ACERA

Alameda County Employees' Retirement Association
BOARD OF RETIREMENT

ACTUARIAL COMMITTEE/BOARD MEETING NOTICE and AGENDA

[THIS MEETING WILL BE CONDUCTED VIA TELECONFERENCE [SEE EXECUTIVE ORDER N-29-20 ATTACHED AT THE END OF THIS 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, May 20, 2021
11:00 am

LOCATION	COMMITTEE MEMBERS	
The public can view the teleconference and comment via audio during the meeting To join the teleconference, please click the link below: https://zoom.us/join Meeting ID: 848 1155 4030 Password: 191081 For help joining a Zoom meeting, see: https://support.zoom.us/hc/en-us/articles/201362193	**TARRELL GAMBLE, CHAIR**	**APPOINTED**
	OPHELIA BASGAL, VICE CHAIR	**APPOINTED**
	KEITH CARSON	**APPOINTED**
	LIZ KOPPENHAVER	**ELECTED RETIRED**
	GEORGE WOOD	**ELECTED GENERAL**

This is a meeting of the Actuarial Committee if a quorum of the Actuarial Committee attends, and it is a meeting of the Board if a quorum of the Board attends. This is a joint meeting of the Actuarial Committee and the Board if a quorum of each attends.

The order of agenda items is subject to change without notice. Board and Committee agendas and minutes, and all documents distributed to the Board or a Committee in connection with a public meeting (unless exempt from disclosure), 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.

ACTUARIAL COMMITTEE/BOARD MEETING

Call to Order: 11:00 am

Public Input

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

1. Discussion and possible motion to adopt the Actuarial Valuation and Review as of December 31, 2020 (Segal)
   - Margo Allen
   - Andy Yeung, Segal

2. Discussion and possible motion to recommend to the Board that it make the revisions to ACERA's Interest Crediting Policy shown in the redline included with this agenda packet - Jeff Rieger

3. Discussion and possible motion to recommend to the Board that it make the revisions to ACERA's Actuarial Funding Policy shown in the redline included with this agenda packet - Jeff Rieger

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

None

Future Discussion Items

June 2021

- Segal presentation of the deterministic projections based on the Actuarial Valuation and Review as of December 31, 2020

Establishment of Next Meeting Date

June 17, 2021 at 11:00 am

Adjournment

EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA

EXECUTIVE ORDER N-29-20

WHEREAS on March 4, 2020, I proclaimed a State of Emergency to exist in California as a result of the threat of COVID-19; and

WHEREAS despite sustained efforts, the virus continues to spread and is impacting nearly all sectors of California; and

WHEREAS the threat of COVID-19 has resulted in serious and ongoing economic harms, in particular to some of the most vulnerable Californians; and

WHEREAS time bound eligibility redeterminations are required for Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries to continue their benefits, in accordance with processes established by the Department of Social Services, the Department of Health Care Services, and the Federal Government; and

WHEREAS social distancing recommendations or Orders as well as a statewide imperative for critical employees to focus on health needs may prevent Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries from obtaining in-person eligibility redeterminations; and

WHEREAS under the provisions of Government Code section 8571, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay appropriate actions to prevent and mitigate the effects of the COVID-19 pandemic.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California, and in particular, Government Code sections 8567 and 8571, do hereby issue the following order to become effective immediately:

IT IS HEREBY ORDERED THAT:

1. As to individuals currently eligible for benefits under Medi-Cal, CalFresh, CalWORKs, the Cash Assistance Program for Immigrants, the California Food Assistance Program, or In Home Supportive Services benefits, and to the extent necessary to allow such individuals to maintain eligibility for such benefits, any state law, including but not limited to California Code of Regulations, Title 22, section 50189(a) and Welfare and Institutions Code sections 18940 and 11265, that would require redetermination of such benefits is suspended for a period of 90 days from the date of this Order. This Order shall be construed to be consistent with applicable federal laws, including but not limited to Code of Federal Regulations, Title 42, section 435.912, subdivision (e), as interpreted by the Centers for Medicare and Medicaid Services (in guidance issued on January 30, 2018) to permit the extension of

otherwise-applicable Medicaid time limits in emergency situations.

2. Through June 17, 2020, any month or partial month in which California Work Opportunity and Responsibility to Kids (CalWORKs) aid or services are received pursuant to Welfare and Institutions Code Section 11200 et seq. shall not be counted for purposes of the 48-month time limit set forth in Welfare an Institutions Code Section 11454. Any waiver of this time limit shall not be applied if it will exceed the federal time limits set forth in Code of Federal Regulations, Title 45, section 264.1.

3. Paragraph 11 of Executive Order N-25-20 (March 12, 2020) is withdrawn and superseded by the following text:

   Notwithstanding any other provision of state or local law (including, but not limited to, the Bagley-Keene Act or the Brown Act), and subject to the notice and accessibility requirements set forth below, a local legislative body or state body is authorized to hold public meetings via teleconferencing and to make public meetings accessible telephonically or otherwise electronically to all members of the public seeking to observe and to address the local legislative body or state body. All requirements in both the Bagley-Keene Act and the Brown Act expressly or impliedly requiring the physical presence of members, the clerk or other personnel of the body, or of the public as a condition of participation in or quorum for a public meeting are hereby waived.

   In particular, any otherwise-applicable requirements that

   (i) state and local bodies notice each teleconference location from which a member will be participating in a public meeting;

   (ii) each teleconference location be accessible to the public;

   (iii) members of the public may address the body at each teleconference conference location;

   (iv) state and local bodies post agendas at all teleconference locations;

   (v) at least one member of the state body be physically present at the location specified in the notice of the meeting; and

   (vi) during teleconference meetings, a least a quorum of the members of the local body participate from locations within the boundaries of the territory over which the local body exercises jurisdiction

   are hereby suspended.

   A local legislative body or state body that holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, consistent with the notice and accessibility requirements set forth below, shall have satisfied any requirement that the body allow members of the public to attend the meeting and offer public comment. Such a body need not make available any physical location from which members of the public may observe the meeting and offer public comment.

Accessibility Requirements: If a local legislative body or state body holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, the body shall also:

(i) Implement a procedure for receiving and swiftly resolving requests for reasonable modification or accommodation from individuals with disabilities, consistent with the Americans with Disabilities Act and resolving any doubt whatsoever in favor of accessibility; and

(ii) Advertise that procedure each time notice is given of the means by which members of the public may observe the meeting and offer public comment, pursuant to subparagraph (ii) of the Notice Requirements below.

Notice Requirements: Except to the extent this Order expressly provides otherwise, each local legislative body and state body shall:

(i) Give advance notice of the time of, and post the agenda for, each public meeting according to the timeframes otherwise prescribed by the Bagley-Keene Act or the Brown Act, and using the means otherwise prescribed by the Bagley-Keene Act or the Brown Act, as applicable; and

(ii) In each instance in which notice of the time of the meeting is otherwise given or the agenda for the meeting is otherwise posted, also give notice of the means by which members of the public may observe the meeting and offer public comment. As to any instance in which there is a change in such means of public observation and comment, or any instance prior to the issuance of this Order in which the time of the meeting has been noticed or the agenda for the meeting has been posted without also including notice of such means, a body may satisfy this requirement by advertising such means using "the most rapid means of communication available at the time" within the meaning of Government Code, section 54954, subdivision (e); this shall include, but need not be limited to, posting such means on the body's Internet website.

All of the foregoing provisions concerning the conduct of public meetings shall apply only during the period in which state or local public health officials have imposed or recommended social distancing measures.

All state and local bodies are urged to use sound discretion and to make reasonable efforts to adhere as closely as reasonably possible to the provisions of the Bagley-Keene Act and the Brown Act, and other applicable local laws regulating the conduct of public meetings, in order to maximize transparency and provide the public access to their meetings.

IT IS FURTHER ORDERED that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 17th day of March 2020.

