out of current OPEB SRBR assets. Based on those assumptions, the SRBR OPEB plan's Fiduciary Net Position was projected to be available to make all projected future benefits payments for current plan members.[7] Therefore the long-term expected rate of return on OPEB plan investments was applied to all periods of projected benefit payments to determine the Total OPEB Liability as of December 31, 2018 and December 31, 2017.

[7] *See discussions in Section 1 regarding source of funding for payment of OPEB SRBR benefits not covered by current OPEB SRBR Plan's Fiduciary Net Position.*

EXHIBIT 4

Discount Rate and Trend Sensitivity

Sensitivity of the Net OPEB Liability to changes in the discount rate. The following presents the Net OPEB Liability (NOL) of ACERA as of December 31, 2018, calculated using the discount rate of 7.25%, as well as what ACERA's NOL would be if it were calculated using a discount rate that is 1-percentage-point lower (6.25%) or 1-percentage-point higher (8.25%) than the current rate:

Net OPEB Liability	1% Decrease (6.25%)	Current Discount Rate (7.25%)	1% Increase (8.25%)
Alameda County	$277,592,855	$177,817,632	$94,451,250
Health System	68,288,034	43,743,260	23,235,073
Superior Court	13,198,222	8,454,384	4,490,708
First 5	1,379,013	883,354	469,210
Housing Authority	1,635,729	1,047,799	556,559
LARPD	1,483,289	950,150	504,690
ACOE	0	0	0
Total for all Employers	$363,577,142	$232,896,579	$123,707,490

Sensitivity of the Net OPEB Liability to changes in the healthcare cost trend rate. The following presents the NOL of ACERA as of December 31, 2018, as well as what ACERA's NOL would be if it were calculated using a trend rate that is 1-percentage-point lower or 1-percentage-point higher than the current rate:

Net OPEB Liability	1% Decrease	Current Trend Rates*	1% Increase
Alameda County	$84,390,008	$177,817,632	$292,365,386
Health System	20,760,000	43,743,260	71,922,086
Superior Court	4,012,344	8,454,384	13,900,586
First 5	419,229	883,354	1,452,399
Housing Authority	497,272	1,047,799	1,722,777
LARPD	450,929	950,150	1,562,224
ACOE	0	0	0
Total for all Employers	$110,529,782	$232,896,579	$382,925,458

* *Current trend rates: 7.00% graded down to 4.5% over 10 years for Non-Medicare medical plan costs; 6.50% graded down to 4.5% over 8 years for Medicare medical plan costs and 4.0% for all years for Dental, Vision and Medicare Part B costs. The medical trend rates shown above for 2019 (7.00% and 6.50% for non-Medicare and Medicare plans, respectively) are before reflecting a one-time adjustment to reflect the estimated impact of the Health Insurance Tax (HIT). The weighted average increase amongst all carriers is approximately 1.2% for Non-Medicare and 0.9% for Medicare plans.*

EXHIBIT 5

Schedules of Changes in Net OPEB Liability – Last Two Fiscal Years

Reporting Date for Employer under GASB 75	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 75	**December 31, 2018**	**December 31, 2017**
Total OPEB Liability		
Service cost[1]	$31,577,168	$26,991,283
Interest	73,426,531	69,878,539
Change of benefit terms	0	0
Differences between expected and actual experience	-27,712,610	-21,627,766
Changes of assumptions	-11,429,923	58,973,316
Benefit payments	-40,878,670	-37,903,590
Net change in Total OPEB Liability	$24,982,496	$96,311,782
Total OPEB Liability – beginning	1,029,354,518	933,042,736
Total OPEB Liability – ending (a)	$1,054,337,014	$1,029,354,518
Plan's Fiduciary Net Position		
Contributions – employer[2]	N/A	N/A
Contributions – employee	N/A	N/A
Net investment income	-$138,332,627	$243,187,807
Benefit payments	-40,878,670	-37,903,590
Administrative expense	-1,224,500	-1,203,500
Other	0	0
Net change in Plan's Fiduciary Net Position	-$180,435,797	$204,080,717
Plan's Fiduciary Net Position – beginning[3]	1,001,876,232	797,795,515
Plan's Fiduciary Net Position – ending (b)[3]	$821,440,435	$1,001,876,232
Net OPEB Liability – ending (a) – (b)	$232,896,579	$27,478,286
Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability	77.91%	97.33%
Covered-employee payroll[4]	$1,046,033,851	$995,178,209
Plan Net OPEB Liability as percentage of covered-employee payroll	22.26%	2.76%

(1) *The service cost is always based on the previous year's valuation, meaning the valuation as of December 31, 2017 and 2016, respectively.*

(2) *Employer contributions are on a net basis. Benefits are funded by employer contributions to the 401(h) account and similar amounts are transferred from the SRBR to the Employers Advance Reserve to backfill the employer contributions that would have otherwise been made to the Retirement Plan.*

(3) *See footnote (2) on page iv for a discussion on the development of the 2018 "Plan's Fiduciary Net Position – beginning" amount of $1,001,876,232 and the 2018 "Plan's Fiduciary Net Position – ending" amount of $821,440,435.*

(4) *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 6

Schedule of Employer Contributions – Last Ten Fiscal Years

Year Ended December 31	Actuarially Determined Contributions[1]	Contributions in Relation to the Actuarially Determined Contributions[1]	Contribution Deficiency / (Excess)	Covered-Employee Payroll[2]	Contributions as a Percentage of Covered-Employee Payroll
2009	N/A	N/A	0	$838,141,323	0.00
2010	N/A	N/A	0	839,617,361	0.00
2011	N/A	N/A	0	837,482,162	0.00
2012	N/A	N/A	0	845,932,592	0.00
2013	N/A	N/A	0	853,349,657	0.00
2014	N/A	N/A	0	886,924,862	0.00
2015	N/A	N/A	0	945,858,017[3]	0.00
2016	N/A	N/A	0	947,567,631	0.00
2017	N/A	N/A	0	995,178,209	0.00
2018	N/A	N/A	0	1,046,033,851	0.00

(1) *Benefits are funded by employer contributions to the 401(h) account and similar amounts are transferred from the SRBR to the Employers Advance Reserve to backfill the employer contributions that would have otherwise been made to the Retirement Plan.*

(2) *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

(3) *ACERA indicated that this amount is based on 27 pay periods for 2015.*

EXHIBIT 7

Determination of Proportionate Share

Actual Employer Contributions by Employer
January 1, 2017 to December 31, 2017

Employer	Contributions	Percentage*
Alameda County	$188,482,504	76.289%
Health System	46,206,829	18.702%
Superior Court	9,297,985	3.763%
First 5	910,867	0.369%
Housing Authority	1,115,522	0.452%
LARPD	1,049,843	0.425%
ACOE	0	0.000%
Total for all Employers	$247,063,550	100.000%

* The unrounded percentages are used in the allocation of the NOL amongst employers.

Allocation of December 31, 2017 Net OPEB Liability

Employer	NOL	Percentage
Alameda County	$20,962,931	76.289%
Health System	5,139,101	18.702%
Superior Court	1,034,117	3.763%
First 5	101,306	0.369%
Housing Authority	124,068	0.452%
LARPD	116,763	0.425%
ACOE**	0	0.000%
Total for all Employers	$27,478,286	100.000%

**There is no allocation of NOL to ACOE, since there were no employer contributions made during 2017 for that employer

Notes:

1. Based on the January 1, 2017 through December 31, 2017 employer contributions in total as provided by ACERA.
2. The Net OPEB Liability (NOL) is the Total OPEB Liability (TOL) minus the OPEB SRBR Plan's Fiduciary Net Position (plan assets).
3. The employer's share of the total plan NOL is the ratio of the employer's total contributions to the total contributions for all employers.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Actual Employer Contributions by Employer
January 1, 2018 to December 31, 2018

Employer	Contributions	Percentage*
Alameda County	$205,905,618	76.351%
Health System	50,652,924	18.782%
Superior Court	9,789,834	3.630%
First 5	1,022,889	0.379%
Housing Authority	1,213,308	0.450%
LARPD	1,100,236	0.408%
ACOE	0	0.000%
Total for all Employers	$269,684,809	100.000%

* The unrounded percentages are used in the allocation of the NOL amongst employers.

Allocation of December 31, 2018 Net OPEB Liability

Employer	NOL	Percentage
Alameda County	$177,817,632	76.351%
Health System	$43,743,260	18.782%
Superior Court	$8,454,384	3.630%
First 5	$883,354	0.379%
Housing Authority	$1,047,799	0.450%
LARPD	$950,150	0.408%
ACOE	0	0.000%
Total for all Employers	$232,896,579	100.000%

Notes:

1. Based on the January 1, 2018 through December 31, 2018 employer contributions in total as provided by ACERA.
2. The Net OPEB Liability (NOL) is the Total OPEB Liability (TOL) minus the OPEB SRBR Plan's Fiduciary Net Position (plan assets).
3. The employer's share of the total plan NOL is the ratio of the employer's total contributions to the total contributions for all employers.
4. ACOE was not required to make any Pension Plan contributions during 2018 because their payroll was $0 in 2018. However, they are required to make a contribution under the Declining Employer Payroll Policy starting in 2019. As they would be expected to make a large lump sum contribution to partially pay off their liability in 2019, we would consult with the auditor on whether any special adjustment needs to be made when we report their NOL next year.

EXHIBIT 7 (continued)

Determination of Proportionate Share

Notes:

For purposes of the results in this exhibit, the reporting date for the employer under GASB 75 is June 30, 2019. The reporting date and measurement date for the plan under GASB 74 are December 31, 2018. Consistent with the provisions of GASB 75, the assets and liabilities measured as of December 31, 2018 are not adjusted or rolled forward to the June 30, 2019 reporting date. Other results, such as the total deferred inflows and outflows would also be allocated based on the same proportionate shares determined above.

The following items are allocated based on the corresponding proportionate share:

1) Net OPEB Liability
2) Service Cost
3) Interest on the Total OPEB Liability
4) Current-period benefit changes
5) Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability
6) Expensed portion of current-period changes of assumptions or other inputs
7) Member contributions
8) Projected earnings on plan investments
9) Expensed portion of current-period differences between actual and projected earnings on plan investments
10) Administrative expense
11) Recognition of beginning of year deferred outflows of resources as OPEB expense
12) Recognition of beginning of year deferred inflows of resources as OPEB expense

EXHIBIT 8
OPEB Expense – Total for all Employers

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Components of OPEB Expense		
1. Service cost	$31,577,168	$26,991,283
2. Interest on the Total OPEB Liability	73,426,531	69,878,539
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
4. Current-period benefit changes	0	0
5. Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability	(4,154,814)	(3,237,690)
6. Expensed portion of current-period changes of assumptions or other inputs	(1,713,632)	8,828,341
7. Member contributions	0	0
8. Projected earnings on plan investments	(71,109,787)	(59,146,390)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	41,888,483	(36,808,283)
10. Administrative expense	1,224,500	1,203,500
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as OPEB expense	8,828,341	0
13. Recognition of beginning of year deferred inflows of resources as OPEB expense	(40,045,973)	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	0	0
OPEB Expense	$39,920,817	$7,709,300

EXHIBIT 8 (Continued)
OPEB Expense – Alameda County

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Components of OPEB Expense		
1. Service cost	$24,109,319	$20,591,398
2. Interest on the Total OPEB Liability	56,061,501	53,309,693
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	13,157	(100,451)
4. Current-period benefit changes	0	0
5. Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability	(3,172,221)	(2,470,003)
6. Expensed portion of current-period changes of assumptions or other inputs	(1,308,365)	6,735,060
7. Member contributions	0	0
8. Projected earnings on plan investments	(54,292,656)	(45,122,236)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	31,982,053	(28,080,699)
10. Administrative expense	934,911	918,140
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as OPEB expense	6,740,479	0
13. Recognition of beginning of year deferred inflows of resources as OPEB expense	(30,575,288)	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(100,451)	0
OPEB Expense	$30,392,439	$5,780,902

EXHIBIT 8 (Continued)

OPEB Expense – Health System

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Components of OPEB Expense		
1. Service cost	$5,930,907	$5,048,021
2. Interest on the Total OPEB Liability	13,791,168	13,068,968
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	17,117	158,430
4. Current-period benefit changes	0	0
5. Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability	(780,368)	(605,526)
6. Expensed portion of current-period changes of assumptions or other inputs	(321,859)	1,651,112
7. Member contributions	0	0
8. Projected earnings on plan investments	(13,356,031)	(11,061,798)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	7,867,607	(6,884,035)
10. Administrative expense	229,989	225,083
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as OPEB expense	1,658,163	0
13. Recognition of beginning of year deferred inflows of resources as OPEB expense	(7,521,542)	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	158,430	0
OPEB Expense	$7,673,581	$1,600,255

EXHIBIT 8 (Continued)

OPEB Expense – Superior Court

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Components of OPEB Expense		
1. Service cost	$1,146,283	$1,015,789
2. Interest on the Total OPEB Liability	2,665,458	2,629,808
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	(28,569)	(36,898)
4. Current-period benefit changes	0	0
5. Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability	(150,824)	(121,847)
6. Expensed portion of current-period changes of assumptions or other inputs	(62,207)	332,246
7. Member contributions	0	0
8. Projected earnings on plan investments	(2,581,358)	(2,225,914)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	1,520,595	(1,385,242)
10. Administrative expense	44,451	45,292
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as OPEB expense	320,478	0
13. Recognition of beginning of year deferred inflows of resources as OPEB expense	(1,453,710)	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(36,898)	0
OPEB Expense	$1,383,699	$253,234

EXHIBIT 8 (Continued)

OPEB Expense – First 5

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Components of OPEB Expense		
1. Service cost	$119,771	$99,512
2. Interest on the Total OPEB Liability	278,500	257,626
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	2,275	(548)
4. Current-period benefit changes	0	0
5. Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability	(15,759)	(11,937)
6. Expensed portion of current-period changes of assumptions or other inputs	(6,500)	32,548
7. Member contributions	0	0
8. Projected earnings on plan investments	(269,713)	(218,059)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	158,879	(135,704)
10. Administrative expense	4,644	4,437
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as OPEB expense	33,485	0
13. Recognition of beginning of year deferred inflows of resources as OPEB expense	(151,891)	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(548)	0
OPEB Expense	$153,143	$27,875

EXHIBIT 8 (Continued)

OPEB Expense – Housing Authority

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Components of OPEB Expense		
1. Service cost	$142,064	$121,869
2. Interest on the Total OPEB Liability	330,345	315,510
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	(346)	(5,105)
4. Current-period benefit changes	0	0
5. Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability	(18,692)	(14,619)
6. Expensed portion of current-period changes of assumptions or other inputs	(7,710)	39,861
7. Member contributions	0	0
8. Projected earnings on plan investments	(319,922)	(267,053)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	188,456	(166,194)
10. Administrative expense	5,509	5,434
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as OPEB expense	39,719	0
13. Recognition of beginning of year deferred inflows of resources as OPEB expense	(180,166)	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(5,105)	0
OPEB Expense	$174,152	$29,703

EXHIBIT 8 (Continued)
OPEB Expense – LARPD

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Components of OPEB Expense		
1. Service cost	$128,824	$114,694
2. Interest on the Total OPEB Liability	299,559	296,934
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	(3,634)	(13,608)
4. Current-period benefit changes	0	0
5. Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability	(16,950)	(13,758)
6. Expensed portion of current-period changes of assumptions or other inputs	(6,991)	37,514
7. Member contributions	0	0
8. Projected earnings on plan investments	(290,107)	(251,330)
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	170,893	(156,409)
10. Administrative expense	4,996	5,114
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as OPEB expense	36,017	0
13. Recognition of beginning of year deferred inflows of resources as OPEB expense	(163,376)	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(13,608)	0
OPEB Expense	$145,623	$19,151

EXHIBIT 8 (Continued)
OPEB Expense – ACOE

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Components of OPEB Expense		
1. Service cost	$0	$0
2. Interest on the Total OPEB Liability	0	0
3. Expensed portion of current-period changes in proportion and differences between employer's contributions and proportionate share of contributions	0	(1,820)
4. Current-period benefit changes	0	0
5. Expensed portion of current-period difference between actual and expected experience in the Total OPEB Liability	0	0
6. Expensed portion of current-period changes of assumptions or other inputs	0	0
7. Member contributions	0	0
8. Projected earnings on plan investments	0	0
9. Expensed portion of current-period differences between actual and projected earnings on plan investments	0	0
10. Administrative expense	0	0
11. Other	0	0
12. Recognition of beginning of year deferred outflows of resources as OPEB expense	0	0
13. Recognition of beginning of year deferred inflows of resources as OPEB expense	0	0
14. Net amortization of deferred amounts from changes in proportion and differences between employer's contributions and proportionate share of contributions	(1,820)	0
OPEB Expense	($1,820)	($1,820)

EXHIBIT 9

Deferred Outflows of Resources and Deferred Inflows of Resources – Total for all Employers

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$926,006	$899,882
2. Changes of assumptions or other inputs	41,316,634	50,144,975
3. Net excess of projected over actual earnings on OPEB plan investments (if any)	57,129,080	0
4. Difference between actual and expected experience in the Total OPEB Liability	0	0
5. Total Deferred Outflows of Resources	$99,371,720	$51,044,857
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$926,006	$899,882
7. Changes of assumptions or other inputs	9,716,291	0
8. Net excess of actual over projected earnings on OPEB plan investments (if any)	0	147,233,134
9. Difference between expected and actual experience in the Total OPEB Liability	38,710,182	18,390,076
10. Total Deferred Inflows of Resources	$49,352,479	$166,523,092

Deferred outflows of resources and deferred inflows of resources related to OPEB expense will be recognized as follows:

Reporting Date for Employer under GASB 75 Year Ended June 30:		
2019	N/A	($31,217,632)
2020	4,802,405	(31,217,632)
2021	4,802,405	(31,217,632)
2022	4,802,403	(31,217,634)
2023	41,610,687	5,590,651
2024	(2,066,802)	3,801,644
2025	(3,931,857)	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 64 and 65 of GASB 75.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – Alameda County

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$74,606	$0
2. Changes of assumptions or other inputs	31,545,444	38,255,139
3. Net excess of projected over actual earnings on OPEB plan investments (if any)	43,618,321	0
4. Difference between actual and expected experience in the Total OPEB Liability	0	0
5. Total Deferred Outflows of Resources	$75,238,371	$38,255,139
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$470,109	$570,560
7. Changes of assumptions or other inputs	7,418,434	0
8. Net excess of actual over projected earnings on OPEB plan investments (if any)	0	112,322,800
9. Difference between expected and actual experience in the Total OPEB Liability	29,555,406	14,029,619
10. Total Deferred Inflows of Resources	$37,443,949	$126,922,979

Deferred outflows of resources and deferred inflows of resources related to OPEB expense will be recognized as follows:

Reporting Date for Employer under GASB 75 Year Ended June 30:		
2019	N/A	($23,916,095)
2020	$3,579,365	(23,916,095)
2021	3,579,365	(23,916,095)
2022	3,579,364	(23,916,096)
2023	31,682,661	4,164,607
2024	(1,633,161)	2,831,934
2025	(2,993,172)	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 64 and 65 of GASB 75.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – Health System