GAVIN NEWSOM
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State

MEMORANDUM TO THE ACTUARIAL COMMITTEE

DATE: May 20, 2021

TO: Members of the Actuarial Committee

FROM: Margo Allen, Fiscal Services Officer MA

SUBJECT: Draft Actuarial Valuation and Review as of December 31, 2020

Executive Summary

The draft Actuarial Valuation and Review as of December 31, 2020, is attached for review and discussion. The results of this valuation reflect changes in the economic and demographic assumption as recommended by Segal and adopted by the Board for the December 31, 2020, valuation. As a reminder, the assumed net investment return was reduced from 7.25% to 7.00% and the mortality assumptions were studied on a benefit (amount) weighted basis and strengthened to anticipate longer life expectancies for retired members and beneficiaries. The funded ratio for the December 31, 2020, Valuation Value of Assets (VVA) decreased from a 77.6% to 76.2%, primary the result of the change in economic and demographic assumptions and the loss on the VVA from the recognition of past investment losses after smoothing, offset somewhat by an expected increase due to contributions made to pay down the unfunded liability, higher than expected mortality for continuing retirees, and lower than expected salary increases of actives.

A summary of the Unfunded Actuarial Accrued Liability (UAAL) and the aggregate employer and employee contribution rates from the 2020 funding valuation report are provided here for quick reference.

The UAAL increased from $2,195.0 million in 2019 to $2,500.0 million in 2020. This increase in the UAAL was primarily due to the following factors:

a) The change in economic and demographic assumptions;
b) Lower than expected return on investments (after smoothing); and,
c) Loss due to actual contributions lower than expected[1]; offset somewhat by, the expected decrease due to contributions made to pay down the UAAL, lower than expected salary increases for active members, and higher than expected mortality for continuing retirees.

The aggregate employer contribution rate[2] has increased from 28.47% of payroll to 31.28% of payroll. This change was primarily due to:

a) The change in economic and demographic assumptions;
b) Lower than expected return on investments (after smoothing);
c) Amortizing the prior year's UAAL over a smaller than expected total projected payroll; and,
d) Loss due to actual contributions lower than expected; offset somewhat by, lower than expected salary increases for active members, and higher than expected mortality for continuing retirees.

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[1] Including the scheduled delay in implementing contribution rates after date of valuation

[2] For employers with active member payroll.

The aggregate employee member contribution rate increased from 9.35% of payroll to 9.94% of payroll, mainly due to the changes in economic and demographic assumptions.

Next Step: Prior to bringing the finalized 2020 valuation report back to the actuarial committee at the May 20, 2021 meeting, staff will hold a participating employers meeting on April 28, 2021, to review and discuss the results of the study with employer representatives.

***Reporting Methodology for ASOP No. 51 Implementation*:** In February 2019, the Board adopted staff's recommendation to require Segal to identify risks that "may reasonably be anticipated to significantly affect the plan's future financial condition" (ASOP 51). Based on the Actuarial Valuation and Review as of December 31, 2020, Segal will provide the results of its risk report to the Actuarial Committee on June 17, 2021.

Return Assumption Impact

Similar to what Segal disclosed in ACERA's December 21, 2019, valuation report, the 7.0% investment return assumption that the Board approved on October 15, 2020, for determining the liabilities for funding purposes and used for establishing the employer and member contribution rates in this report has continued to be developed without considering the impact of any future 50/50 excess earnings allocation. This is based on Segal's 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 rate of 7.00%.

As required by the Actuarial Standard of Practice (ASOP) No. 4 ("Measuring Pension Obligations and Determining Pension Plan Costs or Contributions"), Segal performed a stochastic model, as detailed in the 2016-2019 experience study report, to estimate the impact of the 50% allocation of future excess earnings to the SRBR. The results of this 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 this valuation) that would average approximately 0.65% of assets over time. *When the results of the stochastic model are applied to the to this valuation, it is estimated that the annual outflow would increase the Accrued Actuarial Liability (AAL) measured using a 7.00% investment return assumption from $10.48 billion to $11.33 billion (for a difference of $0.85 billion) and would increase the employer's UAAL contribution rate by about 5% - 6% of payroll.*

Recommendation

Staff recommends that the Actuarial Committee recommend to the Board of Retirement that the Board adopt the Actuarial Valuation and Review as of December 31, 2020.

Attachment:

ACERA's draft Actuarial Valuation and Review as of December 31, 2020

Alameda County Employees' Retirement Association

Actuarial Valuation and Review

As of December 31, 2020

This report has been prepared at the request of the Board of Retirement to assist in administering the Fund. 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, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

Segal

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San Francisco, CA 94105-6147
segalco.com
T 415.263.8200

April 6, 2021

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 Actuarial Valuation and Review as of December 31, 2020. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal year 2021-2022.

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

The actuarial calculations were directed under the supervision of 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 this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Association.

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

Sincerely,
Segal

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

JB/

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Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal to present a valuation of the Alameda County Employees' Retirement Association ("the Plan") as of December 31, 2020. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations.

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

The contribution requirements presented in this report are based on:

- The benefit provisions of the pension plan, as administered by the Board of Retirement;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of November 30, 2020, provided by the Retirement Association[1];
- The assets of the Plan as of December 31, 2020, provided by the Retirement Association;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the December 31, 2020 valuation;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. adopted by the Board for the December 31, 2020 valuation and
- The funding policy adopted by the Board of Retirement.

[1] It should be noted that starting with this year's valuation, we have also reflected the actual COLA granted by the Board on the April 1 immediately after the date of the valuation in calculating the liabilities. In the past, we had used the expected COLA in the calculation.

Section 1: Actuarial Valuation Summary

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

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

The contribution requirements are determined as a percentage of payroll.[1] The Association's employer rates provide for both Normal Cost and a contribution to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have applied the funding policy adopted by the Board on September 18, 2014 (and reconfirmed by the Board on October 18, 2018). Details of the funding policy are provided in *Section 4, Exhibit I* starting on page 102.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit H* starting on page 83. A graphical projection of the Unfunded Actuarial Accrued Liability (UAAL) amortization balances and payments has been included in *Section 3, Exhibit I* starting on page 89.

The rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2021 through June 30, 2022.

[1] The contribution requirement for an employer with active member payroll is expressed as a level percentage of payroll for that employer. The contribution requirement for the Alameda County Office of Education with no active member payroll is expressed as a level dollar amount.

Valuation Highlights

1. The results of this valuation reflect changes in the economic and demographic assumptions as recommended by Segal and adopted by the Board for the December 31, 2020 valuation. These changes were documented in our Actuarial Experience Study report dated September 9, 2020 and are also outlined in *Section 4, Exhibit I* of this report. Note in particular that the assumed net investment return was reduced from 7.25% to 7.00% and the mortality assumptions were studied on a benefit (or amount) weighted basis and strengthened to anticipate longer life expectancies for retired members and beneficiaries.

   These assumption changes resulted in an increase in the average employer rate of 2.44% of payroll[1] and an increase in the average member rate of 0.59% of payroll. (The contribution rate impacts are higher for the Safety compared to the General membership group.) Out of the 2.44% of payroll increase in the average employer rate, 0.45% is the increase in the normal cost rate and 1.99% is the increase in the unfunded actuarial accrued liability (UAAL) rate.

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2. In the December 31, 2019 valuation, the ratio of the Valuation Value of Assets (VVA) to Actuarial Accrued Liabilities (AAL) was 77.6%. In this December 31, 2020 valuation, the funded ratio has decreased to 76.2%. The funded ratio if measured on a Market Value of Assets (MVA) basis increased from 79.4% as of December 31, 2019 to 80.0% as of December 31, 2020. The decrease in the VVA funded ratio was primarily the result of the change in economic and demographic assumptions and the loss on the Valuation Value of Assets from the recognition of past investment losses after smoothing, offset somewhat by an expected increase due to contributions made to pay down the unfunded liability, higher than expected mortality for continuing retirees, and lower than expected salary increases for actives. The increase in the MVA funded ratio was the result of the gain on the Market Value of Assets during 2020, offset somewhat by the impact of the change in assumptions. These measurements are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.

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3. The Association's UAAL as of December 31, 2019 was $2,195.0 million. In this year's valuation, the UAAL has increased to $2,500.0 million. The increase in the UAAL was primarily due to (a) the change in economic and demographic assumptions, (b) lower than expected return on investments after smoothing (due to recognition of the market loss during the first 6-month period of 2020), and (c) the loss due to actual contributions lower than expected[2], offset somewhat by (d) the expected decrease due to contributions made to pay down the UAAL, (e) lower than expected salary increases for active members, and (f) higher than expected mortality for continuing retirees. A reconciliation of the Association's UAAL is provided in *Section 2, Subsection E*. A schedule of the current UAAL amortization amounts may be found in *Section 3, Exhibit H*. Note that a graphical projection of the UAAL amortization bases and payments has been included in *Section 3, Exhibit I.*

[1] In addition, the assumption changes resulted in an increase in the level dollar contribution for the Alameda County Office of Education by $18K when made on April 1, 2022.

[2] Including scheduled lag in implementing contribution rates after the date of the valuation.

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4. The average employer rate[1] calculated in this valuation has increased from 28.47% of payroll to 31.28% of payroll. This change was primarily due to (a) the change in economic and demographic assumptions, (b) lower than expected return on investments after smoothing (due to recognition of the market loss during the first 6-month period of 2020), (c) the effect of amortizing the prior year's UAAL over a smaller than expected total projected payroll, and (d) actual contributions lower than expected, offset somewhat by (e) higher than expected mortality for continuing retirees, and (f) lower than expected salary increases for active members. A reconciliation of the Association's average employer rate is provided in *Section 2, Subsection F*.

   A schedule of the projected contributions by each participating employer is provided in *Section 4, Exhibit IV*. Under the Board of Retirement's current actuarial funding policy, the UAAL is paid off by the employers in the General Tiers 1, 2, and 4 membership group in proportion to their payroll (with the exception of the Alameda County Office of Education and the Livermore Area Recreation and Parks District, as discussed in item 8 below).

   Employer rates for AHS/Court/First 5 are higher than the County's rates to reflect that only the County has received a reimbursement for the implicit retiree health benefit subsidy paid by the County for 2020 and in the prior years. The $7.5 million transfer (an estimated amount provided by ACERA for the implicit retiree health benefit subsidy paid by the County for 2020) and the unused credit from prior years' transfers (the balance of prior transfers was about $76.6 million[2] as of December 31, 2020) have been recognized over separate 20-year periods.

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5. The average member rate calculated in this valuation increased from 9.35% of payroll as of December 31, 2019 to 9.94% of payroll as of December 31, 2020 mainly due to the change in economic and demographic assumptions. A reconciliation of the Association's average member rate is provided in *Section 2, Subsection F*.

   The individual member rates have been updated to reflect the valuation as of December 31, 2020. The detailed member rates are provided in *Section 4, Exhibit III* of this report.

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6. As indicated in *Section 2, Subsection B* of this report, the total unrecognized net investment gain as of December 31, 2020 is $643.3 million (in the previous valuation, this amount was a $260.7 million net gain). This net investment gain will be recognized in the determination of the Actuarial Value of Assets for funding purposes in the next few years, and will offset any investment losses that may occur after December 31, 2020. This implies that if the Association earns the assumed net rate of investment return of 7.00% per year on a **market value basis**, it will result in investment gains on the Actuarial Value of Assets in the next few years. So, if the actual market return is equal to the assumed 7.00% rate and all other actuarial assumptions are met, the contribution requirements would generally decrease in the next few years.

   The net deferred gain of $643.3 million represents 6.7% of the Market Value of Assets as of December 31, 2020. Unless offset by future investment losses or other unfavorable experience, the recognition of the $643.3 million deferred market gain is

[1] For employers with active member payroll.
[2] See *Section 4, Exhibit V* for a schedule of the outstanding balances of the unused credit.

expected to have an impact on the Association's future funded percentage and contribution rate requirements. Under an approach which takes into account the size of the valuation and the SRBR reserves,[1] this potential impact may be illustrated as follows:

a. If a proportion of the net deferred gain that is commensurate with the size of the valuation reserves were recognized immediately in the valuation value of assets, the funded percentage would increase from 76.2% to 80.0%.

b. If a proportion of the net deferred gain that is commensurate with the size of the valuation reserves were recognized immediately in the valuation value of assets, the average employer rate[2] would decrease from 31.28% to about 28.8% of payroll.

7. Similar to what we disclosed in our December 31, 2019 valuation report, the 7.00% investment return assumption that the Board approved on October 15, 2020 for determining the liabilities for funding purposes and used for establishing the employer and member contribution rates in this report 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 7.00%.

   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, as detailed in our 2016-2019 experience study report, 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 this valuation) that would average approximately 0.65% of assets over time. **For informational purposes only**, when we applied the results of our stochastic model to this valuation, we have estimated that such an annual outflow would increase the AAL measured in this valuation using a 7.00% investment return assumption from $10.48 billion to $11.33 billion (for a difference of $0.85 billion) and would increase the employer's UAAL contribution rate by about 5% - 6% of payroll.

8. The Board adopted the Declining Employer Payroll Policy on October 18, 2018 and determined that the policy applies to the Alameda County Office of Education (ACOE) and the Livermore Area Recreation and Parks District (LARPD) Tier 1 members who were included as part of the General cost group in prior valuations. As a result, an unfunded actuarial accrued liability (UAAL) was allocated to each of these two employers as of December 31, 2017.

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9. The Actuarial Standards Board approved Actuarial Standard of Practice No. 51 (ASOP 51) regarding risk assessment, which was first effective with ACERA's December 31, 2018 actuarial valuation. ASOP 51 requires actuaries to identify risks that "may

[1] The Market Value of Assets as of December 31, 2020 equals the Valuation Value of Assets plus one-half of the deferred market gains after adjustment to include the balance in the Contingency Reserve.

[2] For employers with active member payroll.

reasonably be anticipated to significantly affect the plan's future financial condition". Investment risk, asset/liability mismatch risk, interest rate risk, longevity and other demographic risks and contribution risk are also cited as examples in ASOP 51. The Standard does not require the actuary to evaluate the likelihood of contributing entities to make contributions when due, nor does it require the actuary to assess the likelihood or consequences of future changes in applicable law.

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

A copy of the risk assessment report including the analysis recommended by Segal in consultation with ACERA staff will be available later in 2021.

10. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. The funding policy adopted by the Board meets this standard.

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11. The actuarial loss from investment and other experience is $34.1 million, or 0.3% of actuarial accrued liability.

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12. The net experience gain from sources other than investments and contributions is $35.1 million, or 0.3% of the actuarial accrued liability. This gain is primarily due to higher than expected mortality experience for continuing retirees and lower than expected individual salary increases for actives.

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13. The rate of return on the market value of assets was 11.50% for the 2020 plan year. The return on the valuation value of assets was 6.50% for the same period due to the recognition of prior years' investment gains and losses. This resulted in an actuarial loss when measured against the assumed rate of return of 7.25% for the 2020 plan year. This actuarial investment loss increased the average employer contribution rate by 0.35% of payroll.

14. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution under the Plan's funding policy and measuring the progress of that funding policy. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68, for inclusion in the plan and employer's financial statements as of December 31, 2020 will be provided separately. The accounting disclosures will utilize different methodologies from those employed in the funding valuation, as required by the GASB. However, the actuarially determined contribution in this valuation is expected to be used as the actuarially determined contribution (ADC) for GASB financial reporting.