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$838,503	$899,882
2. Changes of assumptions or other inputs	7,760,201	9,378,317
3. Net excess of projected over actual earnings on OPEB plan investments (if any)	10,730,137	0
4. Difference between actual and expected experience in the Total OPEB Liability	0	0
5. Total Deferred Outflows of Resources	$19,328,841	$10,278,199
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
7. Changes of assumptions or other inputs	1,824,940	0
8. Net excess of actual over projected earnings on OPEB plan investments (if any)	0	27,536,139
9. Difference between expected and actual experience in the Total OPEB Liability	7,270,650	3,439,387
10. Total Deferred Inflows of Resources	$9,095,590	$30,975,526

Deferred outflows of resources and deferred inflows of resources related to OPEB expense will be recognized as follows:

Reporting Date for Employer under GASB 75 Year Ended June 30:		
2019	N/A	($5,680,018)
2020	$1,077,548	(5,680,018)
2021	1,077,548	(5,680,018)
2022	1,077,547	(5,680,019)
2023	7,990,978	1,204,016
2024	(263,343)	818,730
2025	(727,027)	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 64 and 65 of GASB 75.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – Superior Court

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
2. Changes of assumptions or other inputs	1,499,836	1,887,155
3. Net excess of projected over actual earnings on OPEB plan investments (if any)	2,073,844	0
4. Difference between actual and expected experience in the Total OPEB Liability	0	0
5. Total Deferred Outflows of Resources	$3,573,680	$1,887,155
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$334,671	$209,583
7. Changes of assumptions or other inputs	352,711	0
8. Net excess of actual over projected earnings on OPEB plan investments (if any)	0	5,540,969
9. Difference between expected and actual experience in the Total OPEB Liability	1,405,219	692,092
10. Total Deferred Inflows of Resources	$2,092,601	$6,442,644

Deferred outflows of resources and deferred inflows of resources related to OPEB expense will be recognized as follows:

Reporting Date for Employer under GASB 75 Year Ended June 30:		
2019	N/A	($1,211,742)
2020	$108,865	(1,211,742)
2021	108,865	(1,211,742)
2022	108,865	(1,211,742)
2023	1,445,044	173,500
2024	(128,689)	117,979
2025	(161,871)	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 64 and 65 of GASB 75.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – First 5

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$12,897	$0
2. Changes of assumptions or other inputs	156,710	184,873
3. Net excess of projected over actual earnings on OPEB plan investments (if any)	216,685	0
4. Difference between actual and expected experience in the Total OPEB Liability	0	0
5. Total Deferred Outflows of Resources	$386,292	$184,873
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$2,566	$3,114
7. Changes of assumptions or other inputs	36,853	0
8. Net excess of actual over projected earnings on OPEB plan investments (if any)	0	542,815
9. Difference between expected and actual experience in the Total OPEB Liability	146,824	67,800
10. Total Deferred Inflows of Resources	$186,243	$613,729

Deferred outflows of resources and deferred inflows of resources related to OPEB expense will be recognized as follows:

Reporting Date for Employer under GASB 75 Year Ended June 30:		
2019	N/A	($115,640)
2020	$19,942	(115,640)
2021	19,942	(115,640)
2022	19,942	(115,640)
2023	159,552	20,063
2024	(5,938)	13,641
2025	(13,391)	0
Thereafter	0	0

(1) *Calculated in accordance with Paragraphs 64 and 65 of GASB 75.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – Housing Authority

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
2. Changes of assumptions or other inputs	185,883	226,411
3. Net excess of projected over actual earnings on OPEB plan investments (if any)	257,023	0
4. Difference between actual and expected experience in the Total OPEB Liability	0	0
5. Total Deferred Outflows of Resources	$442,906	$226,411
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$25,849	$28,994
7. Changes of assumptions or other inputs	43,713	0
8. Net excess of actual over projected earnings on OPEB plan investments (if any)	0	664,776
9. Difference between expected and actual experience in the Total OPEB Liability	174,157	83,033
10. Total Deferred Inflows of Resources	$243,719	$776,803

Deferred outflows of resources and deferred inflows of resources related to OPEB expense will be recognized as follows:

Reporting Date for Employer under GASB 75 Year Ended June 30:		
2019	N/A	($146,056)
2020	$16,155	(146,056)
2021	16,155	(146,056)
2022	16,155	(146,056)
2023	181,755	20,137
2024	(13,114)	13,695
2025	(17,919)	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 64 and 65 of GASB 75.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – LARPD

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
2. Changes of assumptions or other inputs	168,560	213,080
3. Net excess of projected over actual earnings on OPEB plan investments (if any)	233,070	0
4. Difference between actual and expected experience in the Total OPEB Liability	0	0
5. Total Deferred Outflows of Resources	$401,630	$213,080
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$84,296	$77,296
7. Changes of assumptions or other inputs	39,640	0
8. Net excess of actual over projected earnings on OPEB plan investments (if any)	0	625,635
9. Difference between expected and actual experience in the Total OPEB Liability	157,926	78,145
10. Total Deferred Inflows of Resources	$281,862	$781,076

Deferred outflows of resources and deferred inflows of resources related to OPEB expense will be recognized as follows:

Reporting Date for Employer under GASB 75 Year Ended June 30:		
2019	N/A	($146,261)
2020	$2,350	(146,261)
2021	2,350	(146,261)
2022	2,350	(146,261)
2023	152,517	10,148
2024	(21,322)	6,900
2025	(18,477)	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 64 and 65 of GASB 75.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources – ACOE

Reporting Date for Employer under GASB 75 Measurement Date for Employer under GASB 75	June 30, 2019 December 31, 2018	June 30, 2018 December 31, 2017
Deferred Outflows of Resources		
1. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$0	$0
2. Changes of assumptions or other inputs	0	0
3. Net excess of projected over actual earnings on OPEB plan investments (if any)	0	0
4. Difference between actual and expected experience in the Total OPEB Liability	0	0
5. Total Deferred Outflows of Resources	0	0
Deferred Inflows of Resources		
6. Changes in proportion and differences between employer's contributions and proportionate share of contributions[1]	$8,515	$10,335
7. Changes of assumptions or other inputs	0	0
8. Net excess of actual over projected earnings on OPEB plan investments (if any)	0	0
9. Difference between expected and actual experience in the Total OPEB Liability	0	0
10. Total Deferred Inflows of Resources	$8,515	$10,335

Deferred outflows of resources and deferred inflows of resources related to OPEB expense will be recognized as follows:

Reporting Date for Employer under GASB 75 Year Ended June 30:		
2019	N/A	($1,820)
2020	($1,820)	(1,820)
2021	(1,820)	(1,820)
2022	(1,820)	(1,820)
2023	(1,820)	(1,820)
2024	(1,235)	(1,235)
2025	0	0
Thereafter	0	0

[1] *Calculated in accordance with Paragraphs 64 and 65 of GASB 75.*

EXHIBIT 9 (continued)

Deferred Outflows of Resources and Deferred Inflows of Resources

There are changes in each employer's proportionate share of the total Net OPEB Liability (NOL) during the measurement period ended December 31, 2018. The net effect of the change on the employer's proportionate share of the collective NOL and collective deferred outflows of resources and deferred inflows of resources is recognized over the average of the expected remaining service lives of all employees that are provided with benefits through ACERA which is 6.67[8] years determined as of December 31, 2017 (the beginning of the measurement period ended December 31, 2018). This is described in Paragraph 64 of GASB 75.

The average of the expected service lives of all employees is determined by:

- Calculating each active employee's expected remaining service life as the present value of $1 per year of future service at zero percent interest.
- Setting the remaining service life to zero for each nonactive or retired member.
- Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

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[8] *The remaining service lives of all employees of 6.67 years used here for GASB 75 is different from the 5.43 years used for GASB 68 because the number of payees and nonactive members (with 0 years of expected remaining service lives) receiving health benefits under the SRBR Plan is less than the number of payees and nonactive members receiving pension benefits.*

EXHIBIT 10

Schedule of Proportionate Share of the Net OPEB Liability – Total for all Employers

Reporting Date for Employer under GASB 75 as of June 30	Proportion of the Net OPEB Liability	Proportionate share of Net OPEB Liability	Covered-employee payroll[1]	Proportionate share of the Net OPEB Liability as a percentage of its covered-employee payroll	Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability
2017	100.00%	$135,247,221	$947,567,631	14.27%	85.50%
2018	100.00%	$27,478,286	$995,178,209	2.76%	97.33%
2019	100.00%	$232,896,579	$1,046,033,851	22.26%	77.91%

[1] *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net OPEB Liability – Alameda County

Reporting Date for Employer under GASB 75 as of June 30	Proportion of the Net OPEB Liability	Proportionate share of Net OPEB Liability	Covered-employee payroll[1]	Proportionate share of the Net OPEB Liability as a percentage of its covered-employee payroll	Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability
2017	76.785%	$103,849,869	$670,675,915	15.48%	85.50%
2018	76.289%	$20,962,931	$696,359,743	3.01%	97.33%
2019	76.351%	$177,817,632	$728,698,264	24.40%	77.91%

[1] *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net OPEB Liability – Health System

Reporting Date for Employer under GASB 75 as of June 30	Proportion of the Net OPEB Liability	Proportionate share of Net OPEB Liability	Covered-employee payroll[1]	Proportionate share of the Net OPEB Liability as a percentage of its covered-employee payroll	Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability
2017	17.920%	$24,236,173	$216,685,931	11.18%	85.50%
2018	18.702%	$5,139,101	$239,207,087	2.15%	97.33%
2019	18.782%	$43,743,260	$255,247,270	17.14%	77.91%

[1] *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net OPEB Liability – Superior Court

Reporting Date for Employer under GASB 75 as of June 30	Proportion of the Net OPEB Liability	Proportionate share of Net OPEB Liability	Covered-employee payroll[1]	Proportionate share of the Net OPEB Liability as a percentage of its covered-employee payroll	Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability
2017	3.946%	$5,336,372	$46,866,752	11.39%	85.50%
2018	3.763%	$1,034,117	$46,437,348	2.23%	97.33%
2019	3.630%	$8,454,384	$48,293,563	17.51%	77.91%

[1] *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net OPEB Liability – First 5

Reporting Date for Employer under GASB 75 as of June 30	Proportion of the Net OPEB Liability	Proportionate share of Net OPEB Liability	Covered-employee payroll[1]	Proportionate share of the Net OPEB Liability as a percentage of its covered-employee payroll	Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability
2017	0.371%	$502,287	$4,416,769	11.37%	85.50%
2018	0.369%	$101,306	$4,562,701	2.22%	97.33%
2019	0.379%	$883,354	$4,952,333	17.84%	77.91%

[1] *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net OPEB Liability – Housing Authority

Reporting Date for Employer under GASB 75 as of June 30	Proportion of the Net OPEB Liability	Proportionate share of Net OPEB Liability	Covered-employee payroll[(1)]	Proportionate share of the Net OPEB Liability as a percentage of its covered-employee payroll	Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability
2017	0.477%	$644,757	$4,354,275	14.81%	85.50%
2018	0.452%	$124,068	$4,299,288	2.89%	97.33%
2019	0.450%	$1,047,799	$4,512,036	23.22%	77.91%

(1) *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net OPEB Liability – LARPD

Reporting Date for Employer under GASB 75 as of June 30	Proportion of the Net OPEB Liability	Proportionate share of Net OPEB Liability	Covered-employee payroll[1]	Proportionate share of the Net OPEB Liability as a percentage of its covered-employee payroll	Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability
2017	0.492%	$665,608	$4,487,952	14.83%	85.50%
2018	0.425%	$116,763	$4,312,042	2.71%	97.33%
2019	0.408%	$950,150	$4,330,385	21.94%	77.91%

[1] *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 10 (continued)

Schedule of Proportionate Share of the Net OPEB Liability – ACOE

Reporting Date for Employer under GASB 75 as of June 30	Proportion of the Net OPEB Liability	Proportionate share of Net OPEB Liability	Covered-employee payroll[1]	Proportionate share of the Net OPEB Liability as a percentage of its covered-employee payroll	Plan's Fiduciary Net Position as a percentage of the Total OPEB Liability
2017	0.009%	$12,155	$80,037	15.19%	85.50%
2018	0.000%	$0	$0	N/A	N/A
2019	0.000%	$0	$0	N/A	N/A

[1] *Covered-employee payroll shown represents Compensation Earnable and Pensionable Compensation and is defined as the payroll of employees that are provided with OPEB through the OPEB plan.*

EXHIBIT 11

Schedule of Reconciliation of Net OPEB Liability – Total for all Employers

Reporting Date for Employer under GASB 75	**June 30, 2019**	**June 30, 2018**
Measurement Date for Employer under GASB 75	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net OPEB Liability		
1. Beginning Net OPEB Liability	$27,478,286	$135,247,221
2. OPEB Expense	39,920,817	7,709,300
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	134,279,844	(115,478,235)
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	0
6. New Net Deferred Flows Due to Change in Proportion	0	0
7. Recognition of Prior Deferred Inflows/Outflows	31,217,632	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	0	0
9. Ending Net OPEB Liability	$232,896,579	$27,478,286

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net OPEB Liability – Alameda County

Reporting Date for Employer under GASB 75	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 75	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net OPEB Liability		
1. Beginning Net OPEB Liability	$20,962,931	$103,849,869
2. OPEB Expense	30,392,439	5,780,902
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	102,523,290	(88,097,280)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(70,894)	0
6. New Net Deferred Flows Due to Change in Proportion	74,606	(570,560)
7. Recognition of Prior Deferred Inflows/Outflows	23,834,809	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	100,451	0
9. Ending Net OPEB Liability	$177,817,632	$20,962,931

EXHIBIT 11 (continued)
Schedule of Reconciliation of Net OPEB Liability – Health System

Reporting Date for Employer under GASB 75	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 75	December 31, 2018	December 31, 2017
Reconciliation of Net OPEB Liability		
1. Beginning Net OPEB Liability	$5,139,101	$24,236,173
2. OPEB Expense	7,673,581	1,600,255
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	25,220,801	(21,597,209)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(92,223)	0
6. New Net Deferred Flows Due to Change in Proportion	97,051	899,882
7. Recognition of Prior Deferred Inflows/Outflows	5,863,379	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	(158,430)	0
9. Ending Net OPEB Liability	$43,743,260	$5,139,101

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net OPEB Liability – Superior Court

Reporting Date for Employer under GASB 75	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 75	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net OPEB Liability		
1. Beginning Net OPEB Liability	$1,034,117	$5,336,372
2. OPEB Expense	1,383,699	253,234
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	4,874,496	(4,345,906)
5. Change in Allocation of Prior Deferred Inflows/Outflows	153,928	0
6. New Net Deferred Flows Due to Change in Proportion	(161,986)	(209,583)
7. Recognition of Prior Deferred Inflows/Outflows	1,133,232	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	36,898	0
9. Ending Net OPEB Liability	$8,454,384	$1,034,117

EXHIBIT 11 (continued)
Schedule of Reconciliation of Net OPEB Liability – First 5

Reporting Date for Employer under GASB 75	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 75	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net OPEB Liability		
1. Beginning Net OPEB Liability	$101,306	$502,287
2. OPEB Expense	153,143	27,875
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	509,310	(425,742)
5. Change in Allocation of Prior Deferred Inflows/Outflows	(12,256)	0
6. New Net Deferred Flows Due to Change in Proportion	12,897	(3,114)
7. Recognition of Prior Deferred Inflows/Outflows	118,406	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	548	0
9. Ending Net OPEB Liability	$883,354	$101,306

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net OPEB Liability – Housing Authority

Reporting Date for Employer under GASB 75	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 75	December 31, 2018	December 31, 2017
Reconciliation of Net OPEB Liability		
1. Beginning Net OPEB Liability	$124,068	$644,757
2. OPEB Expense	174,152	29,703
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	604,124	(521,398)
5. Change in Allocation of Prior Deferred Inflows/Outflows	1,863	0
6. New Net Deferred Flows Due to Change in Proportion	(1,960)	(28,994)
7. Recognition of Prior Deferred Inflows/Outflows	140,447	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	5,105	0
9. Ending Net OPEB Liability	$1,047,799	$124,068

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net OPEB Liability – LARPD

Reporting Date for Employer under GASB 75	June 30, 2019	June 30, 2018
Measurement Date for Employer under GASB 75	**December 31, 2018**	**December 31, 2017**
Reconciliation of Net OPEB Liability		
1. Beginning Net OPEB Liability	$116,763	$665,608
2. OPEB Expense	145,623	19,151
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	547,823	(490,700)
5. Change in Allocation of Prior Deferred Inflows/Outflows	19,582	0
6. New Net Deferred Flows Due to Change in Proportion	(20,608)	(77,296)
7. Recognition of Prior Deferred Inflows/Outflows	127,359	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	13,608	0
9. Ending Net OPEB Liability	$950,150	$116,763

EXHIBIT 11 (continued)

Schedule of Reconciliation of Net OPEB Liability – ACOE

Reporting Date for Employer under GASB 75 **Measurement Date for Employer under GASB 75**	**June 30, 2019** **December 31, 2018**	**June 30, 2018** **December 31, 2017**
Reconciliation of Net OPEB Liability		
1. Beginning Net OPEB Liability	$0	$12,155
2. OPEB Expense	(1,820)	(1,820)
3. Employer Contributions	0	0
4. New Net Deferred Inflows/Outflows	0	0
5. Change in Allocation of Prior Deferred Inflows/Outflows	0	0
6. New Net Deferred Flows Due to Change in Proportion	0	(10,335)
7. Recognition of Prior Deferred Inflows/Outflows	0	0
8. Recognition of Prior Deferred Flows Due to Change in Proportion	1,820	0
9. Ending Net OPEB Liability	$0	$0

EXHIBIT 12

Schedule of Recognition of Changes in Total Net OPEB Liability

Increase (Decrease) in OPEB Expense Arising from the Recognition of the Effects of Differences between Actual and Expected Experience on Total OPEB Liability

Reporting Date for Employer under GASB 75 Year Ended June 30	Differences Between Actual and Expected Experience	Recognition Period (Years)	Reporting Date for Employer under GASB 75, Year Ended June 30: 2018	2019	2020	2021	2022	2023	2024	2025
2018	($21,627,766)	6.68	($3,237,690)	($3,237,690)	($3,237,690)	($3,237,690)	($3,237,690)	($3,237,690)	($2,201,626)	$0
2019	($27,712,610)	6.67	N/A	(4,154,814)	(4,154,814)	(4,154,814)	(4,154,814)	(4,154,814)	(4,154,814)	(2,783,726)
Net increase (decrease) in OPEB expense			($3,237,690)	($7,392,504)	($7,392,504)	($7,392,504)	($7,392,504)	($7,392,504)	($6,356,440)	($2,783,726)

Increase (Decrease) in OPEB Expense Arising from the Recognition of the Effects of Assumption Changes

Reporting Date for Employer under GASB 75 Year Ended June 30	Effect of Assumption Changes	Recognition Period (Years)	Reporting Date for Employer under GASB 75, Year Ended June 30: 2018	2019	2020	2021	2022	2023	2024	2025
2018	$58,973,316	6.68	$8,828,341	$8,828,341	$8,828,341	$8,828,341	$8,828,341	$8,828,341	$6,003,270	$0
2019	($11,429,923)	6.67	N/A	(1,713,632)	(1,713,632)	(1,713,632)	(1,713,632)	(1,713,632)	(1,713,632)	(1,148,131)
Net increase (decrease) in OPEB expense			$8,828,341	$7,114,709	$7,114,709	$7,114,709	$7,114,709	$7,114,709	$4,289,638	($1,148,131)

As described in Exhibit 9, the average of the expected remaining service lives of all employees that are provided with benefits through ACERA (active and inactive employees) determined as of December 31, 2017 (the beginning of the measurement period ending December 31, 2018) is 6.67 years.