15. This actuarial report as of December 31, 2020 is based on financial data as of that date and demographic data as of November 30, 2020. Changes subsequent to that date are not reflected and will affect future actuarial costs of the plan.
16. It is important to note that this actuarial valuation is based on plan assets as of December 31, 2020. Due to the COVID-19 pandemic, market conditions have changed significantly since the onset of the Public Health Emergency. The plan's funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the plan year. Moreover, this actuarial valuation does not include any possible short-term or long-term impacts on mortality of the covered population that may emerge after December 31, 2020. While it is impossible to determine how the pandemic will affect market conditions and other demographic experience of the plan in future valuations, Segal is available to prepare projections of potential outcomes upon request.
17. On July 30, 2020, the California Supreme Court issued a decision in the case of Alameda County Deputy Sheriffs' Association et al. v. Alameda County Employees' Retirement Association and Board of Retirement of ACERA. Following the Supreme Court decision, we asked ACERA for direction on whether the Supreme Court decision on compensation earnable is expected to have an impact on the pay elements that we have used in our analysis of the Additional Cashout[1] assumption during our 2016-2019 experience study. We were informed that the decision will not affect the Additional Cashout pay elements for Legacy members. Also, ACERA further indicated that they "will await the Trial Court ruling to determine any future changes which should be minor and only impact a few pay items." In early March 2021, ACERA informed us that there were no new updates on the Trial Court ruling. It should be noted that neither the December 31, 2020 assets provided by ACERA nor the liabilities we calculated using the membership data provided by ACERA reflect the financial impact of the Supreme Court decision, if any.

[1] The Additional Cashout assumption was previously referred to as the Terminal Pay assumption in our actuarial reports.

Summary of Key Valuation Results

		December 31, 2020		December 31, 2019	
		Total Rate	Estimated Annual Dollar Amount[1] ($ in '000s)	Total Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Employer Contribution Rates:[2]	**County Only**				
	• General Tier 1	25.54%	$1,584	22.90%	$1,420
	• General Tier 2	24.05	91,282	21.92	83,197
	• General Tier 4	23.79	58,520	21.43	52,716
	• Safety Tier 1	88.95	436	83.07	408
	• Safety Tier 2	69.15	75,923	63.66	69,896
	• Safety Tier 2C	73.87	2,133	64.94	1,875
	• Safety Tier 2D	69.83	11,566	63.31	10,486
	• Safety Tier 4	66.52	33,441	60.49	30,410
	County Combined	33.86	274,885	30.84	250,408
	AHS, Court & First 5 Only				
	• General Tier 1	26.48	310	23.77	278
	• General Tier 2	24.99	44,860	22.79	40,912
	• General Tier 4	24.73	38,225	22.30	34,469
	Housing Only				
	• General Tier 1	31.72	970	28.97	887
	• General Tier 2	30.23	74	27.99	69
	• General Tier 4	29.97	507	27.50	466
	LARPD Only[3]				
	• General Tier 1	42.96	231	38.07	204
	• General Tier 3	48.02	851	43.82	777
	• General Tier 4	41.21	570	36.60	506
	All Categories Combined	**31.28**	**361,483**	**28.47**	**328,976**

[1] Based on December 31, 2020 projected annual compensation.
[2] For employers with active member payroll. The UAAL contribution for ACOE, expressed as a level dollar amount, is $100 K when made on April 1, 2022.
[3] For LARPD, the combined rate is 44.72% as of December 31, 2020 and 40.26% as of December 31, 2019.

Section 1: Actuarial Valuation Summary

		December 31, 2020		December 31, 2019	
		Total Rate	Estimated Annual Dollar Amount[1] ($ in '000s)	Total Rate[2]	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Member Contribution Rates:	• General Tier 1	9.86%	$1,081	9.59%	$1,052
	• General Tier 2	8.22	45,976	7.65	42,788
	• General Tier 3	15.00	266	14.07	249
	• General Tier 4	9.21	37,175	8.85	35,722
	• Safety Tier 1	3.00	15	3.00	15
	• Safety Tier 2	16.95	18,610	15.89	17,446
	• Safety Tier 2C	14.65	423	13.29	384
	• Safety Tier 2D	17.17	2,844	16.02	2,653
	• Safety Tier 4	16.93	8,511	15.42	7,752
	All Categories Combined	**9.94**	**114,901**	**9.35**	**108,061**

[1] Based on December 31, 2020 projected annual compensation.
[2] Average rates have been recalculated by applying the individual entry age based member rates determined in the December 31, 2019 valuation to the Association membership as of December 31, 2020.

Summary of Key Valuation Results (continued)

		December 31, 2020 ($ in '000s)	December 31, 2019 ($ in '000s)
Actuarial Accrued Liability as of December 31:	• Retired members and beneficiaries	$6,437,400	$6,006,226
	• Inactive vested members	293,106	260,753
	• Active members	3,753,674	3,528,040
	• Total Actuarial Accrued Liability[1]	$10,484,180	$9,795,019
	• Normal Cost for plan year beginning December 31	$240,762	$224,598
Assets as of December 31:	• Valuation Value of Assets (VVA)[2]	$7,984,241	$7,599,977
	• Market Value of Assets (MVA)[3]	8,389,373	7,774,898
	• Valuation Value of Assets as a percentage of Market Value of Assets	95.2%	97.8%
Funded status as of December 31:	• Unfunded Actuarial Accrued Liability on Valuation Value of Assets basis	$2,499,939	$2,195,042
	• Funded percentage on VVA basis	76.2%	77.6%
	• Unfunded Actuarial Accrued Liability on Market Value of Assets basis	$2,094,807	$2,020,121
	• Funded percentage on MVA basis	80.0%	79.4%
	• Amortization period[4]	Varies	Varies
Key assumptions:	• Net investment return	7.00%	7.25%
	• Price Inflation	2.75%	3.00%
	• Payroll growth increase	3.25%	3.50%

1 Excludes liabilities held for SRBR and other non-valuation reserves.
2 Excludes Reserve for Interest Fluctuations (Contingency Reserve) if positive, Supplemental Retirees Benefit Reserve, and 401(h) Reserve.
3 The Market Value of Assets as of December 31, 2020 equals the Valuation Value of Assets plus one-half of the deferred market gains after adjustment to include the balance in the Contingency Reserve. The Market Value of Assets as of December 31, 2019 equals the Valuation Value of Assets plus one-half of the deferred market gains after adjustment to include the balance in the Contingency Reserve.
4 New UAAL established on each valuation after December 31, 2011 are amortized as follows: 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.

Summary of Key Valuation Results (continued)

		December 31, 2020	December 31, 2019	Change From Prior Year
Demographic data as of December 31:	**Active Members:**			
	• Number of members	11,322	11,336	-0.1%
	• Average age	47.1	47.1	0.0
	• Average service	11.3	11.3	0.0
	• Total projected compensation	$1,155,697,000	$1,129,175,000	2.3%
	• Average projected compensation	$102,075	$99,610	2.5%
	Retired Members and Beneficiaries:			
	• Number of members:			
	– Service retired	8,076	7,888	2.4%
	– Disability retired	971	951	2.1%
	– Beneficiaries	1,245	1,239	0.5%
	– Total	10,292	10,078	2.1%
	• Average age	72.1	71.9	0.2
	• Average monthly benefit[1]	$4,244	$4,111	3.2%
	Inactive Vested Members:			
	• Number of members[2]	3,028	2,821	7.3%
	• Average Age	47.4	47.3	0.1
	Total Members:	24,642	24,235	1.7%

[1] Excludes monthly benefits payable from the SRBR.
[2] Includes inactive members due a refund of member contributions.

Important Information About Actuarial Valuations

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

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

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the Association. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the Association. The Association uses a “valuation value of assets” that differs from market value to gradually reflect six-month changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results that does not mean that the previous assumptions were unreasonable.
Models	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Section 1: Actuarial Valuation Summary

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

The actuarial valuation is prepared at the request of the Association. Segal is not responsible for the use or misuse of its report, particularly by any other party.

An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:

- Differences between actual experience and anticipated experience;
- Changes in actuarial assumptions or methods;
- Changes in statutory provisions; and
- Differences between the contribution rates determined by the valuation and those adopted by the Board.

Some actuarial results in this report are not rounded, but that does not imply precision.