EXHIBIT 12 (continued)

Schedule of Recognition of Changes in Total Net OPEB Liability

Increase (Decrease) in OPEB Expense Arising from the Recognition of Differences between Projected and Actual Earnings on OPEB Plan Investments

Reporting Date for Employer under GASB 75 Year Ended June 30	Differences between Projected and Actual Earnings	Recognition Period (Years)	Reporting Date for Employer under GASB 75, Year Ended June 30					
			2018	2019	2020	2021	2022	2023
2018	($184,041,417)	5.00	($36,808,283)	($36,808,283)	($36,808,283)	($36,808,283)	($36,808,283)	$0
2019	$209,442,414	5.00	N/A	41,888,483	41,888,483	41,888,483	41,888,483	41,888,482
Net increase (decrease) in OPEB expense			($36,808,283)	$5,080,200	$5,080,200	$5,080,200	$5,080,200	$41,888,482

The differences between projected and actual earnings on OPEB plan investments are recognized over a five-year period per Paragraph 43b. of GASB 75.

Total Increase (Decrease) in OPEB Expense

Reporting Date for Employer under GASB 75 Year Ended June 30	Total Differences	Reporting Date for Employer under GASB 75, Year Ended June 30							
		2018	2019	2020	2021	2022	2023	2024	2025
2018	($146,695,867)	($31,217,632)	($31,217,632)	($31,217,632)	($31,217,632)	($31,217,634)	$5,590,651	$3,801,644	$0
2019	$170,299,881	N/A	36,020,037	36,020,037	36,020,037	36,020,037	36,020,036	(5,868,446)	(3,931,857)
Net increase (decrease) in OPEB expense		($31,217,632)	$4,802,405	$4,802,405	$4,802,405	$4,802,403	$41,610,687	($2,066,802)	($3,931,857)

EXHIBIT 13

Allocation of Changes in Total Net OPEB Liability

In addition to the amounts shown in Exhibit 12, there are changes in each employer's proportionate share of the total Net OPEB Liability (NOL) during the measurement period ending on December 31, 2018 and December 31, 2017. The net effect of the change on the employer's proportionate share of the collective NOL and collective deferred outflows of resources and deferred inflows of resources is also recognized over the average of the expected remaining service lives of all employees shown previously. These amounts are shown below. While these amounts are different for each employer, they sum to zero for ACERA.

Increase (Decrease) in OPEB Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Reporting Year Ended June 30, 2019

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GASB 75, Year Ended June 30						
			2019	2020	2021	2022	2023	2024	2025
Alameda County	$87,763	6.67	$13,157	$13,157	$13,157	$13,157	$13,157	$13,157	$8,821
Health System	114,168	6.67	17,117	17,117	17,117	17,117	17,117	17,117	11,466
Superior Court	(190,555)	6.67	(28,569)	(28,569)	(28,569)	(28,569)	(28,569)	(28,569)	(19,141)
First 5	15,172	6.67	2,275	2,275	2,275	2,275	2,275	2,275	1,522
Housing Authority	(2,306)	6.67	(346)	(346)	(346)	(346)	(346)	(346)	(230)
LARPD	(24,242)	6.67	(3,634)	(3,634)	(3,634)	(3,634)	(3,634)	(3,634)	(2,438)
ACOE	0	6.67	0	0	0	0	0	0	0
Total for all Employers	$0		$0	$0	$0	$0	$0	$0	$0

EXHIBIT 13 (continued)

Allocation of Changes in Total Net OPEB Liability

Increase (Decrease) in OPEB Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Reporting Year Ended June 30, 2018

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GASB 75, Year Ended June 30						
			2018	2019	2020	2021	2022	2023	2024
Alameda County	($671,011)	6.68	($100,451)	($100,451)	($100,451)	($100,451)	($100,451)	($100,451)	($68,305)
Health System	1,058,312	6.68	158,430	158,430	158,430	158,430	158,430	158,430	107,732
Superior Court	(246,481)	6.68	(36,898)	(36,898)	(36,898)	(36,898)	(36,898)	(36,898)	(25,093)
First 5	(3,662)	6.68	(548)	(548)	(548)	(548)	(548)	(548)	(374)
Housing Authority	(34,099)	6.68	(5,105)	(5,105)	(5,105)	(5,105)	(5,105)	(5,105)	(3,469)
LARPD	(90,904)	6.68	(13,608)	(13,608)	(13,608)	(13,608)	(13,608)	(13,608)	(9,256)
ACOE	(12,155)	6.68	(1,820)	(1,820)	(1,820)	(1,820)	(1,820)	(1,820)	(1,235)
Total for all Employers	$0		$0	$0	$0	$0	$0	$0	$0

Actuarial Assumptions and Actuarial Cost Method
For December 31, 2018 Measurement Date and Employer Reporting as of June 30, 2019

Data: Detailed census data and summary plan descriptions for postretirement benefits were provided by ACERA.

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 December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017, and in our letter dated March 16, 2019 regarding the health trend assumptions for the December 31, 2018 SRBR retiree health actuarial valuation. Unless otherwise noted, all actuarial assumptions and methods shown below apply to all tiers. These assumptions were adopted by the Board.

Post-Retirement Mortality Rates - Healthy

General Members and All Beneficiaries: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected generationally with the two-dimensional MP-2016 projection scale.

Safety Members: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, with no setback for males and females, projected generationally with the two-dimensional MP-2016 projection scale.

Post-Retirement Mortality Rates - Disabled

General Members: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set forward seven years for males and set forward four years for females, projected generationally with the two-dimensional MP-2016 projection scale.

Safety Members: Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set forward two years for males and with no set forward for females, projected generationally with the two-dimensional MP-2016 projection scale.

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

Pre-Retirement Mortality Rates

General and Safety Members: Headcount-Weighted RP-2014 (RPH-2014) Employee Mortality Tables times 80%, projected generationally with the two-dimensional MP-2016 projection scale.

Termination Rates Before Retirement[1]:

	Rate (%) Mortality			
	General[2]		Safety[2]	
Age	**Male**	**Female**	**Male**	**Female**
25	0.05	0.02	0.05	0.02
30	0.05	0.02	0.05	0.02
35	0.05	0.03	0.05	0.03
40	0.06	0.04	0.06	0.04
45	0.10	0.07	0.10	0.07
50	0.17	0.11	0.17	0.11
55	0.27	0.17	0.27	0.17
60	0.48	0.24	0.45	0.24
65	0.78	0.36	0.78	0.36

(1) Note that generational projections beyond the base year (2014) are not reflected in the above mortality rates. All pre-retirement deaths are assumed to be non-service connected.

(2) Based on the Headcount-Weighted RP-2014 (RPH-2014) Employee Mortality Tables times 80%, projected generationally with the two-dimensional MP-2016 projection scale.

Termination Rates Before Retirement (continued):

	Rate (%) Disability	
Age	**General[1]**	**Safety[2]**
20	0.00	0.00
25	0.01	0.03
30	0.03	0.26
35	0.05	0.58
40	0.08	0.73
45	0.19	0.78
50	0.31	1.52
55	0.38	2.00
60	0.43	2.60

(1) 60% of General disabilities are assumed to be service connected disabilities. The other 40% are assumed to be non-service connected disabilities.

(2) 100% of Safety disabilities are assumed to be service connected disabilities.

Termination Rates Before Retirement (continued):

	Rate (%)	
	Termination (< 5 Years of Service)[1]	
Years of Service	General	Safety
0	11.00	4.00
1	9.00	3.50
2	8.00	3.50
3	6.00	2.50
4	6.00	2.00

	Termination (5+ Years of Service)[2]	
Age	General	Safety
20	6.00	2.00
25	6.00	2.00
30	5.40	2.00
35	4.40	1.70
40	3.40	1.20
45	3.00	1.00
50	3.00	1.00
55	3.00	1.00
60	3.00	0.40

(1) 60% of terminated members will choose a refund of contributions and 40% will choose a deferred vested benefit.

(2) 35% of terminated members will choose a refund of contributions and 65% will choose a deferred vested benefit. No termination is assumed after a member is eligible for retirement (as long as a retirement rate is present).

Retirement Rates:

	Rate (%)							
Age	General Tier 1	General Tier 2	General Tier 3	General Tier 4	Safety Tier 1(1)	Safety Tier 2, 2D(1)	Safety Tier 2C(1)	Safety Tier 4
49	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
50	4.00	2.00	6.00	0.00	35.00	15.00	4.00	4.00
51	4.00	2.00	3.00	0.00	30.00	15.00	2.00	2.00
52	4.00	2.00	5.00	4.00	25.00	15.00	2.00	2.00
53	4.00	2.00	6.00	1.50	35.00	15.00	3.00	3.00
54	4.00	2.00	6.00	1.50	45.00	15.00	6.00	6.00
55	6.00	2.00	12.00	2.00	45.00	15.00	10.00	10.00
56	8.00	3.00	13.00	2.50	45.00	15.00	12.00	12.00
57	10.00	4.00	13.00	3.50	45.00	15.00	20.00	20.00
58	12.00	4.00	14.00	3.50	45.00	20.00	10.00	10.00
59	14.00	5.00	16.00	4.50	45.00	20.00	15.00	15.00
60	20.00	7.00	21.00	6.00	45.00	30.00	60.00	60.00
61	20.00	9.00	20.00	8.00	45.00	30.00	60.00	60.00
62	35.00	15.00	30.00	18.00	45.00	30.00	60.00	60.00
63	30.00	16.00	25.00	15.00	45.00	30.00	60.00	60.00
64	30.00	18.00	25.00	17.00	45.00	50.00	60.00	60.00
65	35.00	25.00	30.00	22.00	100.00	100.00	100.00	100.00
66	35.00	25.00	25.00	25.00	100.00	100.00	100.00	100.00
67	30.00	25.00	25.00	25.00	100.00	100.00	100.00	100.00
68	30.00	30.00	25.00	30.00	100.00	100.00	100.00	100.00
69	35.00	35.00	50.00	35.00	100.00	100.00	100.00	100.00
70	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
71	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
72	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
73	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
74	65.00	50.00	65.00	50.00	100.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

(1) Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.

Retirement Age and Benefit for Deferred Vested Members:	For deferred vested members, retirement age assumptions are as follows: General Age: 61 Safety Age: 56 For future deferred vested members who terminate with less than five years of service and who are not vested, we assume that they will retire at age 70 for both General and Safety if they decide to leave their contributions on deposit. We assume that 30% of future General and 60% of future Safety deferred vested members will continue to work for a reciprocal employer. For reciprocals, we assume 3.90% and 4.30% compensation increases per annum for General and Safety, respectively.
Measurement Date:	December 31, 2018
Discount Rate:	7.25%
Future Benefit Accruals:	1.0 year of service per year of employment plus 0.003 year of additional service for General members and 0.006 year of additional service for Safety members, to anticipate conversion of unused sick leave for each 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.
Consumer Price Index:	Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 3% maximum change per year for General Tier 1, General Tier 3, and Safety Tier 1 and 2% maximum change per year for General Tier 2, General Tier 4, Safety Tier 2, Safety Tier 2C, Safety Tier 2D, and Safety Tier 4.
Actuarial Cost Method:	Entry Age Cost Method.

Salary Increases:

Annual Rate of Compensation Increase (%)

Inflation: 3.00%; an additional 0.50% "across the board" salary increases (other than inflation); plus the following Merit and Promotional increases based on service.

Service	General	Safety
0-1	4.80%	7.80%
1-2	4.80	7.80
2-3	3.90	7.00
3-4	2.40	4.40
4-5	1.90	3.50
5-6	1.60	2.30
6-7	1.50	1.60
7-8	1.10	1.00
8-9	0.80	1.00
9-10	0.80	0.90
10-11	0.50	0.80
11+	0.40	0.80

Terminal Pay Assumptions: Additional pay elements are expected to be received during a member's final average earnings period. The percentages, added to the final year salary, used in this valuation are:

	Service Retirement	Disability Retirement
General Tier 1	8.0%	6.5%
General Tier 2	3.0%	1.4%
General Tier 3	8.0%	6.5%
General Tier 4	N/A	N/A
Safety Tier 1	8.5%	6.4%
Safety Tier 2	3.5%	2.1%
Safety Tier 2C	3.5%	2.1%
Safety Tier 2D	3.5%	2.1%
Safety Tier 4	N/A	N/A

Per Capita Health Costs:

The combined monthly per capita dental and vision claims cost for plan year 2018 was assumed to be $47.91. The monthly Medicare Part B premium reimbursement for 2018 is $134.00. For calendar year 2018, medical costs for a retiree were assumed to be as follows:

Medical Plan[1]	Election Assumption	Monthly Premium	Maximum Monthly Medical Allowance[2]
Under Age 65[3]			
Kaiser HMO	90%	$735.64	$540.44
United Healthcare HMO	10%	$1,047.16	$540.44
Age 65 and Older			
Kaiser Senior Advantage	70%	$367.23	$540.44
Via Benefits Individual Insurance Exchange	30%	$291.39[4]	$414.00

(1) There are other plans available to retirees under 65 that have a range of premiums and include Via Benefits individual insurance coverage for retirees residing outside of ACERA medical plans' coverage area. We have assumed that these current retirees will draw the Maximum Monthly Subsidy ($540.44) and 0% of future retirees will enroll in these other plans.

(2) The Maximum Monthly Medical Allowance of $540.44 ($414.00 for retirees purchasing individual insurance from the Medicare exchange) is subject to the following subsidy schedule:

Completed Years of Service	Percentage Subsidized
10-14	50%
15-19	75%
20+	100%

(3) Current retirees under 65 are assumed to elect medical plans in the same proportion as future retirees upon age 65.

(4) The derivation of amount expected to be paid out in 2018 from the Health Reimbursement Account for members with 20 or more years of service is provided in the table on the following page. In the table, we have also provided the amount expected to be paid for members with 10-14 and 15-19 years of service.

Per Capita Health Costs (continued): Derivation of Via Benefits Monthly Per Capita Costs

	(Years of Service Category)	10-14	15-19	20+
1.	Maximum MMA for 2017	$207.00	$310.50	$414.00
2.	Total of Maximum MMA (From Jan. 2017 to Dec. 2017)	$424,764	$708,026	$4,423,203
3.	Total of Actual Reimbursement (From Jan. 2017 to Dec. 2017)	$317,422	$503,498	$2,657,446
4.	Ratio of Actual Reimbursement to Maximum 2017 MMA [(3) / (2)]	74.73%	71.11%	60.08%
5.	Average Monthly Per Capita Cost for 2017 [(1) x (4)]	$154.69	$220.80	$248.73
6.	Increased for Expected Medical Trend (6.50%) from 2017 to 2018 [(5) x 1.065]	$164.74	$235.16	$264.90
7.	Increased for Additional 10% Margin for 2017 Expenses Incurred in 2017 but Reimbursed after December 2017 [(6) x 1.10]	**$181.22**	**$258.67**	**$291.39**

Per Capita Health Costs (continued): Implicit Subsidy

We have estimated the average per capita premium for retirees under age 65 to be $9,202 per year. Because premiums for retirees under age 65 include active participants for purposes of underwriting, the retirees receive an implicit subsidy from the actives. Had the retirees under age 65 been underwritten as a separate group, their age-based premiums would be higher for most individuals. The excess of the age-based premium over the per capita premium charged makes up the subsidy. Below is a sample of the age-based costs for the retirees under age 65.

Average Medical

	Retiree		Spouse	
Age	**Male**	**Female**	**Male**	**Female**
50	$10,099	$11,504	$7,054	$9,237
55	11,994	12,383	9,440	10,692
60	14,244	13,348	12,637	12,400
64	16,342	14,160	15,953	13,957

Not all ACERA employers are receiving an implicit subsidy reimbursement from the Association. For SRBR sufficiency purposes, we have adjusted (by about a 12% reduction of the costs shown above) our projected implicit subsidy payments to account for this fact, based on data provided by the County of Alameda's health consultant.

For calculating the Actuarial Present Value of Projected Benefits and Actuarial Accrued Liability, we have not applied the adjustment.

Participation and Coverage Election:

Retired members and beneficiaries as of valuation date:

MMA	**Under Age 65**	**Upon Attaining Age 65**
MMA on Record		
Current Retirees Under 65 on Valuation Date	100%	100% and assumed to choose carrier in same proportion as future retirees
Current Retirees 65 and Over on Valuation Date	N/A	100%
No MMA on Record		
Less than 10 Years of Service	0%	0%
10+ Years of Service		
Current Retirees Under 65 on Valuation Date	0%	50%
Current Retirees 65 and Over on Valuation Date	N/A	0%

Medicare Part B Premium Subsidy	**Under Age 65**	**Upon Attaining Age 65**
MMA on Record		
Current Retirees Under 65 on Valuation Date	N/A	100%
Current Retirees 65 and Over on Valuation Date	N/A	100% if Part B reimbursement on record or purchasing individual insurance from the Medicare exchange
No MMA on Record		
Less than 10 Years of Service	N/A	0%
10+ Years of Service		
Current Retirees Under 65 on Valuation Date	N/A	50%
Current Retirees 65 and Over on Valuation Date	N/A	0%

Implicit Subsidy	Current retirees, married dependents and surviving beneficiaries under age 65 and enrolled in an ACERA non-Medicare plan are assumed to have an implicit subsidy liability.
Dental and Vision Subsidy	Current retirees not self-paying ("Voluntary" or "Under 10 YOS" dental or vision code).

Active and inactive vested members as of the valuation date:

	Under Age 65	Upon Attaining Age 65
Medical Plan Subsidy (i.e., MMA)	80% of eligible members.	90% of eligible members.

	Under Age 65	Upon Attaining Age 65
Part B Subsidy	80% of eligible members.	90% of eligible members.

Implicit Subsidy	80% of eligible members under age 65 are assumed to have an implicit subsidy liability.
Dental and Vision Subsidy	100% of eligible members.

Health Care Cost Trend Rates: Health care trend measures the anticipated overall rate at which health plan costs are expected to increase in future years. The rates shown below are "net" and are applied to the net per capita costs shown above. The trend shown for a particular plan year is the rate that is to be applied to the premium for the shown calendar year to calculate the next calendar year's projected premium. For example, the projected 2019 calendar year premium for Kaiser (under age 65) is $765.06 per month ($735.64 increased by 4.0%).

	Non-Medicare Plans	**Medicare Advantage Plan**	**Dental, Vision and Medicare Part B**	
Calendar Year	United Healthcare HMO & Kaiser HMO Early Retiree	Via Benefits & Kaiser Senior Advantage	Dental and Vision	Medicare Part B
2018	7.00%(1)	6.50%(1)	4.50%(1)	4.50%(2)
2019	7.00(3)	6.50%(3)	4.00	4.00
2020	6.75	6.25	4.00	4.00
2021	6.50	6.00	4.00	4.00
2022	6.25	5.75	4.00	4.00
2023	6.00	5.50	4.00	4.00
2024	5.75	5.25	4.00	4.00
2025	5.50	5.00	4.00	4.00
2026	5.25	4.75	4.00	4.00
2027	5.00	4.50	4.00	4.00
2028	4.75	4.50	4.00	4.00
2029 & Later	4.50	4.50	4.00	4.00

(1) The actual trends are shown below, based on premium renewals for 2019 as reported by ACERA.

Kaiser HMO Early Retiree	United Healthcare HMO Early Retiree	Kaiser Senior Advantage	Dental and Vision
4.00%	0.00%	8.13%	1.00%

(2) Based on the 3.00% inflation assumption used in the pension valuation, we expect the Social Security COLA from 2018 to 2019 will be large enough to cover the dollar increases in the Medicare Part B premium for most retirees. We assume that the standard premium for all retirees in 2019 will be $140 ($134 in 2018 increased by 4.50%) per month.

(3) In addition, we will further adjust the 2019 non-Medicare trend by 1.20% and the 2019 Medicare trend by 0.90% to reflect the impact of the Health Insurance Tax (HIT).

Assumed Increase in Annual Maximum Benefits:	For the "substantive plan design" shown in this report, we have assumed: a) Maximum medical allowance for 2019 will increase to $558.00 per month, then increase with 50% of trend for medical plans, or 3.125%, graded down to the ultimate rate of 2.25% over 7 years. b) Dental and vision premium reimbursement will increase with full trend. c) Medicare B premium reimbursement will increase with full trend.
Dependents:	Demographic data was available for spouses of current retirees. For future retirees, husbands were assumed to be three years older than their wives. Of the future retirees who elect to continue their medical coverage at retirement, 35% males and 15% females were assumed to have an eligible spouse who also opts for health coverage at that time. Please note that these assumptions are only used to determine the cost of the implicit subsidy.
Plan Design:	Development of plan liabilities was based on the plan of benefits in effect as described in Exhibit 1.
Administrative Expenses:	An administrative expense load was not added to projected incurred claim costs in developing per capita health costs.
Missing Participant Data:	Any missing census items for a given participant was set to equal to the average value of that item over all other participants of the same membership status for whom the item is known.

APPENDIX A

Projection of OPEB Plan's Fiduciary Net Position for Use in Calculation of Discount Rate as of December 31, 2018 ($ in millions)

Year Beginning January 1,	Projected Beginning OPEB Plan's Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending OPEB Plan's Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
2018	$1,002	$0	$41	$1	-$138	$821
2019	821	0	53	1	58	825
2020	825	0	57	1	58	825
2021	825	0	61	1	58	821
2022	821	0	65	1	57	812
2023	812	0	69	1	56	799
2024	799	0	74	1	55	779
2025	779	0	78	1	54	754
2026	754	0	82	1	52	723
2027	723	0	86	1	49	686
2028	686	0	89	1	46	642
2029	642	0	93	1	43	591
2030	591	0	97	1	39	533
2031	533	0	101	1	35	466
2032	466	0	104	1	30	391
2033	391	0	108	0 *	24	307
2034	307	0	111	0 *	18	213
2035	213	0	114	0 *	11	110
2036	110	0	114	0 *	4	0
2037	0	0	0	0	0	0
2038	0	0	0	0	0	0
2039	0	0	0	0	0	0
2040	0	0	0	0	0	0
2132	0	0	0	0	0	0
2133	0	0	0	0	0	0
2133	Discounted Value: 0					

* *Less than $1 M, when rounded.*

APPENDIX A (continued)

Projection of OPEB Plan's Fiduciary Net Position for Use in Calculation of Discount Rate as of December 31, 2018 ($ in millions) - continued

Notes:

(1) Amounts may not total exactly due to rounding.

(2) Amounts shown in the year beginning January 1, 2018 row are actual amounts, based on the financial statements provided by ACERA.

(3) Years 2041 - 2131 have been omitted from this table.

(4) Column (a): Except for the "discounted value" shown for 2133, all of the projected beginning Plan's Fiduciary Net Position amounts shown have not been adjusted for the time value of money.

(5) Column (b): $0. Benefits are funded by employer contributions to the 401(h) account and similar amounts are transferred from the SRBR to the Employers Advance Reserve to backfill the employer contributions that would have otherwise been made to the Retirement Plan.

(6) Column (c): Projected benefit payments have been determined in accordance with paragraph 43-47 of GASB Statement No. 74, and are based on the closed group of active, inactive vested, retired members, and beneficiaries as of November 30, 2017. The projected benefit payments reflect future health care trends. The projected benefit payments include the OPEB SRBR benefits to the extent the current OPEB SRBR (including the portion of deferred investment loss as of December 31, 2018 that is expected to be allocated to the SRBR) supports those benefits*. Benefit payments are assumed to occur halfway through the year, on average. In accordance with paragraph 35 b.(2)(e) of GASB Statement No. 74, the long-term expected rate of return on Plan investments of 7.25% per annum was applied to all periods of projected benefit payments to determine the discount rate.

(7) Column (d): Projected administrative expenses are calculated as approximately 0.12% of the beginning OPEB SRBR Plan's Fiduciary Net Position amount. The 0.12% portion was based on the actual fiscal year 2018 administrative expenses as a percentage of the beginning OPEB SRBR Plan's Fiduciary Net Position amount as of January 1, 2018. Administrative expenses are assumed to occur halfway through the year, on average.

(8) Column (e): Projected investment earnings are based on the assumed investment rate of return of 7.25% per annum.

(9) As illustrated in this Exhibit, the OPEB SRBR Plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.25% per annum was applied to all periods of projected benefit payments to determine the total OPEB liability as of December 31, 2018 shown earlier in this report, pursuant to paragraph 48 of GASB Statement No. 74.

* See discussion on page ii regarding source of funding for payment of OPEB SRBR benefits not covered by current OPEB Plan's Fiduciary Net Position in the SRBR.

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MEMORANDUM TO THE AUDIT COMMITTEE

DATE: June 20, 2019

TO: Members of the Audit Committee

FROM: Harsh Jadhav, Chief of Internal Audit

SUBJECT: 2019 Internal Audit Program

Executive Summary

The Internal Audit Department is in the process of conducting five internal audits and completing the Alameda Health System (AHS) and Superior Courts employer audits. The Alameda Health System (AHS) employer audit is slightly behind the plan, but we expect to recover and complete it by Q4 2019. Similarly, we expect to extend the employer audit for the Superior Courts to Q4 2019, since the employer is engaged in implementing a new system.

The internal audits are on track, and we are excited to report the recent launch of the Vendor and Taxing Authority Overpayment Audit, which is a continuation of the series of benefit underpayment and overpayment audits performed over the last few years. In addition, staff has been involved with several internal initiatives in both an audit and consulting capacity for fraud training, performing a cyber insurance review, and preventing benefit overpayments. We have completed the Watchlist Audit Report and will present the findings at the June Audit Committee meeting. We want to thank both our Investment Staff and Verus (Investment Consultant) for their valuable input and feedback during the audit.

Update on the Employer Audit Strategy

Participating Employer	2014	2015	2016	2017	2018	2019
Alameda County			X			
Superior Courts of California						X
Alameda Health System				X →	→	→
First 5 Alameda County	X					
Housing Authority of the County of Alameda		X				
Livermore Area Recreation and Park District	X					

The Internal Audit Department is still in the report writing phase for the Alameda Health System audit. In addition, we are in the middle of the testing phase for the employer audit for the County of Alameda, Superior Courts, but expect to extend the audit through Q4 2019, so we can understand the reporting capabilities of their new system and provide the employer with the design requirements for the PEPRA specific reporting. We want to extend our thanks to both participating employers for their excellent cooperation

2019 Audit Plan

Internal Audit Program (2019)	Service Line	Assigned	Status	Q1	Q2	Q3	Q4
Medical Part B Premium Reimbursement (MBRP) Audit	Internal Audit	Lyndon	Started				
Underpayments/Overpayments (Vendor Payments) Audit	Internal Audit	Lyndon	Started				
Investment Watchlist Audit	Internal Audit	Harsh	Complete				
Cybersecurity and Data Security Review	Internal Audit	Harsh	Ongoing				
30 Year Membership Verification Audit	Internal Audit	Harsh	Not Started				
Employer Audit Testing/Report - Alameda Health System	Employer Audit	Caxton	Delayed				
Employer Audit Testing/Report - Superior Courts	Employer Audit	Caxton	Started				
2019 Annual Internal Audit Risk Assessment	Administration	Harsh	Complete				
2020 Annual Internal Audit Risk Assessment	Administration	Harsh	Not Started				
Actuarial Data Conversion	Administration	Lyndon	Not Started				
Implement Fraud Hotline	Special Project	Lyndon	Delayed				
Data Analytics Training for Staff	Special Project	Lyndon	Not Started				
Fraud Training for Staff	Special Project	Caxton/Lyndon	Started				

2019 Internal Audit Program

Internal Audits

Audit – Medical Part B Premium Reimbursement (MBRP)
The objective of this audit is to ensure the monthly medical allowance (specifically related to the Medicare Benefit Reimbursement Plan) is paid to eligible retirees.

Audit - Underpayment and Overpayment Audits (Vendor and Taxing Authority Payments)
The objective of this audit is to ensure business processes are in place and effective in preventing and recovering overpayments made to healthcare vendors and government taxing authorities. The review will include a walk-through of the business processes to determine how overpayments occur, the internal controls in place to mitigate overpayments, and the recovery process.

Audit – Investment Watchlist Audit
The objective of this audit is to review the Investment Department's procedures for monitoring fund managers based on the criteria listed in the General Investment Guidelines, Policies, and Procedures. Our focus will be to assess whether the internal controls were designed effectively to ensure performance decisions related to the Watchlist, Probation, and Termination status, were made in accordance with the policy and established procedures.

Audit – Cybersecurity Review and Data Security
The objective of this review will be to work with the PRISM Department to determine if adequate firewall, access controls, employee training, and processes for incident response, business recovery, and threat analysis are in place to ensure sensitive organizational data and member data are protected and secure.

Audit – 30-Year Membership Verification
The objective of this audit is to verify members granted 30-Year Membership have met the requirements for contributions to stop after 30 years of service credit. The scope of work will include reciprocity, membership entry dates for both safety and general members, and membership tiers.

Employer Audits

Audit – PEPRA Employer Audit of Alameda Health System
The employer audit of the Alameda Health System will assess the participating employer's compliance with state laws, rules, regulations and administrative policies regarding the enrollment of members, reporting of member data, and the reporting and remittance of employer contributions in accordance with the Public Employees' Pension Reform Act of 2013.

Audit – PEPRA Employer Audit of Superior Courts of California
The employer audit of Superior Courts of California will assess the participating employer's compliance with state laws, rules, regulations and administrative policies regarding the enrollment of members, reporting of member data, and the reporting and remittance of employer contributions in accordance with the Public Employees' Pension Reform Act of 2013.

Special Projects

Data Analytics Training
Internal Audit staff plans to hold internal training sessions to educate ACERA staff on various technology tools and processes to improve the use of data analytics for business decision making.

Fraud Training
Internal Audit staff is developing a fraud awareness program to educate team members on anti-fraud activities that can reduce the cost of fraud within the organization. The training will cover fraud areas related to lack of segregation of duties, unauthorized use of data, operations, financial transactions, and theft.

Fraud Hotline
As part of their annual fraud assessment, the external auditor recommended for ACERA to implement a Financial Fraud Hotline. We are expecting the hotline to be functional by Q3 2019.

Summary

We are making steady progress on the 2019 Audit Program. This year the program includes seven active audits/reviews and four key initiatives. Similar to the previous year, the audit examinations cover a cross-section of departments and risks. I want to acknowledge my staff for their strong effort and dedication to delivering quality work. The Internal Audit Staff will continue to do a great job partnering with management, servicing the Board of Retirement, and protecting our members.

Alameda County Employees' Retirement Association
Internal Audit Department

Internal Audit Department
2019 Internal Audit Plan

June 20, 2019

Agenda

- Progress on the Internal Audit Plan
- Progress on the Employer Audit Plan
- Investment Watchlist Audit Results
- Cybersecurity Insurance Review
- Questions

2019 Internal Audit Plan

Internal Audit Program (2019)	Service Line	Assigned	Status	Q1	Q2	Q3	Q4
Medical Part B Premium Reimbursement (MBRP) Audit	Internal Audit	Lyndon	Started				
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Fraud Training for Staff	Special Project	Caxton/Lyndon	Started				

Employer Audit Plan

Participating Employer	2014	2015	2016	2017	2018	2019
Alameda County			X			
Superior Courts of California						X
Alameda Health System				X		
First 5 Alameda County	X					
Housing Authority of the County of Alameda		X				
Livermore Area Recreation and Park District	X					

Complete

In Process

INVESTMENT WATCHLIST AUDIT

CONTROL 1 - THE WATCHLIST PROCESS IS DOCUMENTED IN THE INVESTMENT POLICY

Risk Level - Medium

Audit Results – In Remediation

Control:

A documented investment policy exists that specifies the criteria used to place underperforming investment managers on the Watchlist status, recommend them for termination, or remove them from Watchlist.

Risk:

ACERA retains an underperforming investment manager leading to lower investment portfolio returns

CONTROL 2 – THE INVESTMENT MANAGERS ARE PLACED ON AND REMOVED FROM THE WATCHLIST IN A TIMELY MANNER

Risk Level - High

Audit Results – In Remediation

Control:

Investment Managers are placed and removed from the Watchlist based on the criteria established by the Investment Policy. Investment Managers on Watchlist status are carefully monitored.

Risk:

Underperforming or non-compliant managers are not dealt with or terminated in a timely fashion, leading to increased risk of loss or reduced investment returns.

Watchlist Audit Results

Controls Tested	Results
Control 1: Test 1	IN REMEDIATION
Control 2: Test 1	PASS
Control 2: Test 2	PASS
Control 2: Test 3	IMPROVEMENT OPPORTUNITY
Control 2: Test 4	PASS
Control 2: Test 5	PASS

The overall result of this audit is In Remediation since there were recent changes made to the Investment Policy and Watchlist process during the audit.

Key Findings

Key Finding – Probation Status was Unnecessary

The transition stage from the Watchlist to Probation Status was unnecessary and distorted the total time the investment manager was underperforming. There was no requirement that the manager move from the Watchlist to Probation Status to be sanctioned or terminated. An investment manager can be terminated at any time.

Key Finding – Plan of Actions were not issued

SECTION XIX: CONTRACT REVIEW PROCESS

Upon approval of a Watchlist or Probation recommendation:

1. Staff will notify the Manager of the Board's decision and will provide the Manager with a statement of concerns which outlines the areas which need improvement.
2. The Manager will be asked to respond in writing with an explanation of the issues and a proposed action plan to resolve the issues within thirty (30) calendar days of receipt of the statement of concerns.
3. Staff, a Consultant and the Manager will collectively draft a Plan of Action. The plan will identify the specific steps to be taken to correct the problem; the time frames for further review; and what additional monitoring may be required.

At the end of the time period specified in the Plan of Action, the Manager will be evaluated and one of the following actions may be taken:

(a) Removal from Contract Review: if the Manager successfully resolves the issues/deficiencies and demonstrates continued success in all other areas of its relationship with ACERA.
(b) Movement from Probation to Watchlist: if the Manager has satisfied all or most of the issues/deficiencies that caused it to be placed on Probation, yet Staff continues to have concerns about the Manager. If circumstances warrant, a Manager may also be moved from Watchlist to Probation at any time during the Contract Review Process.
(c) Extension of Contract Review: a Manager may be given additional time to satisfy the conditions of its Plan of Action if reasonable progress is being made. Extensions may also be granted if unfavorable market conditions or high costs make reallocation of assets inadvisable.
(d) Termination: if the Manager has not satisfactorily resolved the issues/deficiencies, Staff may recommend termination as described below. Termination may be recommended at any time during the Contract Review Process if circumstances warrant.

**Note that this language was part of the investment policy for the audit period under examination. The investment policy was subsequently revised in September 2018, where this language regarding Plan of Actions was deleted from the policy*

Key Finding – Investment Managers placed on the Watchlist or Probation status were rarely removed for termination, stability in the organizational structure or improved performance

# of Investment Managers on the Watchlist/Probation between 1/1/2013 – 12/31/2017	% of the Time the Investment Manager was reported on the Watchlist/Probation in the Test Period 1/1/2013 – 12/31/2017
6	The number of Investment Managers which were on the Watchlist or Probation 75-100% of the time during the test period.
3	Investment Managers were on the Watchlist or Probation 50-75% of the time during the test period.
1	Investment Manager was on the Watchlist or Probation 25-50% of the time during the test period.
7	Investment Managers were on the Watchlist or Probation 0-25% of the time during the test period.
19	**Total of 19 Investment Managers were reported on the Watchlist during the test period.**

9 out of 19 Investment Managers were on the Watchlist or Probation at least 50% of the time over the test period.

Recommendations

Framework for Audit Recommendations

- ACERA has chosen to implement a Watchlist.
- An investment manager was hired to meet a specific Board mandate.
- Asset allocation drives investment returns more than manager selection.
- Manager selection and termination decisions should be considered within the broader asset allocation framework.
- Managers should be evaluated on both **qualitative** and quantitative factors.
- Other considerations should include a review of fees and potential risks.
- There are high costs for retaining unskilled managers for too long and terminating skilled managers prematurely.
- Just because the investment manager is on the Watchlist, does **NOT** mean, that a termination or adverse action needs to be taken. A decision to terminate, remediate **or retain** should be justified if performance or non-performance measures are missed.

Control 1 – Recommendations

1. Under Section XX: Manager Watchlist Process (A. Placement on Watchlist), consider adding a requirement that the investment manager immediately notifies ACERA if the manager is involved with any **litigation**, as an example of reasons to placement on the Watchlist.

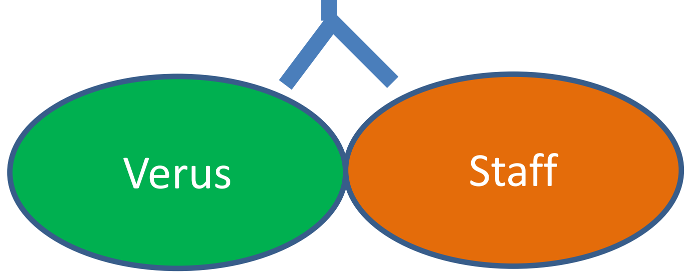
2. Under Section XX: Manager Watchlist Process (A. Placement on Watchlist), consider adding a requirement that the investment manager immediately notifies ACERA if the investment manager violates **compliance** with federal or state security laws, gross negligence or willful misconduct.