If the Association is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.

Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Association should look to their other advisors for expertise in these areas.

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

Section 2: Actuarial Valuation Results

A. Member Data

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

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

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

Member Population: 2011 – 2020

Year Ended December 31	Active Members	Inactive Vested Members[1]	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2011	10,724	1,796	7,906	9,702	0.90	0.74
2012	10,800	1,835	8,175	10,010	0.93	0.76
2013	10,877	1,902	8,566	10,468	0.96	0.79
2014	11,025	1,995	8,813	10,808	0.98	0.80
2015	11,071	2,027	8,990	11,017	1.00	0.81
2016	11,111	2,263	9,242	11,505	1.04	0.83
2017	11,323	2,447	9,479	11,926	1.05	0.84
2018	11,349	2,568	9,783	12,351	1.09	0.86
2019	11,336	2,821	10,078	12,899	1.14	0.89
2020	11,322	3,028	10,292	13,320	1.18	0.91

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

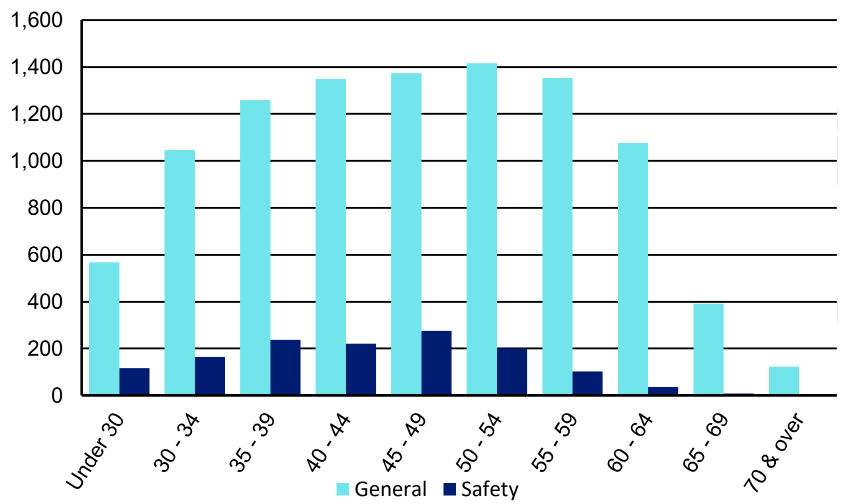
Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 11,322 active members with an average age of 47.1, average years of service of 11.3 and average compensation of $102,075. The 11,336 active members in the prior valuation had an average age of 47.1, average service of 11.3 and average compensation of $99,610.

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

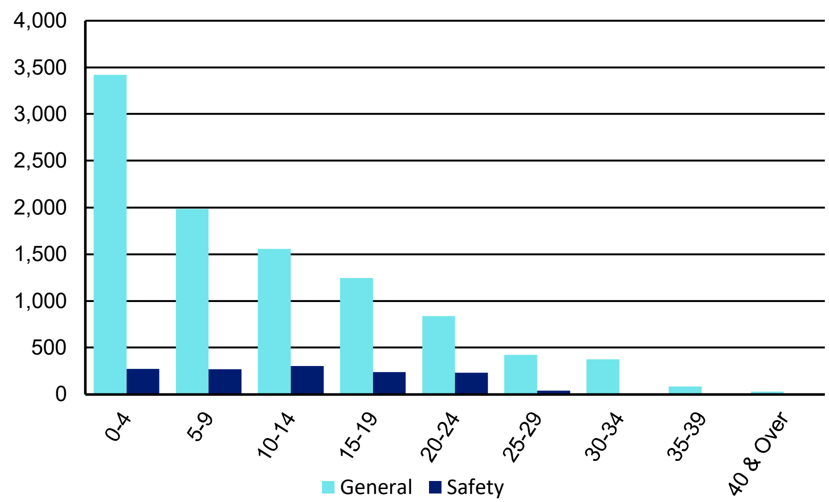
Distribution of Active Members as of December 31, 2020

Actives by Age



Average age	47.1
Prior year average age	47.1
Difference	0.0

Actives by Years of Service



Average years of service	11.3
Prior year average years of service	11.3
Difference	0.0

Inactive Members

In this year's valuation, there were 3,028 members with a vested right to a deferred or immediate vested benefit or entitled to a refund of their member contributions, versus 2,821 members in the prior valuation.

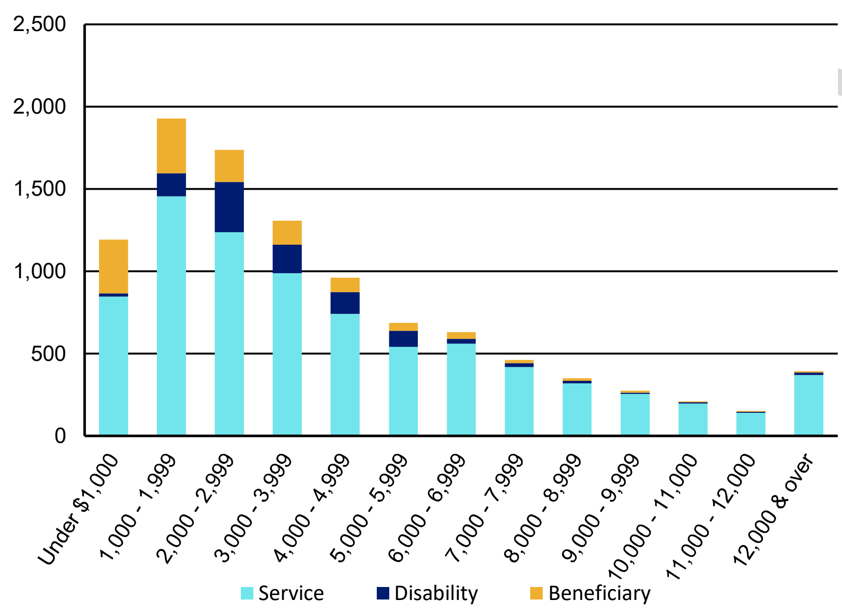
Retired Members and Beneficiaries

As of December 31, 2020, 9,047 retired members and 1,245 beneficiaries were receiving total monthly benefits of $43,674,712. For comparison, in the previous valuation, there were 8,839 retired members and 1,239 beneficiaries receiving monthly benefits of $41,427,406. These monthly benefits exclude supplemental COLA benefits payable from the Supplemental Retirees Benefit Reserve (SRBR).

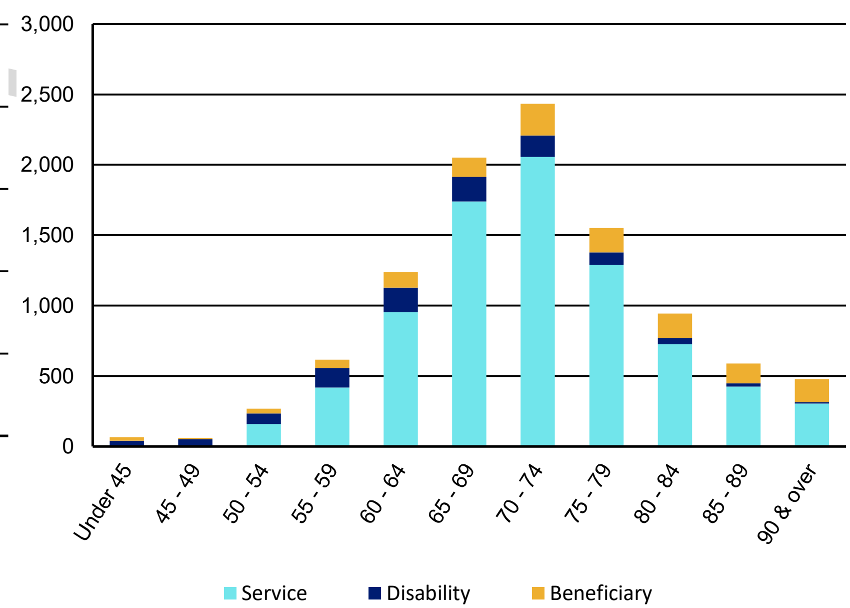
As of December 31, 2020, the average monthly benefit for retired members is $4,473, compared to $4,344 in the previous valuation. The average age for retired members is 71.6 in the current valuation, compared with 71.3 in the prior valuation. For beneficiaries as of December 31, 2020, the average monthly benefit is $2,575, compared to $2,448 in the previous valuation. The average age for beneficiaries is 75.6 in the current valuation, compared with 75.5 in the prior valuation.