Watchlist Cycle

(Rolling 5 Years)
Pre-Watchlist Period

(Fixed 5 Years)
Watchlist Period

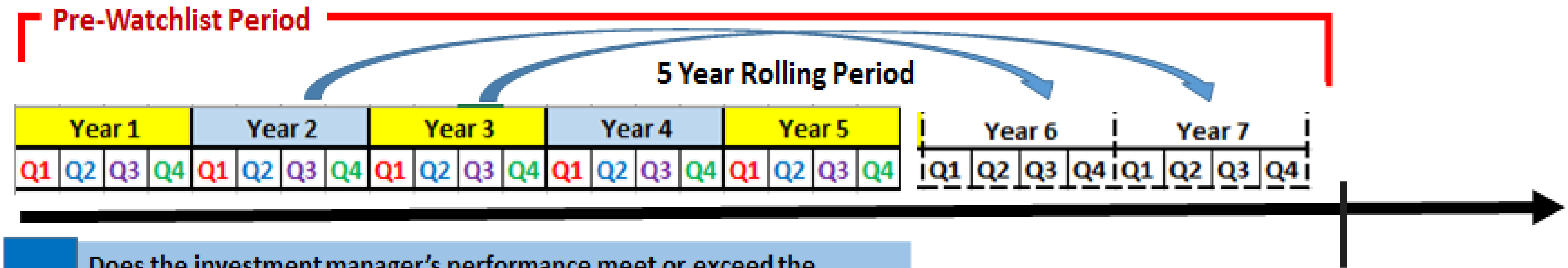
Investment Manager is underperforming or out of compliance



Staff and Verus will each **independently** opine on whether the investment manager should be placed on the Watchlist

Note that staff or Verus can recommend termination or remediation action at any time during the pre-Watchlist period or Watchlist Period

Pre-Watchlist Period Criteria



Decision made to add the investment manager to the Watchlist

Performance

Does the investment manager's performance meet or exceed the established benchmark at least 80% of the time over the cumulative five year rolling period? If not, consider including them on the Watchlist.

Does the Investment manager's performance meet or exceed the median performance of their peer group at least 80% of the time over the cumulative five year rolling period. If not, consider including them on the Watchlist.

Non-Performance

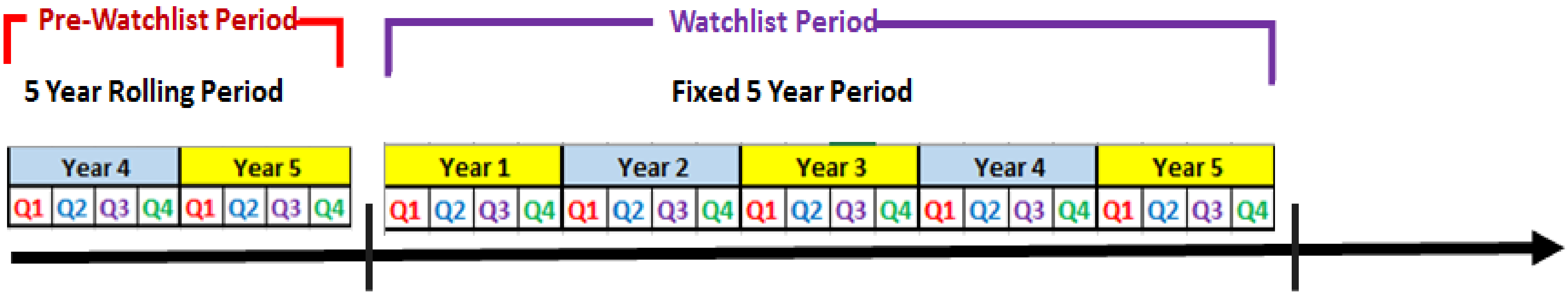
At any time if the Investment manager fails to meet their compliance and contractual obligations, they can be considered for the Watchlist.

At any time if the investment manager is not managing entity-level risk adequately (i.e. organizational change), they can be added to the Watchlist.

Other considerations (i.e. style deviation, high fees) can be used to include the investment manager to the Watchlist at any time.

Watchlist Action Plan

** Note that staff/Verus can recommend termination or other sanctions against an investment manager at any time.*



Decision made to add the investment manager to the Watchlist

Action plan developed to monitor investment manager, including an exit plan if the investment manager fails to meet expectations

If the manager fails to meet performance or non-performance measures within five years, staff/Verus will document their reasons whether to retain, terminate, sanction, or continue monitoring the investment manager.

Performance	Does the investment manager's performance meet or exceed the established benchmark at least 85% of the time over a fixed five year period (starting on the date the investment manager was placed on the Watchlist). ? If not, consider the appropriate action (i.e. continue monitoring, renegotiating fees, reducing the investment allocation to the manager, or terminating the manager).
	Does the Investment manager's performance meet or exceed the median performance of their peer group at least 85% of the time over a fixed five year period (starting on the date the investment manager was placed on the Watchlist). If not, consider the appropriate action (i.e. continue monitoring, renegotiating fees, reducing the investment allocation to the manager, or terminating the manager).
NP	The non-performance criteria from the Pre-Watchlist Period applies, with the same remedies available above.

NP = Non-Performance

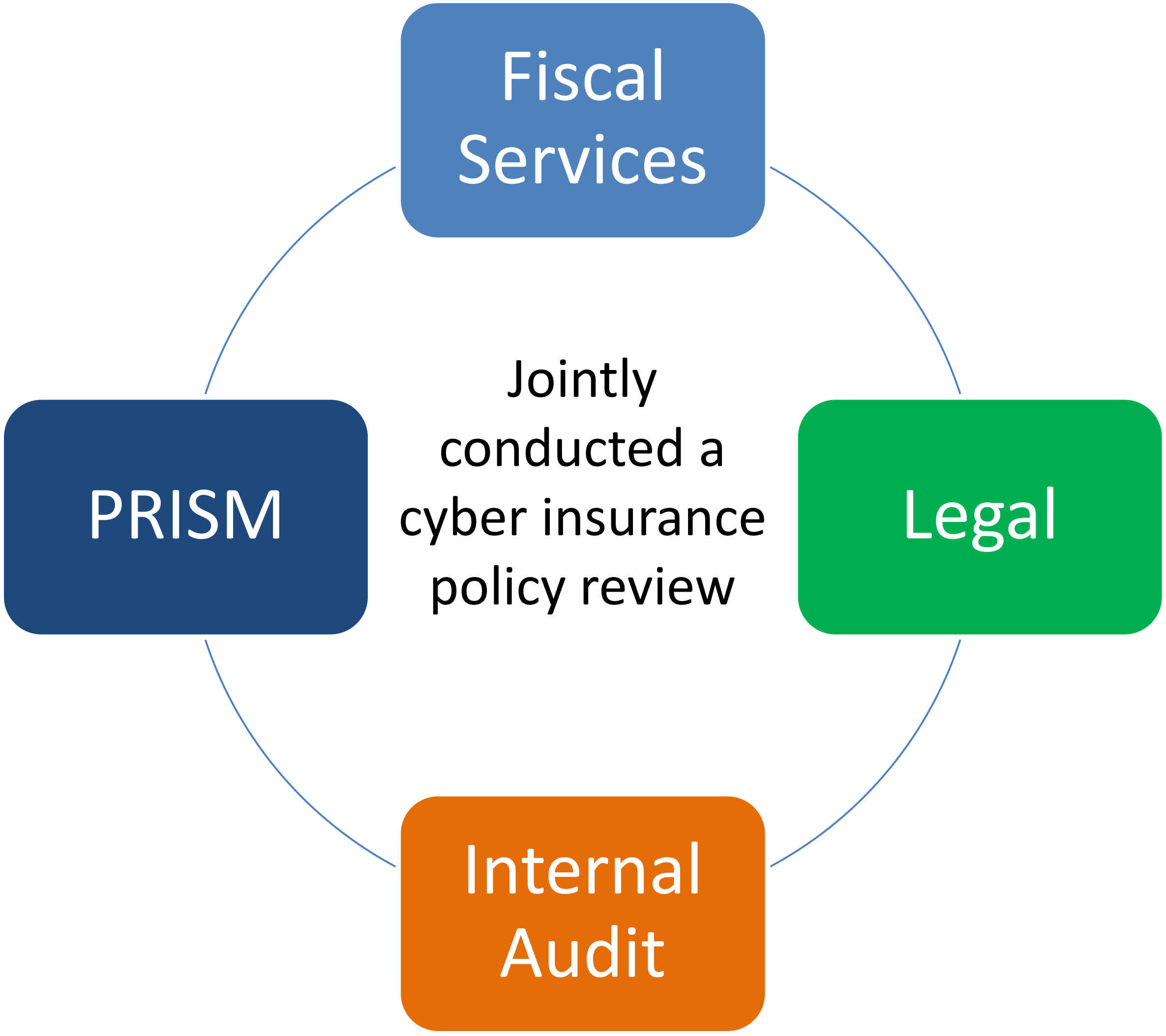
Informal Recommendations

1. Provide more information to the trustees on the make-up of the peer group for an investment manager, why the investment manager best fits in that specific peer group, and why the investment manager might be outperforming or underperforming compared to its peers
2. Consider optimizing the Watchlist reporting process. Currently, the Watchlist results are reported by both Verus (Manager Compliance Checklist) and Staff (Investment Manager's Monthly Report) separately. By consolidating the Watchlist reporting into a single report, and focusing the content of the reporting on alerting the trustees about concerns, possible actions, and recommendations, the trustees can be made aware of significant issues in advance.

Cybersecurity Insurance Review

Partial List of Areas Reviewed

- Post breach services
- First and third party risks
- Exclusions
- Insider threats
- Cyber terrorism
- Information maintained by third parties
- Accidental distribution of confidential information
- Waiting period before activating insurance coverage
- Business interruption



ACERA's Cyber Insurance Framework

- Who is BCS Insurance Company? (Slide 1)
- Overview (Slide 2)
  - Trends & Breaches (Slides 3-6)
  - Compliance & Regulations (Slides 7-8)
  - Policies & Training (Slides 9-11)
- Coverage & Bench Marking (Slides 12-15)
- Cyber Resilience Structure (Slide 16)

Cyber insurance as a component of an overall cybersecurity strategy

- Importance of integrating cyber insurance as part of incident response planning and disaster recovery.
- Expert third-party technical resources available in a crisis.
- Cybersecurity training

Managing Risk

- Third-party risk:
  - Third party vendors, consultants, and advisors perform a wide variety of services for ACERA that could potentially adversely impact ACERA's data.
- Managing the risk:
  - ACERA has implemented standard contract language to ensure vendors who manage confidential and sensitive data are protecting ACERA's information and systems.
  - ACERA's standard indemnity language requires vendors whose activities could impact ACERA's data to accept responsibility for cyber incidents that occur through their actions or relationships.
  - ACERA requires, when appropriate, that vendors carry adequate insurance coverage for cyber incidents arising from their own actions and those of their supply chain.
    - Coverage can include, where appropriate:
      - Security and privacy liability,
      - Privacy breach response costs,
      - Fines and penalties
      - Media liability,
      - Cyber extortion

Questions

MEMORANDUM TO THE AUDIT COMMITTEE

DATE: June 20, 2019

TO: Members of the Audit Committee

FROM: Harsh Jadhav, Chief of Internal Audit

SUBJECT: Asset Tracking Audit Results

EXECUTIVE SUMMARY

The Retirement Board ("Board") has contracted with several external investment managers to invest ACERA's assets in the capital markets. Part of the Board's fiduciary duty is to prudently select, monitor, and supervise these investment managers. Section XX of the revised Investment Policy describes the procedures used to notify investment managers of these policy guidelines, the method of evaluation, and the structure used to monitor the performance.

In general, investment managers will be monitored to evaluate how well they achieve their investment objectives; adhere to their investment approach/style, and identify issues or trends that have a potential to result in losses to the fund. The Board relies on Staff and the General Investment Consultant ("Verus") to alert the Investment Committee when investment managers are not performing to expectations, significant organizational changes occur, or when the management is out of compliance, so appropriate remedial action can be taken.

AUDIT OBJECTIVE

The objective of this audit is to review the Investment Department's procedures for monitoring investment manager performance and compliance based on the criteria outlined in the General Investment Guidelines, Policies, and Procedures ("Investment Policy"). Our focus will be to assess whether the internal controls were designed effectively to monitor investment managers, and performance reviews were conducted in accordance with the policy and established procedures.

SCOPE AND STRATEGY

The audit focused on reviewing decisions made by ACERA to retain, monitor, and terminate investment managers based on criteria established for the Watchlist and Probation process. The audit focused on the period January 1, 2013 to December 31, 2017, where we examined the track record of certain investment managers to understand better the duration of the underperformance and the actions taken by staff and Verus to monitor and report potential issues to the Investment Committee. We understand that evaluations of investment managers are made using both quantitative and qualitative measures. Performance, risk, overall fit in the portfolio, and the asset allocation influence the decision to retain an investment manager. It should be noted that Investment Staff remediated certain sections in the General Investment Guidelines, Policies and Procedures related to the Watchlist and Probation procedures during the audit, and a revised investment policy was subsequently approved by the Board of Retirement.

We relied on information provided by the consultant (Verus) and the Investment Department as our primary sources of audit evidence. Areas that we felt had higher risk was the transition between each stage of the evaluation process (i.e., Watchlist to Probation status), ongoing monitoring, the decision-making process used to terminate a manager and ensuring the criteria for termination was clear and actionable. We did review the investment policies and best practices used by other public agencies to offer as recommendations for improvement. Public information provided to the Board of Retirement related to performance (i.e., Quarterly Performance Management Review) was used to validate the supporting evidence.

RESULTS – IN REMEDIATION

The overall result of this audit is **In Remediation** since there were recent changes made to the Investment Policy and Watchlist process during the audit. Typically we need sufficient audit data and history after the controls have been implemented before we can opine on the effectiveness of the new controls.

KEY RECOMMENDATIONS:

1. We recommend that if an investment manager is out of compliance or underperforming 80% of the time over five years, both staff and the consultant should sign off independently about whether the investment manager should be added or not added to the Watchlist.

2. We recommend that if an investment manager is on the Watchlist for 85% of the time over five years, they should be identified and communicated to the Board with a joint recommendation by staff and the consultant on whether the Board should take remediation or termination action.

3. We recommend that once an investment manager has been added to the Watchlist, the Investment Department and consultant develop action plans internally to prepare ACERA for the possibility that the investment allocation to that investment manager could be reduced or the investment manager may be terminated.

Alameda County Employees' Retirement Association
Internal Audit Department

Investment Watchlist Audit
Report Date: June 2019

INTERNAL AUDIT DEPARTMENT

REPORT PREPARED FOR:

ACERA BOARD OF RETIREMENT

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CONTROL SUMMARY

KEY CONTROLS

#	Control	Risk Level	Effectiveness
1	**THE WATCHLIST PROCESS IS DOCUMENTED IN THE INVESTMENT POLICY** A documented investment policy exists that specifies the criteria used to place underperforming investment managers on the Watchlist status, recommend them for termination, or remove them from Watchlist.	**Medium**	**In Remediation**
2	**THE INVESTMENT MANAGERS ARE PLACED ON AND REMOVED FROM THE WATCHLIST IN A TIMELY MANNER** Investment Managers are placed and removed from the Watchlist based on the criteria established by the Investment Policy. Investment Managers on Watchlist status are carefully monitored.	**High**	**In Remediation**

RISK LEVEL

High-Risk Controls:
Controls associated with critical processes within an organization. Typically they are associated with overall monitoring controls or valued in key or numerous processes. They can be controls that had significant findings in previous years. A high-risk control failing could result in a material weakness. Material weakness includes material misstatements in the financial statements, significant process errors, and misuse of ACERA resources.

Medium Risk Controls:
Controls associated with important processes within an organization, where a deficiency in the control could cause financial loss or breakdown in process, but in most cases do not lead to a critical systemic failure. Typically, these controls had minimal or no findings in previous years, but are integral to the process and necessary to test on a regular basis. A medium risk control failing could result in a significant deficiency, and in some instances, a material weakness. Significant deficiencies can include staff competency, lack of consistent business process, and poor utilization of ACERA resources.

Low-Risk Controls:
Controls associated with process optimization and non-critical processes. Typically they represent controls that did not have findings in the previous year's testing and have not changed in how they operate or in the personnel performing the controls. Low-risk controls are inherent in the current control environment but are unlikely to cause a material misstatement, unless there is a failure of several low-risk controls within the same process.

CONTROL EFFECTIVENESS

Effective:
The control is fully operating as designed.

Partially Effective:
The control is operating as designed with the modification necessary due to a change in business process, change in personnel, inadequate documentation, the control has not been fully implemented, or the control requires additional enhancements to be effective. Often new controls will fall in this category.

Improvement Opportunity:
The control is only marginally effective and should be redesigned or implemented. Typically these controls require review due to an ineffective design, which will prevent the control from detecting control risk.

Ineffective:
The control is not operating as designed and could lead to a significant risk to the organization, if not remediated.

Remediated/In Remediation:
The control was previously ineffective, partially effective, or an improvement opportunity. A remediation plan is in place to correct the deficiency. Note that reliance can be placed on the remediated control, once retested by internal audit, which typically occurs in the following audit cycle.

EXECUTIVE SUMMARY

The Retirement Board ("Board") has contracted with several external investment managers to invest ACERA's assets in the capital markets. Part of the Board's fiduciary duty is to prudently select, monitor, and supervise these investment managers. Section XX of the revised Investment Policy describes the procedures used to notify investment managers of these policy guidelines, the method of evaluation, and the structure used to monitor the performance.

In general, investment managers will be monitored to evaluate how well they achieve their investment objectives; adhere to their investment approach/style, and identify issues or trends that have a potential to result in losses to the fund. The Board relies on Staff and the General Investment Consultant ("Verus") to alert the Investment Committee when investment managers are not performing to expectations, significant organizational changes occur, or when the management is out of compliance, so appropriate remedial action can be taken.

AUDIT OBJECTIVE

The objective of this audit is to review the Investment Department's procedures for monitoring investment manager performance and compliance based on the criteria outlined in the General Investment Guidelines, Policies, and Procedures ("Investment Policy"). Our focus will be to assess whether the internal controls were designed effectively to monitor investment managers, and performance reviews were conducted in accordance with the policy and established procedures.

SCOPE AND STRATEGY

The audit focused on reviewing decisions made by ACERA to retain, monitor, and terminate investment managers based on criteria established for the Watchlist and Probation process. The audit focused on the period January 1, 2013 to December 31, 2017, where we examined the track record of certain investment managers to understand better the duration of the underperformance and the actions taken by staff and Verus to monitor and report potential issues to the Investment Committee. We understand that evaluations of investment managers are made using both quantitative and qualitative measures. Performance, risk, overall fit in the portfolio, and the asset allocation influence the decision to retain an investment manager. It should be noted that Investment Staff remediated certain sections in the General Investment Guidelines, Policies and Procedures related to the Watchlist and Probation procedures during the audit, and a revised investment policy was subsequently approved by the Board of Retirement.

We relied on information provided by the consultant (Verus) and the Investment Department as our primary sources of audit evidence. Areas that we felt had higher risk was the transition between each stage of the evaluation process (i.e., Watchlist to Probation status), ongoing monitoring, the decision-making process used to terminate a manager and ensuring the criteria for termination was clear and actionable. We did review the investment policies and best practices used by other public agencies to offer as recommendations for improvement. Public information provided to the Board of Retirement related to performance (i.e., Quarterly Performance Management Review) was used to validate the supporting evidence.

AUDIT LIMITATIONS

The scope of this compliance audit does not include an audit of ACERA's financial statements, journal entries, or accounting ledgers. Financial statements are audited annually by ACERA's external auditors. Since the external auditors are independent and competent third parties, we can rely on their audit opinion of the financial statements as the foundation for conducting our audit.