Distribution of Retired Members and Beneficiaries as of December 31, 2020

Retired Members and Beneficiaries by Type and Monthly Amount



Retired Members and Beneficiaries by Type and Age



Historical Plan Population

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

Member Data Statistics: 2011 – 2020

	Active Members			Retired Members and Beneficiaries		
Year Ended December 31	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2011	10,724	47.7	11.8	7,906	70.5	$3,190
2012	10,800	47.6	11.8	8,175	70.6	3,332
2013	10,877	47.3	11.5	8,566	70.7	3,442
2014	11,025	47.3	11.5	8,813	70.9	3,549
2015	11,071	47.3	11.6	8,990	71.1	3,648
2016	11,111	47.3	11.6	9,242	71.3	3,757
2017	11,323	47.1	11.4	9,479	71.6	3,880
2018	11,349	47.0	11.4	9,783	71.7	3,983
2019	11,336	47.1	11.3	10,078	71.9	4,111
2020	11,332	47.1	11.3	10,292	72.1	4,244

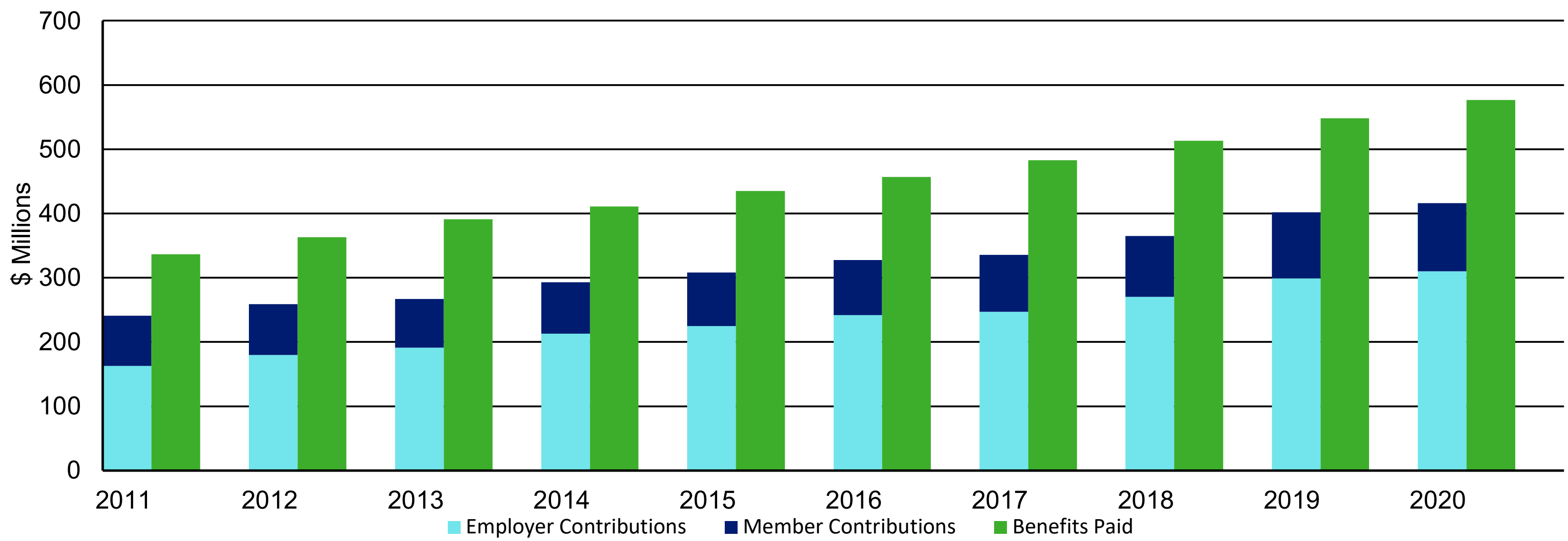
B. Financial information

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

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

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

Comparison of Contributions Made with Benefits Paid for Years Ended December 31, 2011 – 2020



Determination of Actuarial Value of Assets for Year Ended December 31, 2020

1	**Market value of assets**							**$9,629,767,350**
2	Calculation of unrecognized return							
	Six Month Period		**Actual**	**Expected**	**Investment**	**Percent**	**Deferred**	
	From	**To**	**Return[1]**	**Return[1]**	**Gain (Loss)**	**Deferred**	**Return**	
a)	1/1/2016	6/30/2016	$75,639,795	$251,178,961	$(175,539,165)	0%	$0	
b)	7/1/2016	12/31/2016	379,000,419	251,534,721	127,465,699	10	12,746,570	
c)	1/1/2017	6/30/2017	658,890,554	263,335,665	395,554,890	20	79,110,978	
d)	7/1/2017	12/31/2017	634,431,651	285,557,601	348,874,050	30	104,662,215	
e)	1/1/2018	6/30/2018	86,346,238	306,788,550	(220,442,312)	40	(88,176,925)	
f)	7/1/2018	12/31/2018	(457,457,856)	293,029,561	(750,487,417)	50	(375,243,709)	
g)	1/1/2019	6/30/2019	854,836,642	274,040,816	580,795,826	60	348,477,495	
h)	7/1/2019	12/31/2019	487,958,159	302,301,626	185,656,533	70	129,959,573	
i)	1/1/2020	6/30/2020	(507,044,977)	317,318,139	(824,363,116)	80	(659,490,493)	
j)	7/1/2020	12/31/2020	1,508,460,094	295,971,205	1,212,488,889	90	1,091,240,000	
k)	Total unrecognized return[2]							$643,285,705
3	Calculation of Preliminary Actuarial Value of Assets							
a)	Preliminary Actuarial Value of Assets: **(1) - (2k)**							$8,986,481,645
b)	Preliminary Actuarial Value as a Percentage of Market Value: **(3a) ÷ (1)**							93.3%
4	Adjustment to be within 40% corridor							0
5	**Final Actuarial value of assets: (3a) + (4)**							**$8,986,481,645**
6	Non-valuation reserves and deductions							
a)	Reserve for Interest Fluctuations (Contingency Reserve), but no less than $0							$68,984,336
b)	Supplemental Retirees Benefit Reserve (SRBR)							931,754,157
c)	Other Non-Valuation Reserve (401(h) Reserve)							9,051,620
d)	SRBR Transfer to Employer Advance Reserve							-7,548,683
e)	Subtotal							$1,002,241,430
7	**Final Valuation Value of Assets: (5) – (6e)**							**$7,984,240,215**

Note: Results may be slightly off due to rounding.

[1] The actual return on a market value basis is calculated by taking the difference between the ending and beginning Market Value of Assets over the last six month period and adjusting that difference for the non-investment cash flows. Those cash flows include contributions received and benefit payments made during that six month period. The amount subject to smoothing is determined as the actual market return earned during the last six month period that was in excess/below the expected return.