This audit relied primarily on data provided by ACERA's Investment Department and information obtained independently during the audit from third parties. Although we reviewed the information provided to the Investment Committee, Board of Retirement and Investment Staff by third parties such as State Street, the investment managers, and the investment consultants, this audit did not include independent verification of information provided by third parties. Since we are performing an internal audit, our scope precludes us from auditing and issuing an opinion on the effectiveness of any third party's internal controls. Watchlist criteria, including organizational change, compliance, investment style, service levels, and fees were not included in the scope of the audit since these requirements are regularly reviewed with the trustees.

Finally, the audit was focused on the consistency and rigor of the on-going due diligence process used in monitoring and evaluating investment manager performance, after ACERA made the initial investment. We recognize that there are certain subjective decisions that are made by the Investment Staff and General Investment Consultant related to making recommendations to the Board on whether to terminate an investment manager. Internal Audit cannot opine on whether the decisions were correct since auditors are not qualified to determine the adequacy of such business and legal decisions.

AUDIT GUIDANCE AND STANDARDS

Internal auditing is conducted in diverse legal and cultural environments; within organizations that vary in purpose, size, complexity, and structure; and by persons within or outside the organization. While differences may affect the practice of internal auditing in each environment, conformance with general internal audit standards is essential in meeting the responsibilities of internal auditors and the internal audit activity. If certain internal audit activity or standard are prohibited by policy, law or regulation, appropriate disclosures are needed.

If general internal audit standards are used in conjunction with standards issued by other authoritative bodies, internal audit communications may also cite the use of other standards, as appropriate. In such a case, if inconsistencies exist between the general internal audit standards and other standards, internal auditors and the internal audit activity must conform to the Standards and may conform with the other standards if they are more restrictive.

The purpose of standards is to:

A. Delineate basic principles that represent the practice of internal auditing.
B. Provide a framework for performing and promoting a broad range of value-added internal auditing.
C. Establish the basis for the evaluation of internal audit performance.
D. Foster improved organizational processes and operations.

Standards are principles-focused requirements consisting of:

(1) Statements of basic requirements for the professional practice of internal auditing and for evaluating the effectiveness of performance, which are internationally applicable at organizational and individual levels.

(2) Interpretations clarify terms or concepts within the statements. The standards employ specific terms. Specifically, the standards use the word "must" to specify an unconditional requirement and the word "should" where conformance is expected unless, when applying professional judgment, circumstances justify deviation. It is necessary to consider the statements and their interpretations, as well as the specific meanings from the glossary to understand and apply the standards correctly.

(3) The structure of the standards is divided between attribute and performance standards. Attribute standards address the attributes of organizations and individuals performing internal auditing. The performance standards describe the nature of internal auditing and provide quality criteria against which the performance of these services can be measured. The attribute and performance standards are also provided to apply to all internal audit services.

Assurance services involve the internal auditor's objective assessment of evidence to provide an independent opinion or conclusions regarding an entity, operation, function, process, system, or other subject matter. The nature and scope of the assurance engagement are determined by the internal auditor. There are generally three parties involved in assurance services:

A. The person or group directly involved with the entity, operation, function, process, system, or other subject matter - the process owner
B. The person or group making the assessment - the internal auditor
C. The person or group using the assessment - the user.

Consulting services are advisory, and are generally performed at the specific request of an engagement client. The nature and scope of the consulting engagement are subject to agreement with the engagement client. Consulting services generally involve two parties:

A. The person or group offering the advice - the internal auditor
B. The person or group is seeking and receiving the advice - the engagement client.

Consulting services are advisory, and are generally performed at the specific request of an engagement client. The nature and scope of the consulting engagement are subject to agreement with the engagement client. Finally, the Internal Audit Department personnel are not trained or qualified to offer recommendations on legal, actuarial, or investment matters. Any questions on these issues should be directed to the appropriate ACERA Department and qualified consultant. Hence, no part of the Internal Audit Report should be construed as legal, actuarial, or investment advice.

CONTROLS TESTED

CONTROL 1 - THE WATCHLIST PROCESS IS DOCUMENTED IN THE INVESTMENT POLICY

Risk Level - Medium

Audit Results – In Remediation

Control:

A documented investment policy exists that specifies the criteria used to place underperforming investment managers on the Watchlist status, recommend them for termination, or remove them from Watchlist.

Risk:

ACERA retains an underperforming investment manager leading to lower investment portfolio returns.

Owner:

Investments

TEST 1: ACERA HAS AN ESTABLISHED INVESTMENT POLICY WHICH DESCRIBES THE WATCHLIST PROCESS

Internal Audit inquired with the Investment Department if a documented Investment Policy existed detailing the Watchlist, Probation, and Termination Process. The General Investment Guidelines, Policies, and Procedures ("Investment Policies") existed and was subsequently revised to incorporate certain internal audit recommended changes that were discussed informally with the Investment Department. The revised policy was approved by the Board in September 2018.

The revised policy allows for more flexibility, where investment staff and the consultant are not held to rigid short-term quantitative criteria to measure performance. This enables staff and the consultant to apply a holistic view, considering factors like the relationship with the investment manager, transition costs, long-term economic trends, and the overall impact on the investment portfolio.

Section XIX: Manager Monitoring Procedure of the revised policy specifies that Managers will be monitored to:

1. Evaluate how well they achieve their investment objectives.

2. Ensure that they adhere to their established investment approach/style and do not attempt to index returns to preserve stellar performance or take the extraordinary risk to overcome poor performance.
3. Identify issues or trends that have the potential to result in intermediate and long-term capital losses to the Fund.
4. Alert the Board of Retirement when investment managers are not performing to expectations so that appropriate remedial action can be taken.

The criteria for how investment managers will be evaluated continue to include:

a. Performance
b. Style Integrity
c. Organizational Stability
d. Compliance
e. Client Service
f. Fees

The revised policy simplifies the due diligence process by having only the Watchlist and eliminates the need for a separate probation process.

The criteria for inclusion on the Watchlist could include:

a. Insufficient net of fee, longer-term returns versus the benchmark and peer group.
b. Changes to style and the risk of the profile of the portfolio.
c. Organizational instability
d. The loss of key investment professionals
e. Significant asset loss
f. Violations of the Manager's Investment Management Agreements with ACERA.

Possible courses of action ACERA can take if the investment manager fails to remediate the issues raised by staff and consultant are as follows:

a. Reduction of assets under management
b. Revision of investment contract guidelines for that manager.
c. Renegotiation of fees
d. Termination of the manager's contract
e. Any other actions deemed appropriate by the Board

Test 1 Results

In Remediation

The revised investment policy changes are an improvement over the previous policy. The new Watchlist guidelines are focused on evaluating an investment manager with a long-term focus and provide for a simplified monitoring and reporting process. The key changes made included deleting the Probation language and removing the rules-based Watchlist criteria.

Control 1 - Recommendations	Business Owner
1. Under Section XX: Manager Watchlist Process (A. Placement on Watchlist), consider adding a requirement that the investment manager immediately notifies ACERA if the manager is involved with any litigation, as an example of reasons to placement on the Watchlist.	Investment Department
2. Under Section XX: Manager Watchlist Process (A. Placement on Watchlist), consider adding a requirement that the investment manager immediately notifies ACERA if the investment manager violates compliance with federal or state security laws, gross negligence or willful misconduct.	Investment Department

CONTROL 2 – THE INVESTMENT MANAGERS ARE PLACED ON AND REMOVED FROM THE WATCHLIST IN A TIMELY MANNER

Risk Level - High

Audit Results – In Remediation

Control:

Investment Managers are placed and removed from the Watchlist based on the criteria established by the Investment Policy. Investment Managers on Watchlist status are carefully monitored.

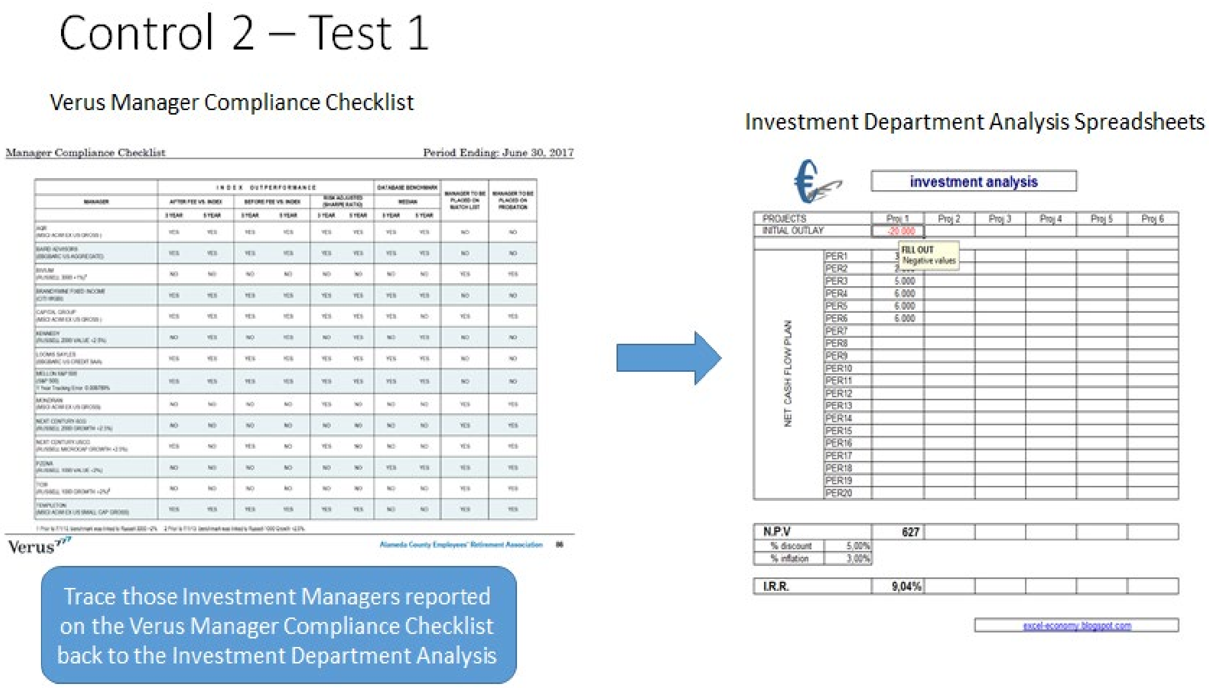
Risk:

Underperforming or non-compliant managers are not dealt with or terminated in a timely fashion, leading to increased risk of loss or reduced investment returns.

Owner:

Investment Department

TEST 1: INVESTMENT MANAGERS NOT MEETING PERFORMANCE, CONTRACTUAL OR COMPLIANCE OBJECTIVES WERE PLACED ON THE WATCHLIST



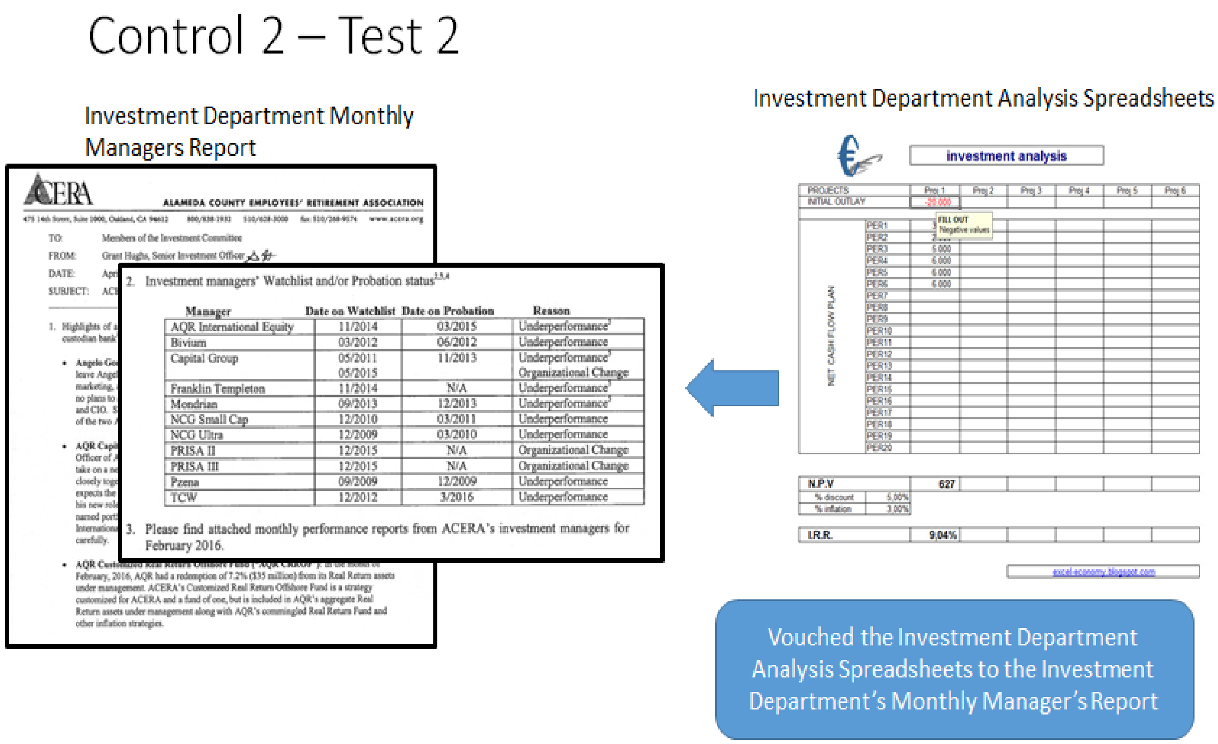
<u>Test 1 Results</u>

Pass

We sampled published investment returns of investment managers from the Total Fund Performance Summary provided by Verus to the Board, to identify those managers with performance rankings below the 50th percentile (per the eVestment Alliance Style Universe). We traced those underperforming investment managers back to the internal workpapers provided by the Investment Department to confirm whether those managers met the criteria to be placed on the watchlist or probation based on performance.

No Exceptions Reported.

TEST 2: INVESTMENT MANAGERS PLACED ON OR REMOVED FROM THE WATCHLIST WERE DISCLOSED TO THE INVESTMENT COMMITTEE.



Manager	Date on Watchlist	Date on Probation	Reason
AQR International Equity	11/2014	03/2015	Underperformance
Bivium	03/2012	06/2012	Underperformance
Capital Group	05/2011 05/2015	11/2013	Underperformance Organizational Change
Franklin Templeton	11/2014	N/A	Underperformance
Mondrian	09/2013	12/2013	Underperformance
NCG Small Cap	12/2010	03/2011	Underperformance
NCG Ultra	12/2009	03/2010	Underperformance
PRISA II	12/2015	N/A	Organizational Change
PRISA III	12/2015	N/A	Organizational Change
Pzena	09/2009	12/2009	Underperformance
TCW	12/2012	3/2016	Underperformance

Test 2 Results

✔ Pass

We sampled the analyst spreadsheets provided by the Investment Department to determine if investment managers identified by staff to be placed on the Watchlist or Probation were disclosed to the Investment Committee as part of the ACERA Investment Manager's Monthly Report and Verus' Investment Performance Review. Underperforming investment managers in the analyst spreadsheets were vouched through to the Monthly Manager Report and the Verus Investment Performance Review.

No Exceptions Reported

TEST 3: INVESTMENT MANAGERS PLACED ON THE WATCHLIST WERE ISSUED WITH AN ACTION PLAN

SECTION XIX: CONTRACT REVIEW PROCESS

***Note that this language was part of the investment policy for the audit period under examination. The investment policy was subsequently revised in September 2018, where this language regarding Plan of Actions was deleted from the policy**

Upon approval of a Watchlist or Probation recommendation:

1. Staff will notify the Manager of the Board's decision and will provide the Manager with a statement of concerns which outlines the areas which need improvement.
2. The Manager will be asked to respond in writing with an explanation of the issues and a proposed action plan to resolve the issues within thirty (30) calendar days of receipt of the statement of concerns.
3. Staff, a Consultant and the Manager will collectively draft a Plan of Action. The plan will identify the specific steps to be taken to correct the problem; the time frames for further review; and what additional monitoring may be required.

   At the end of the time period specified in the Plan of Action, the Manager will be evaluated and one of the following actions may be taken:

   (a) Removal from Contract Review: if the Manager successfully resolves the issues/deficiencies and demonstrates continued success in all other areas of its relationship with ACERA.
   (b) Movement from Probation to Watchlist: if the Manager has satisfied all or most of the issues/deficiencies that caused it to be placed on Probation, yet Staff continues to have concerns about the Manager. If circumstances warrant, a Manager may also be moved from Watchlist to Probation at any time during the Contract Review Process.
   (c) Extension of Contract Review: a Manager may be given additional time to satisfy the conditions of its Plan of Action if reasonable progress is being made. Extensions may also be granted if unfavorable market conditions or high costs make reallocation of assets inadvisable.
   (d) Termination: if the Manager has not satisfactorily resolved the issues/deficiencies, Staff may recommend termination as described below. Termination may be recommended at any time during the Contract Review Process if circumstances warrant.

Test 3 Results

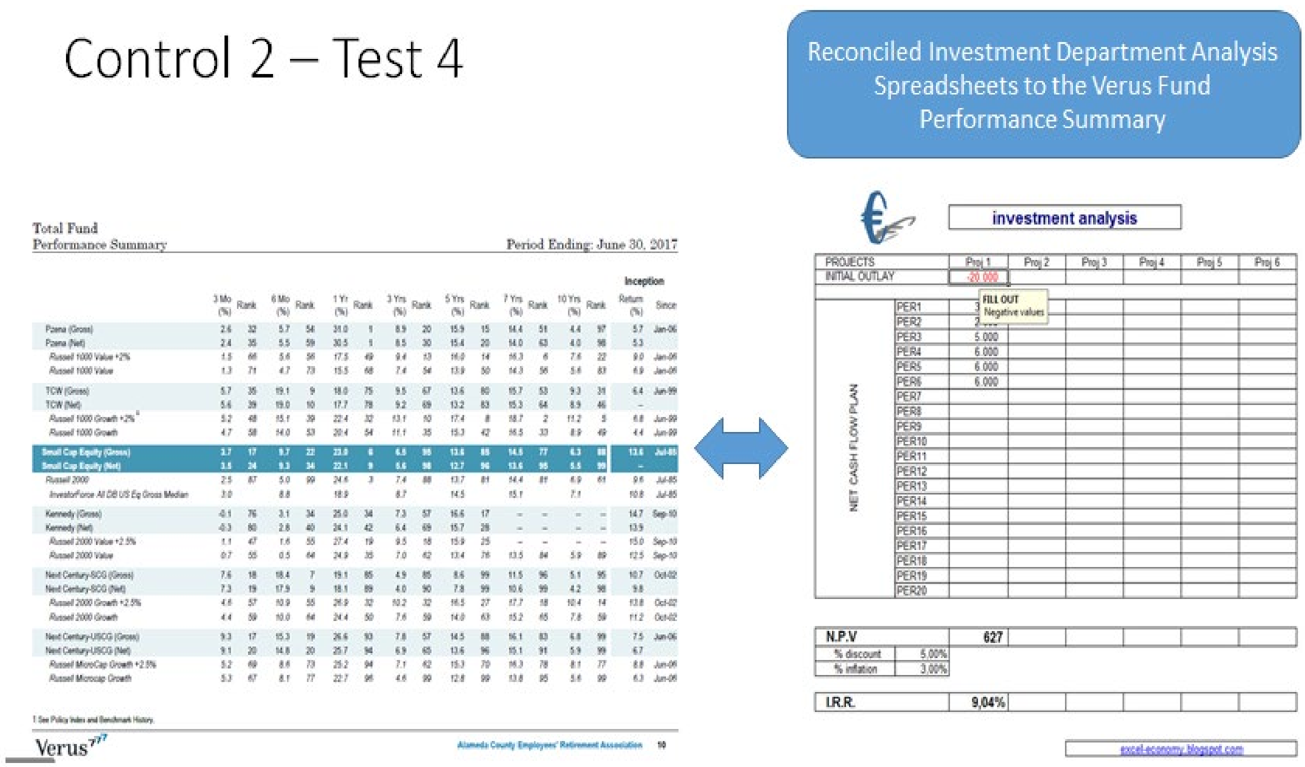
Improvement Opportunity

Previously, the Investment Policy (Amended May 20, 2013) Section XIX: Contract Review Process required Investment Staff to notify the Investment Manager of the Board's decision to place the manager on Watchlist or Probation Status with a Statement of Concerns outlining areas which need improvement.