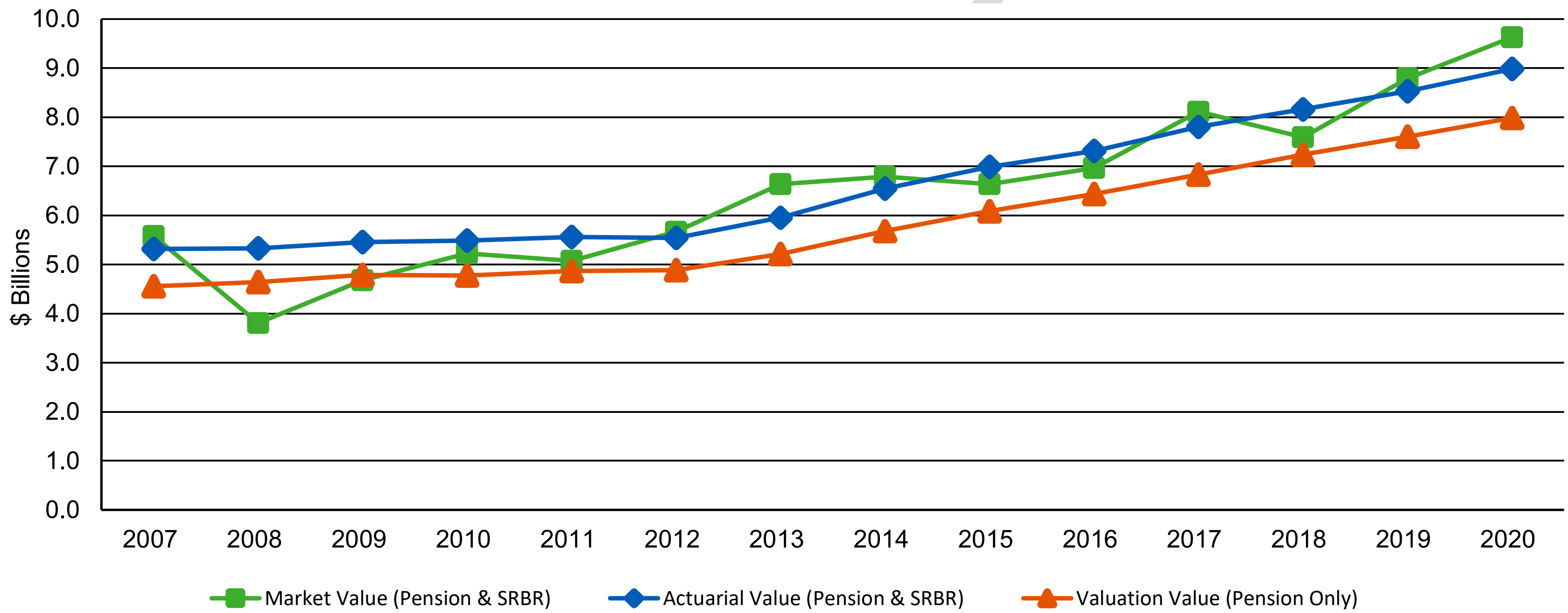
[2] Deferred return as of December 31, 2020 recognized in each of the next five years:

(a)	Amount recognized on December 31, 2021	$198,362,038
(b)	Amount recognized on December 31, 2022	71,617,085
(c)	Amount recognized on December 31, 2023	155,866,885
(d)	Amount recognized on December 31, 2024	96,190,808
(e)	Amount recognized on December 31, 2025	121,248,889
(f)	Total unrecognized return as of December 31, 2020	$643,285,705

Section 2: Actuarial Valuation Results

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

Market Value, Actuarial Value, and Valuation Value of Assets as of December 31, 2007 – 2020



C. Actuarial experience

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

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

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total loss is $34.1 million, which includes $56.5 million from investment losses and a loss of $12.6 million from contribution experience, offset partly by $35.1 million in gains from all other sources. The net experience variation from individual sources other than investments and contributions was 0.3% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

Actuarial Experience for Year Ended December 31, 2020

1	Net loss from investments[1]	$(56,539,000)
2	Net loss from contributions	(12,623,000)
3	Net gain from other experience[2]	35,107,000
4	**Net experience loss: 1 + 2 + 3**	**$(34,055,000)**

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

Investment experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the market value of assets was 11.50% for the year ended December 31, 2020.

For valuation purposes, the assumed rate of return on the valuation value of assets was 7.25% for the 2020 plan year[1]. The actual rate of return on a valuation basis for the 2020 plan year was 6.50%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended December 31, 2020 with regard to its investments.

Investment Experience for Year Ended December 31, 2020

		Market Value	Actuarial Value	Valuation Value
1	Net investment income	$1,001,415,117	$618,817,861	$490,338,431
2	Average value of assets	8,708,815,642	8,448,127,193	7,543,132,522
3	Rate of return: **1 ÷ 2**	11.50%	7.32%	6.50%
4	Assumed rate of return	7.25%	7.25%	7.25%
5	Expected investment income: **2 x 4**	$631,389,134	$612,489,221	$546,877,108
6	**Actuarial gain/(loss): 1 - 5**	**$370,025,983**	**$6,328,640**	**$(56,538,677)**

[1] Based on the investment return assumption from the December 31, 2019 valuation.

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

Investment Return – Market Value, Actuarial Value and Valuation Value: 2011 – 2020

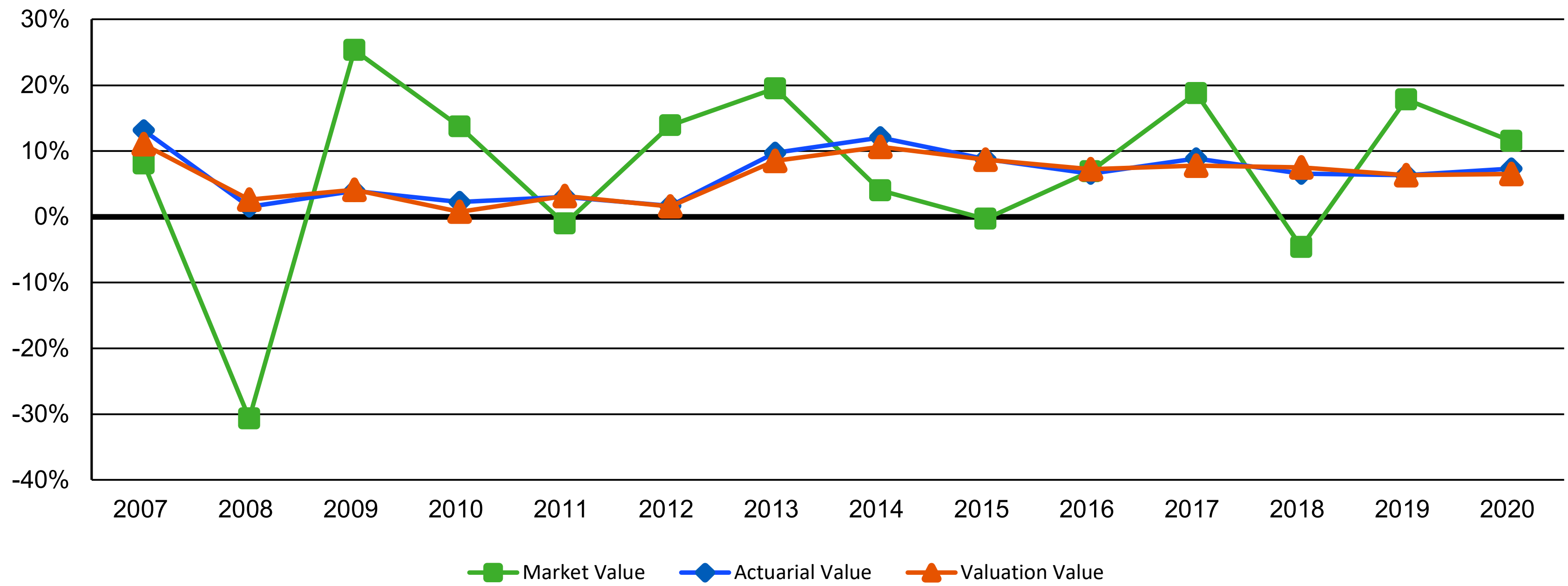
	Market Value Investment Return[1]		Actuarial Value Investment Return[1]		Valuation Value Investment Return[1]	
Year Ended December 31	**Amount**	**Percent**	**Amount**	**Percent**	**Amount**	**Percent**
2011	$(53,810,165)	(1.04)%	$164,671,046	3.03%	$149,447,325	3.15%
2012	698,682,557	13.91%	91,936,980	1.67%	76,720,113	1.59%
2013	1,095,188,215	19.53%	533,248,385	9.73%	410,409,663	8.48%
2014	266,028,241	4.04%	710,015,277	12.05%	548,585,891	10.61%
2015	(19,960,005)	(0.30)%	569,295,018	8.78%	489,086,474	8.68%
2016	454,641,033	6.91%	452,144,779	6.53%	436,958,056	7.24%
2017	1,293,322,206	18.77%	640,343,891	8.85%	495,891,253	7.77%
2018	(371,111,618)	(4.62)%	507,081,208	6.56%	508,199,399	7.50%
2019	1,342,794,799	17.86%	512,986,851	6.34%	455,280,174	6.33%
2020	1,001,415,117	11.50%	618,817,861	7.32%	490,338,431	6.50%
Most recent five-year average return		**9.74%**		**7.12%**		**7.07%**
Most recent ten-year average return		**8.32%**		**7.05%**		**6.76%**

Note: Each year's yield is weighted by the average asset value in that year.