Also, the policy stated that the Investment Manager would be asked to respond in writing with a proposed action plan within 30 days of receipt of the Statement of Concerns, and then the Investment Staff, Consultant and Investment Manager will collectively draft the Plan of Action. The plan would identify the specific steps to correct the problem, establish timeframes for further review, and additional monitoring that may be required. For the years under audit examination, this part of the policy was in effect and therefore tested for compliance.

Although letters were sent to investment managers to inform them of the specific reason the Investment Manager was placed on Watchlist or Probation Status, there was no evidence that written action plans were provided back by the investment managers within 30 days of issuance of the statement of concerns explaining how they were planning on resolving the identified issues. In the revised Investment Policy (September 2018), the language requiring an action plan for managers placed on a Watchlist was deleted.

TEST 4: INVESTMENT DEPARTMENT WATCHLIST PROCEDURES WERE PERFORMED ACCURATELY AND COMPLETELY



Test 4 Results

Pass

To comply with the Investment Guidelines for the managed accounts, the Investment Department prepares an analysis spreadsheet to track each investment manager's performance for a rolling five year period to determine if the performance exceeded the established benchmark over two consecutive quarters, and also exceeded the median of the manager's peer ranking for two consecutive quarters. The analyst spreadsheets are then compared to the Verus Quarterly Report to ensure that the performance and median ranking reconcile. The Verus Quarterly Reports are provided to the Investment Committee as part of the documentation provided to the trustees as part of the Investment Committee distribution process.

We sampled five Investment Managers for four reporting periods to determine if the information was adequately tracked, reconciled, and reported to the Investment Committee. Although two exceptions were discovered where the analysis spreadsheets prepared by Investment Department did not exactly match the Verus Quarterly Reports, the exceptions were minor and would not have changed the overall result of whether the Investment Manager would be listed on the Watchlist or Probation Status.

TEST 5: INVESTMENT MANAGERS RECOMMENDED FOR TERMINATION WERE COMMUNICATED TO THE INVESTMENT COMMITTEE IN A TIMELY MANNER

Test 5 Results:

Pass

Investment Managers are reviewed and recommended for termination if they fail to meet performance, compliance, and contractual requirements. The Investment Department provided documentation regarding three terminated investment managers, and we noted that of the three, two investment managers were terminated in the test period of 1/1/14 – 12/31/17. In both cases, the terminations were documented and communicated to the Investment Committee promptly.

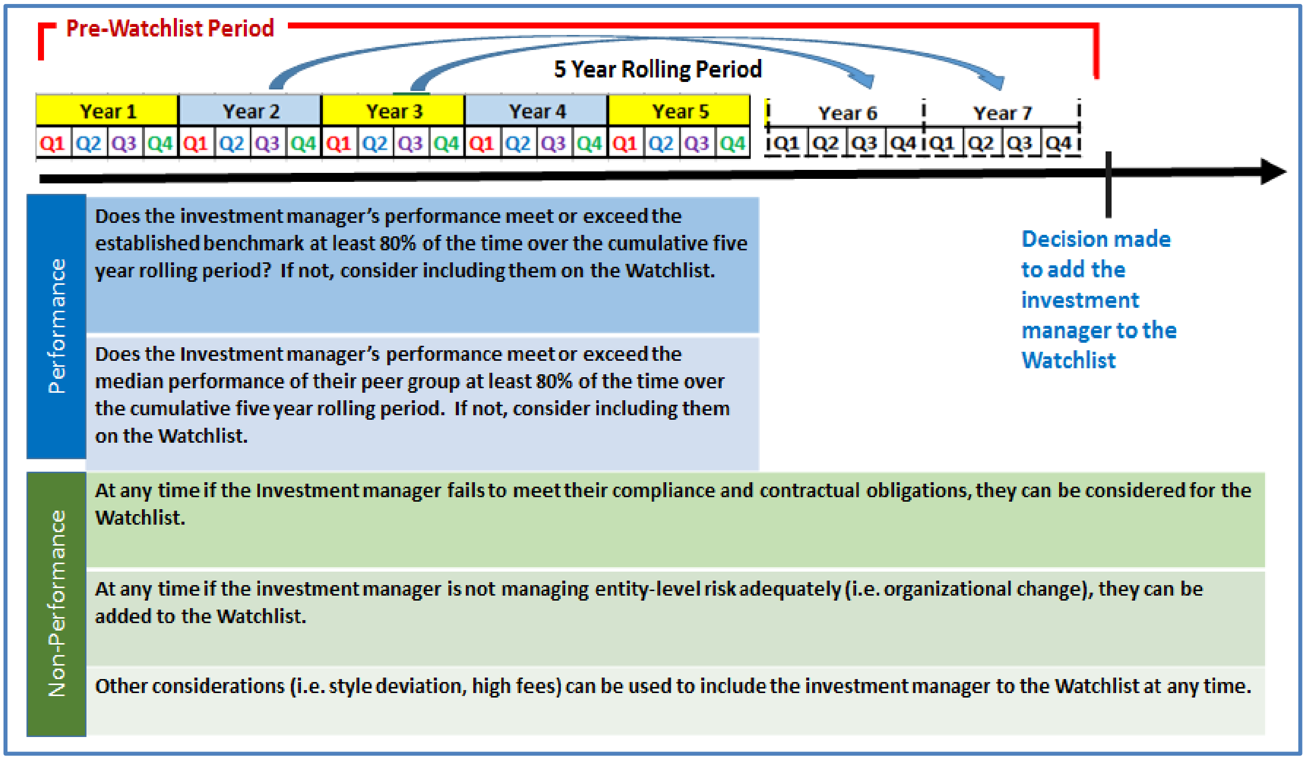
No exceptions noted.

Control 2 - Recommendations	Business Owner
1. We recommend combining the Watchlist and Probation into one list. The transition from Watchlist to Probation distorts the total time the investment manager has been under scrutiny. Furthermore, there does not appear to be any benefit to having a Probation status, since there is no requirement that investment managers move from Watchlist to Probation to be terminated. Investment managers can be terminated at any time.	Investment Department (Remediated)
2. We recommend that if an investment manager is out of compliance or underperforming 80% of the time over five years, both staff and the consultant should sign off independently about whether the investment manager should be added or not added to the Watchlist. Any disagreement between staff and the consultant on whether an investment manager should be added to the Watchlist should be raised to the Investment Committee for review. Please refer to the detailed remediation section below regarding how this recommendation could be implemented.	Investment Department
3. Once an investment manager has been added to the Watchlist, we recommend that the Investment Department and consultant develop action plans internally to prepare ACERA on recommendations to mitigate identified risks associated with the investment manager and plan for the possibility that the investment allocation to that investment manager could be reduced or the investment manager may be terminated.	Investment Department
4. Investment Managers on the Watchlist for 85% of the time over five years should be identified and communicated to the Board with a joint recommendation by staff and the consultant on whether the Board should take remediation or termination action. Please refer to the detailed remediation section below regarding how this recommendation could be implemented.	Investment Department

DETAILED REMEDIATION SECTION

Control 2 - Recommendation 2: Pre-Watchlist Criteria

We understand that we are moving away from using Watchlist criteria with hard quantitative measures to evaluate the investment managers to a more qualitative approach, with a longer-term perspective. Therefore the criteria recommended below are only guidelines and allow for flexibility for staff and Verus to determine if an investment manager should be placed on the Watchlist. We have classified the Watchlist criteria into two broad classes (performance and non-performance).



Performance Criteria

The performance criteria are based on assessing if the investment manager meets two tests. First, does the investment manager outperform the established benchmark 80% of the time, over a cumulative rolling five-year period (measured quarterly)? Second, does the investment manager outperform their peer group 80% of the time, over a cumulative rolling five-year period (measured quarterly)?

If the investment manager fails either test over a rolling five-year period, the Investment Department (staff) and Verus will each independently opine if the investment manager should be placed on the Watchlist. If staff and Verus disagree, it should be brought to the Investment Committee for discussion. If both agree, it should be documented as to the reasons why the investment manager was/was not included on the Watchlist. If an investment manager is hired for less than five years, discretion to add the investment manager to the Watchlist would be left to staff and Verus.

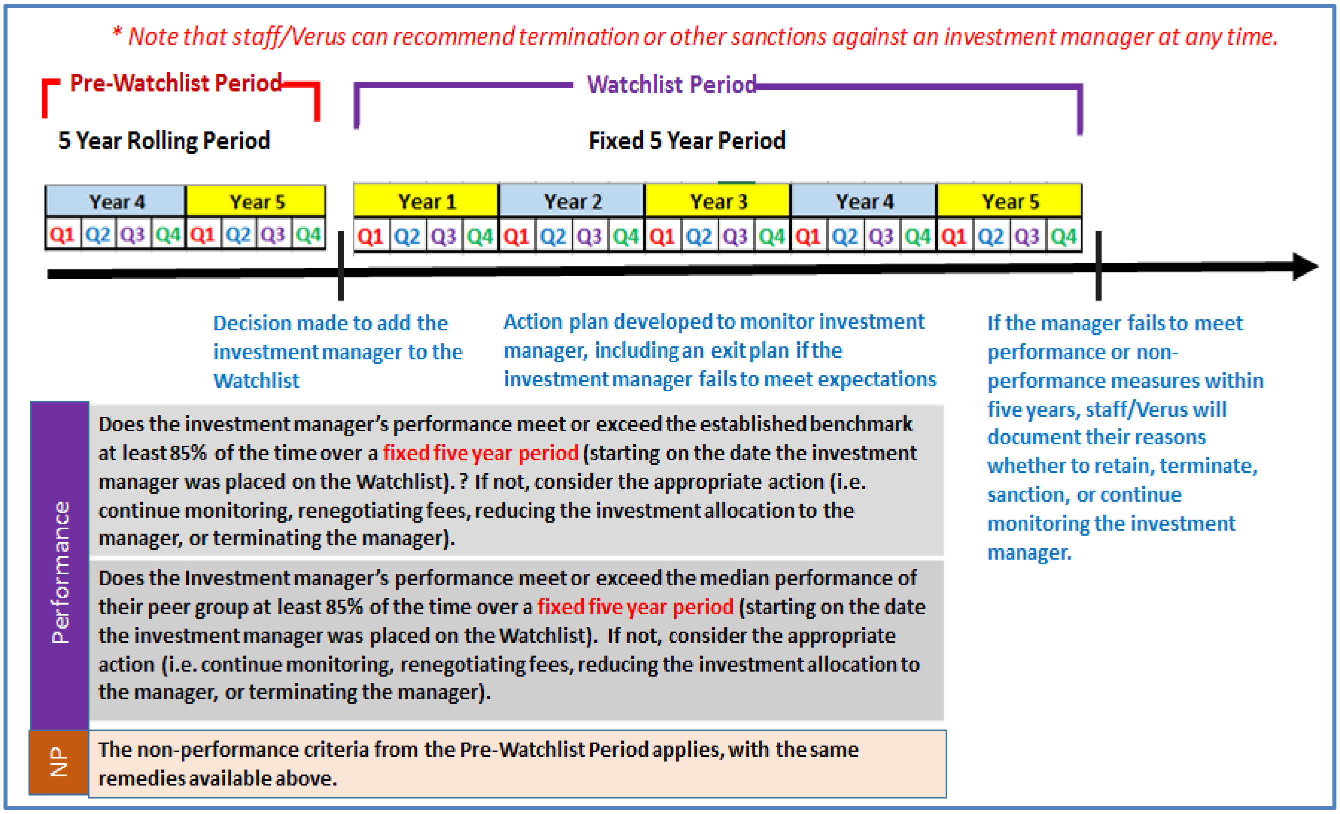
We chose to include the 80% qualifier since we were cautious that some investment managers might have a few quarters of outperformance, but overall have had poor performance. Also, our research indicates a full market cycle to be around 4-5 years. We confirmed this with Investment staff and therefore recommended using a cumulative five year rolling period for the assessment.

Non-Performance Criteria

In addition to the performance criteria mentioned above, non-performance criteria are also applied by staff 100% of the time to ensure the investment manager is in legal compliance and meeting their contractual obligations. Other considerations may include items like excessive fees, key organizational changes, and style deviation). For non-performance issues, staff and Verus can add the investment manager to the Watchlist at any time. Staff and Verus are already reviewing this criterion.

CONTROL 2 - RECOMMENDATION 4: MONITORING INVESTMENT MANAGERS ON THE WATCHLIST

We sampled nineteen investment managers on the Watchlist for the period of 1/1/2013 - 12/31/2017 and found that four investment managers were on the Watchlist 100% of the time; two over 85% of the time; and an additional four were on the Watchlist at least 60% of the time. Note that for the analysis, we aggregated the time spent on the Watchlist and Probation together. Our concern is that members, stakeholders, and third-parties may challenge our trustees about why ACERA didn't take action sooner, and if we didn't take action, what was our reasoning for that. With this in mind, our thought is that we need to demonstrate and document that we analyzed why we are/are not taking action to terminate/remediate, and developed an action plan to monitor the investment manager.



Once an investment manager has been placed on the Watchlist, we recommend a better mechanism for monitoring and determining next steps ACERA should take if the investment manager continues to underperform or remain out of compliance.

Similar to the timeline we are using for an investment manager to be considered to be added to the Watchlist, we are recommending a similar measure, but a fixed five-year period (measured quarterly), starting from the date the investment manager is added to the Watchlist.

The investment manager should meet the performance measures at least 85% of the time over the five years and non-performance measures 100% of the time. If the investment manager fails to meet the measures, staff and Verus can recommend retaining, sanctioning, reducing the allocation, continuing on the Watchlist or terminating the investment manager, but should document their reasons.

One informal recommendation that can be considered by staff is to provide more information to the trustees on the make-up of the peer group for an investment manager, why the investment manager best fits in that specific peer group, and why the investment manager might be outperforming or underperforming compared to its peers.

Another informal recommendation is to consider optimizing the Watchlist reporting process. Currently, the Watchlist results are reported by both Verus (Manager Compliance Checklist) and Staff (Investment Manager's Monthly Report) separately. By consolidating the Watchlist reporting into a single report, and focusing the content of the reporting on alerting the trustees on concerns, possible actions, and recommendations, the trustees can be made aware of significant issues in advance.

CONCLUSION

The overall result of this audit is **In Remediation** since there were recent changes made to the Investment Policy and Watchlist process during the audit. Typically we need sufficient audit data and history after the controls have been implemented before we can opine on the effectiveness of the new controls.

We want to thank the Investment Staff for remediating several aspects of the Watchlist process, before the issuance of the audit report. We have made recommendations for Staff's consideration to improve the overall investment policy language regarding the Watchlist, and to enhance the current set of internal controls to ensure investment managers, who are underperforming over five years or having compliance issues, are carefully monitored.

Once an investment manager has been added to the Watchlist, we recommend that internal action plans be developed to offer possible courses of action if the investment manager continues to underperform or remain out of compliance.

CYBER INSURANCE FRAMEWORK

Alameda County Employees' Retirement Association

BCS Insurance Company

BCS Insurance Company
Protection, Expanded.

AM Best Rating:

Financial Strength Rating View Definition

Rating:	A- (Excellent)
Affiliation Code:	g (Group)
Financial Size Category:	VIII ($100 Million to $250 Million)
Outlook:	Stable
Action:	Affirmed
Effective Date:	May 16, 2019
Initial Rating Date:	June 30, 1958

BCS cyber story:

Syndicates of Lloyds of London created a cyber policy form, and a market changing application process in 2014. This policy was on Lloyds of London paper, but was not admitted (state fund guarantee), so Lloyds of London teamed up with the Blue Cross and Blue Shield subsidiary BCS Insurance Company. By teaming with BCS we were able to file the policy with each state making it eligible for the state guarantee fund. So, the policy is 100% backed by Lloyds of London.

Overview

Trends & Breaches:
The threat of a cyber event occurring has been increasing year over year as hackers create new techniques to intrude an organization's systems, deceive employees into releasing information, and as organizations collect and hold more data.

Compliance & Regulations:
New regulations have increased an organization's exposure to additional expenses after experiencing a breach. Lawmakers want protection for individuals, and find this to be a way generate state revenues.

Policies & Training:
This is crucial in the fight against cyber events occurring. Employees need to be made aware of the exposures, and made aware that this is a priority to the organization.

Trends

Data Growth

Credential Theft/Password Re-use

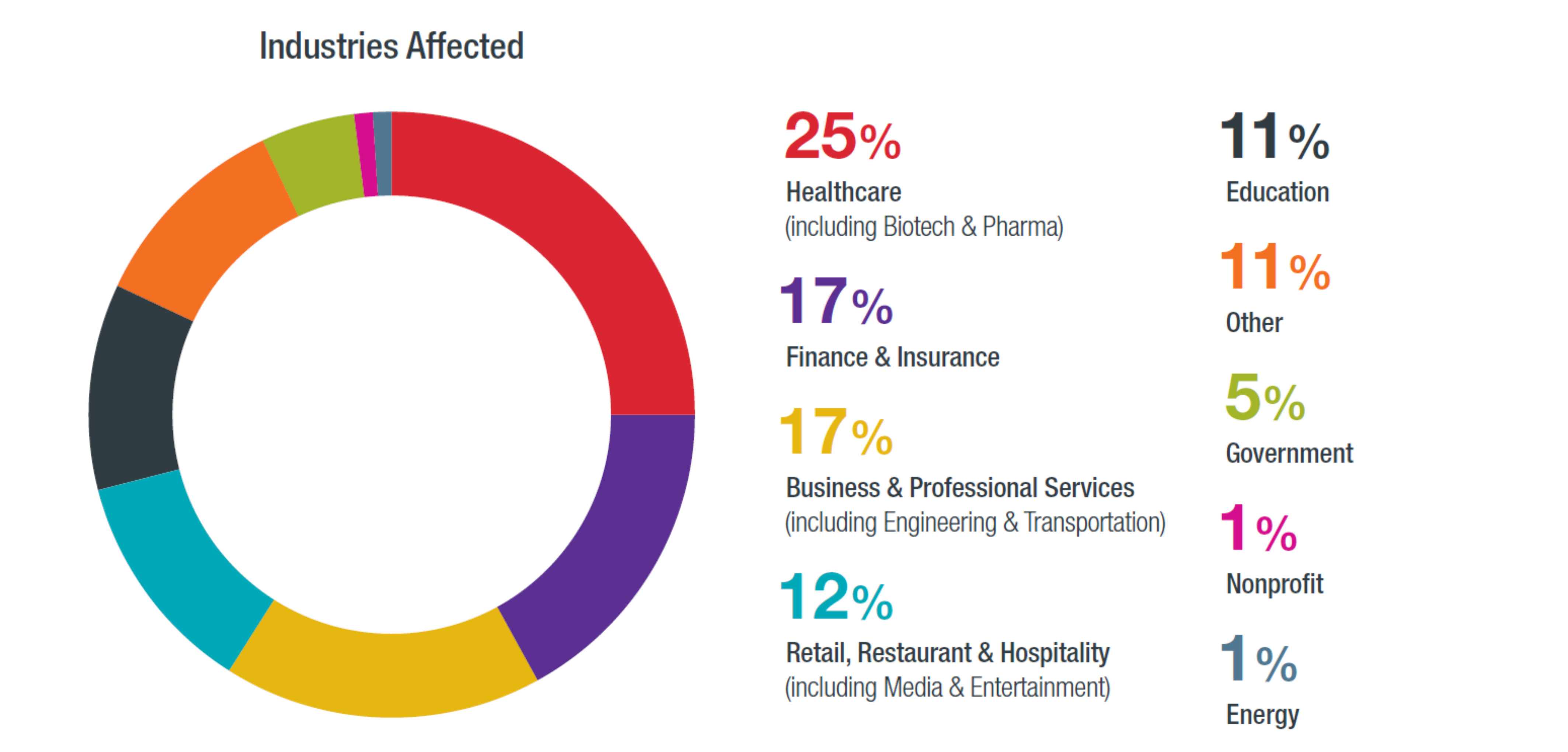
Email/Spearphishing

Intellectual Property Theft

Ransomware/Malware

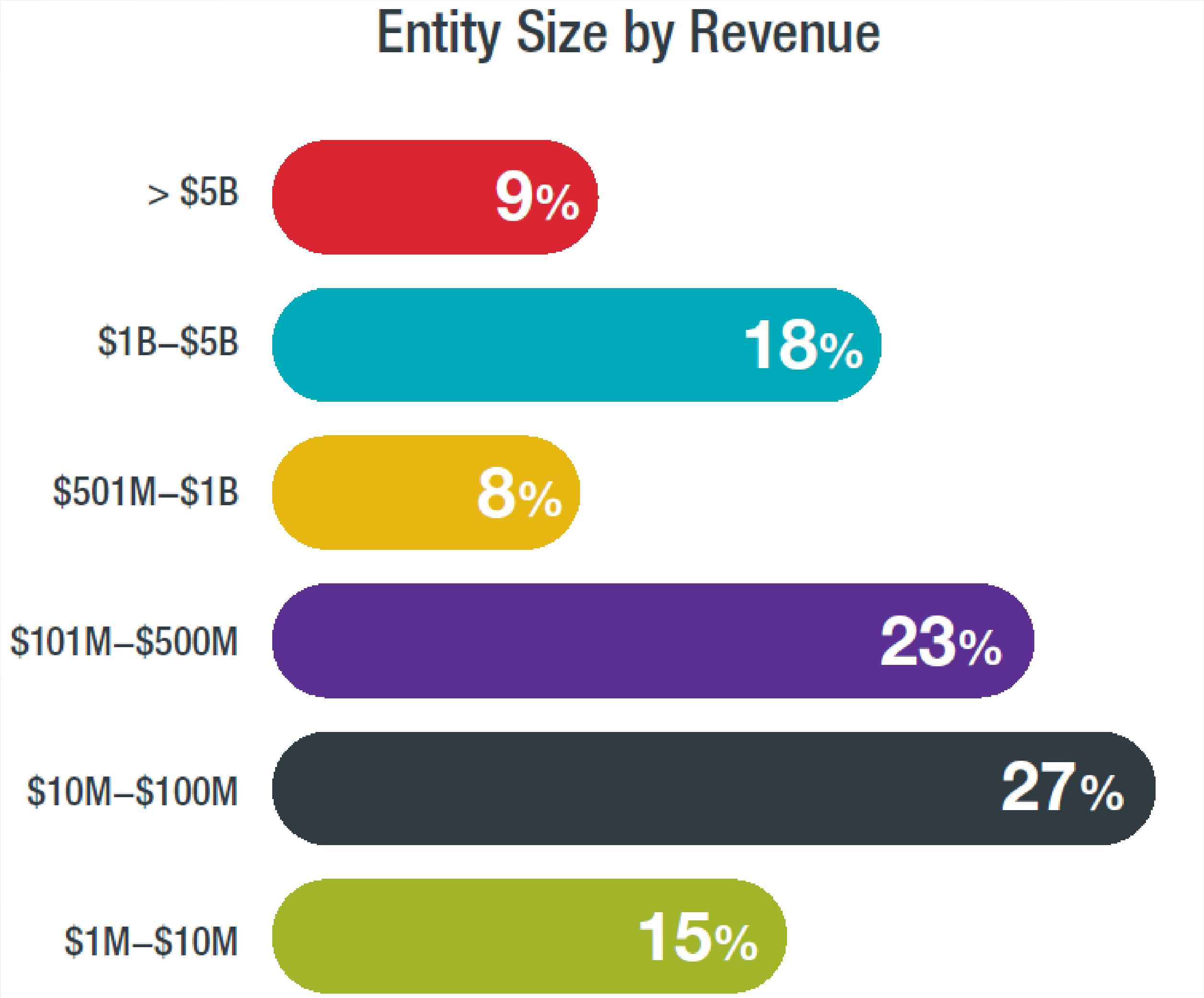
Denial of Service

CYBER BREACHES BY INDUSTRY



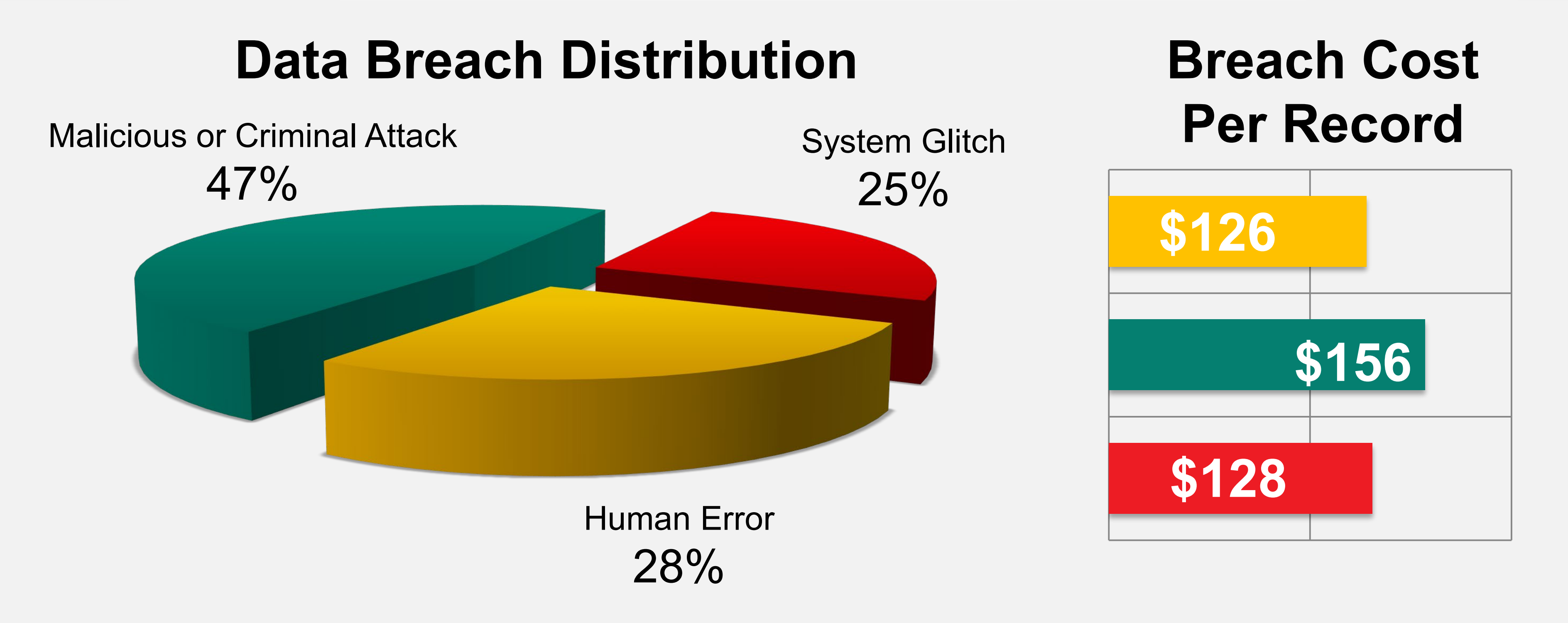
Baker Hostetler 2019 Report

CYBER BREACHES BY REVENUE SIZE



Baker Hostetler 2019 Report

Cause of a Cyber Breach



About 75% all cyber breaches are caused by human error. That is, 28% is "pure" human error and the other 47% is "assisted" human error (i.e., perpetrated through deceitful emails or through other transmissions whereby a code or a hacker encourages employees to create the breach.

COMPLIANCE

State	Law & Effective Date	Electronic Only or Paper Included?	"Personal Information" Definition	Civil or Criminal Penalties?
California	Cal. Civ. Code § 1798.80 et seq. 7/1/03 & 1/1/07 (amended 8/31/11; further amended 1/1/12) Health & Safety Code Section 1280.15 1/1/09 Senate Bill No. 46 (amended 9/27/2013; effective 1/1/2014) Senate Bill No. 34 (effective 1/1/16) Assembly Bill No. 964 (Defines Encryption effective 1/1/16) Assembly Bill No. 2828 (effective 1/1/17)	Electronic	CA plus medical & health insurance information (revised) "username and email address, in combination with a password or security question and answer that would permit access to an online account" (effective 1/1/14)	Yes

California Consumer Privacy Act (CCPA)

The California Department of Justice has stated that it will need to secure more than $57.5 million annually in civil penalties to cover its cost, suggesting the potential for robust enforcement.

"The California AG may bring actions for civil penalties of $2,500 per violation, or up to $7,500 per violation if intentional."

COMPLIANCE

	2015	2018
Introductions	Legislation related to cybersecurity or data security was introduced in at least **26** states	At least **35** states, D.C. and Puerto Rico introduced or considered more than 265 bills or resolutions related to cybersecurity
Enactments	Legislation was enacted in at least **8** states: CA, CT, KS, MD, NJ, NC and TX Executive orders became effective in **8** states	At least **22** states enacted 52 bills in 2018

*National Conference of State Legislature

Policies

Strengthen and clarify the education you give your users, you should clearly outline the requirements and expectations your company has in regards to IT security when you first hire them. Make sure employment contracts and employee handbooks have sections that clearly define these security requirements

Featured Tools

What if Modeling

- Business Interruption Cost Calculator
- Data Breach Cost Calculator
- Notification Cost Calculator
- Public Relations Cost Calculator

Research Tools

- Cause of Loss
- Claim Scenarios
- Fines, Penalties & Settlements
- Privacy Case Law

Breach Notification

- Breach Notification Law Map - United States

Assessment

- Expanded eRisk Self-Assessment
  - *Sample Scorecard*
- Quick eRisk Assessment
  - *Sample Scorecard*
- Security Scorecard

Sample Policies

- Acceptable Use Policy
- Antivirus and Malware Policy
- Computer Network Security Policy Template
- Incident Response Plan Policy
- Information Security Policy
- Mobile Computing Policy
- Personal Device Use (BYOD) Policy
- Physical Security Policy
- Posting and Removal of Online Content
- Sample Information Security Policy Template
- Security Awareness Training and Education Policy
- Security Policy 101 - Essential Policies for Business
- Sensitive Information Handling
- Social Networking Acceptable Use
- Web Site Privacy Policy

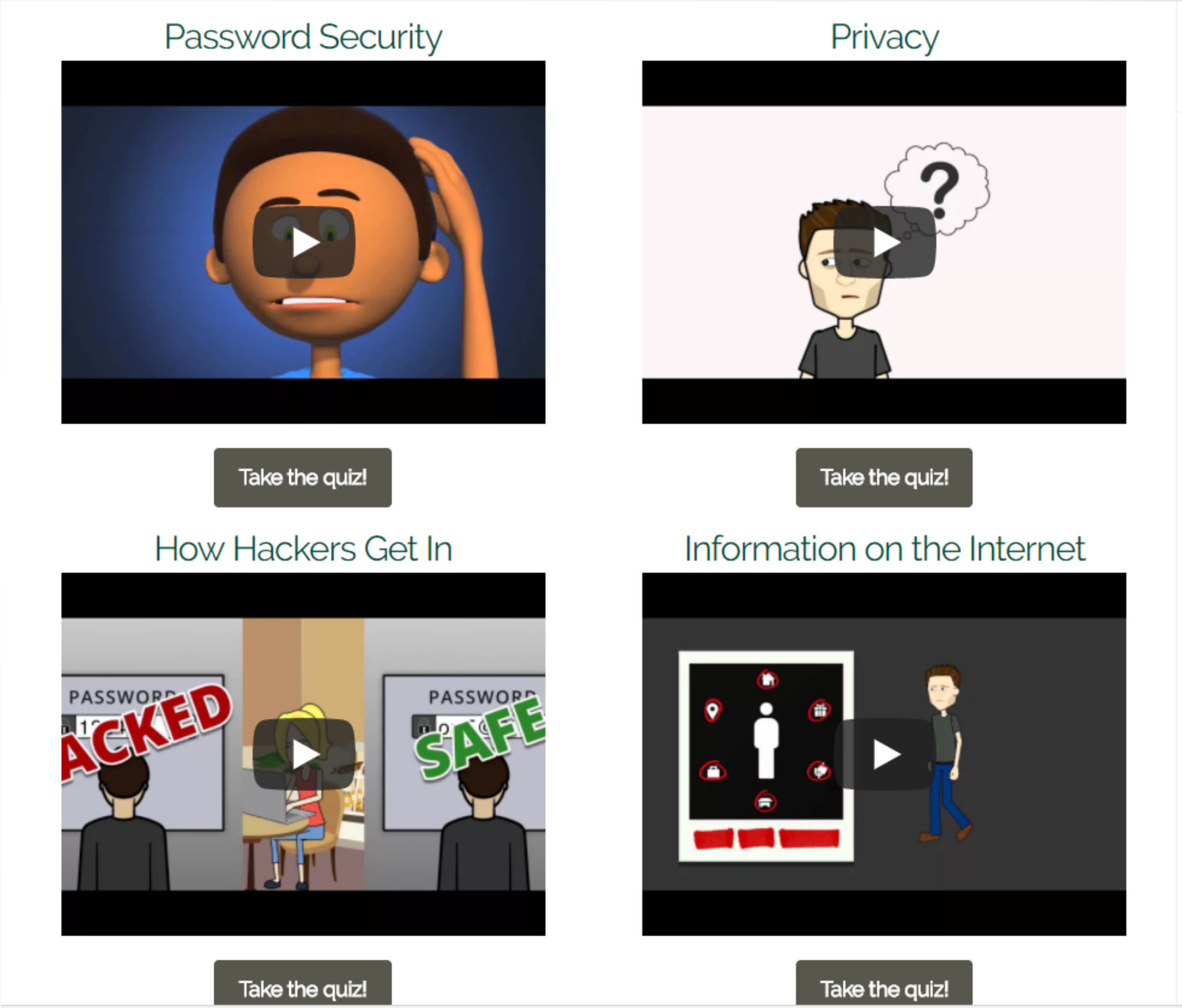
Training

- Understand why you might be a target
- Focus on items you can control
  - Password Management
  - Attachments in Emails
  - Questionable websites/links
  - Storing data in appropriate places
  - What/Where you are plugging into
  - Patching of home systems
- Notify when something is a miss
- Ask someone who knows

Employee Training

Training should include how to:

- recognize a phishing email
- create and maintain strong passwords
- avoid dangerous applications
- ensure valuable information is not taken out of the company in addition to other relevant user security risks.



ACERA’s Cyber Liability Coverage

- Privacy Liability

  Covers the cost associated with a breach for defense and indemnity
- Regulatory Coverage

  Covers fines and penalties from state and federal agencies including HIPPA
- Security Breach Response

  Covers Breach Response costs associated with: IT Forensics, Notifications, PR Firm, Credit Monitoring etc.
- Security Liability

  Suits and costs that arise due to distribution of malicious code

ACERA's Cyber Liability Coverage

- Media Liability

  Coverage applies to your media material for matters such as: Copy write infringement, liable, slander, etc.

- Cyber Extortion

  Coverage for the extorted funds, and the costs associated with securing the network

- Business Income / Digital Restoration

  Reimbursement for the revenue that was lost due to business downtime, and the restoration of digital records

- Payment Card Industry Assessments (PCI)

  PCI fines, penalties, and assessments for loss of credit card information

Benchmark Breakdown

We have provided benchmarking and costs associated with a Cyber event, but we are still in the very early stages of experience. Understanding the exposure, limits, and peers purchasing is limited in the marketplace today. We have created our analysis considering the following areas:

- Potential of record loss – segregated breach to catastrophic
- Potential for class action lawsuits
- Personally Identifiable Information (not considering PCI (payment cards) or PHI (healthcare information)
- Revenue thresholds
- Governmental industry

Benchmarking : 500,000 records breached

Data Breach Costs

INCIDENT INVESTIGATION

FORENSICS INVESTIGATION:	$180,000
SECURITY REMEDIATION:	$200,000
BREACH COACH® LEGAL GUIDANCE:	$72,000
SUBTOTAL:	$452,000

PCI

FINES & PENALTIES:	$0
FRAUD ASSESSMENTS:	$0
CARD REISSUANCE:	$0
SUBTOTAL:	$0

CUSTOMER NOTIFICATION / CRISIS MANAGEMENT

CUSTOMER NOTIFICATION:	$1,500,000
CALL CENTER:	$37,500
CREDIT/ID MONITORING:	$1,625,000
PUBLIC RELATIONS:	$36,000
SUBTOTAL:	$3,198,500

REGULATORY FINES & PENALTIES

STATE AG:	$258,300
HHS:	$0
OTHER (FTC, SEC, ETC.):	$348,750
SUBTOTAL:	$607,050

CLASS ACTION LAWSUIT

DEFENSE:	$208,000
eDISCOVERY:	$720,000
SETTLEMENT/DAMAGES:	$303,000
SUBTOTAL:	$1,231,000

TOTAL COST: **$5,488,550**
PER RECORD COST: **$11**

Cyber Resilience Structure

ASSESS – Identify critical assets, vulnerabilities, gaps, and cyber preparedness

TEST – Test and remediate endpoint risks and Practice your protocols

IMPROVE – Enhance security governance, incident detection, and protocols

QUANTIFY – Pre-determine financial impact due to a cyber incident

RISK TRANSFER – Explore risk transfer solutions to minimize balance sheet risk

RESPOND – Limit business disruption, minimize economic loss, expedite claim