[1] Net of administrative and investment expenses.

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

Market, Actuarial and Valuation Value Rates of Return for Years Ended December 31, 2007 – 2020



Contributions

Contributions for the year ended December 31, 2020 totaled $415.9 million, compared to the projected amount of $428.0 million. This resulted in a loss of $12.6 million for the year, when adjusted for timing.

Non-investment experience

Other experience

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

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

The net gain from this other experience for the year ended December 31, 2020 amounted to $35.1 million, which is 0.3% of the actuarial accrued liability. A majority of the gain was due to mortality experience for continuing retirees. See *Subsection E* for a detailed development of the unfunded actuarial accrued liability.

D. Other Changes in the Actuarial Accrued Liability

Actuarial assumptions

Based on the December 1, 2016 through November 30, 2019 Actuarial Experience Study report dated September 9, 2020, various actuarial assumptions were updated.

- The changes in actuarial assumptions increased the Actuarial Accrued Liability by $321.7 million (a 3.2% increase) and increased the total Normal Cost by $11.8 million (a 5.1% increase). The effect on the employer contribution rate was an increase of 2.44% of payroll.

Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan Provisions

There were no changes in plan provisions since the prior valuation.

A summary of plan provisions is in *Section 4, Exhibit II*.

E. Development of Unfunded Actuarial Accrued Liability

Development for Year Ended December 31, 2020
Total Plan

1	**Unfunded actuarial accrued liability at beginning of year**		**$2,195,042,000**
2	Total normal cost at middle of year		224,598,000
3	Expected employer and member contributions		(428,037,000)
4	Interest		152,541,000
5	Expected unfunded actuarial accrued liability		$2,144,144,000
6	Changes due to:		
	a) Investment return less than expected after "smoothing"[1]	$56,539,000	
	b) Actual contributions less than expected[2]	12,623,000	
	c) Individual salary increases lower than expected	(12,821,000)	
	d) Mortality higher than expected for continuing retirees	(25,448,000)	
	e) Other experience losses	3,162,000	
	f) Change in actuarial assumptions	321,740,000	
	Total changes		$355,795,000
7	**Unfunded actuarial accrued liability at end of year**		**$2,499,939,000**

Note: The sum of items 6c through 6e equals the "Net gain from other experience" shown in *Section 2, Subsection C.*

1 Due to recognition of market loss during the first 6-month period of 2020.
2 Includes impact of scheduled lag in rate implementation and difference between Normal Cost and UAAL contributions due to actual payroll different than expected during 2020.

E. Development of Unfunded Actuarial Accrued Liability (continued)

Development for Year Ended December 31, 2020
General (Excluding LARPD & Office of Education) Only

1	**Unfunded actuarial accrued liability at beginning of year**		**$1,319,290,000**
2	Total Normal cost at middle of year		164,152,000
3	Expected employer and member contributions		(286,536,000)
4	Interest		91,685,000
5	Expected unfunded actuarial accrued liability		$1,288,591,000
6	Changes due to:		
	a) Investment return less than expected after "smoothing"[1]	$42,162,000	
	b) Actual contributions less than expected[2]	10,583,000	
	c) Individual salary increases lower than expected	(9,051,000)	
	d) Mortality higher than expected for continuing retirees	(15,010,000)	
	e) Other experience losses	1,087,000	
	f) Change in actuarial assumptions	231,791,000	
	Total changes		$261,562,000
7	**Unfunded actuarial accrued liability at end of year**		**$1,550,153,000**

[1] Due to recognition of market loss during the first 6-month period of 2020.
[2] Includes impact of scheduled lag in rate implementation and difference between Normal Cost and UAAL contributions due to actual payroll different than expected during 2020.

E. Development of Unfunded Actuarial Accrued Liability (continued)

Development for Year Ended December 31, 2020
General (Office of Education) Only

1	**Unfunded actuarial accrued liability at beginning of year**		**$945,000**
2	Total Normal cost at middle of year		0
3	Expected employer and member contributions		(77,000)
4	Interest		63,000
5	Expected unfunded actuarial accrued liability		$931,000
6	Changes due to:		
	a) Investment return less than expected after "smoothing"[1]	$27,000	
	b) Actual contributions less than expected	7,000	
	c) Mortality lower than expected for continuing retirees	70,000	
	d) Other experience losses	2,000	
	e) Change in actuarial assumptions	18,000	
	Total changes		$124,000
7	**Unfunded actuarial accrued liability at end of year**		**$1,055,000**

[1] Due to recognition of market loss during the first 6-month period of 2020.

E. Development of Unfunded Actuarial Accrued Liability (continued)

Development for Year Ended December 31, 2020
General (LARPD) Only

1	**Unfunded actuarial accrued liability at beginning of year**		**$14,330,000**
2	Total Normal cost at middle of year		1,011,000
3	Expected employer and member contributions		(2,213,000)
4	Interest		1,000,000
5	Expected unfunded actuarial accrued liability		$14,128,000
6	Changes due to:		
	a) Investment return less than expected after "smoothing"[1]	$346,000	
	b) Actual contributions less than expected[2]	242,000	
	c) Individual salary increases lower than expected	(307,000)	
	d) Mortality higher than expected for continuing retirees	(2,725,000)	
	e) Other experience losses	420,000	
	f) Change in actuarial assumptions	1,171,000	
	Total changes		$(853,000)
7	**Unfunded actuarial accrued liability at end of year**		**$13,275,000**

[1] Due to recognition of market loss during the first 6-month period of 2020.

[2] Includes impact of scheduled lag in rate implementation and difference between Normal Cost and UAAL contributions due to actual payroll different than expected during 2020.

E. Development of Unfunded Actuarial Accrued Liability (continued)

Development for Year Ended December 31, 2020
Safety Only

1	**Unfunded actuarial accrued liability at beginning of year**		**$860,477,000**
2	Total Normal cost at middle of year		59,435,000
3	Expected employer and member contributions		(139,211,000)
4	Interest		59,793,000
5	Expected unfunded actuarial accrued liability		$840,494,000
6	Changes due to:		
	a) Investment return less than expected after "smoothing"[1]	$14,004,000	
	b) Actual contributions less than expected[2]	1,791,000	
	c) Individual salary increases lower than expected	(3,463,000)	
	d) Mortality higher than expected for continuing retirees	(7,783,000)	
	e) Other experience losses	1,653,000	
	f) Change in actuarial assumptions	88,760,000	
	Total changes		$94,962,000
7	**Unfunded actuarial accrued liability at end of year**		**$935,456,000**

[1] Due to recognition of market loss during the first 6-month period of 2020.
[2] Includes impact of scheduled lag in rate implementation and difference between Normal Cost and UAAL contributions due to actual payroll different than expected during 2020.

F. Recommended Contribution

The recommended contribution is equal to the employer Normal Cost payment and a payment on the Unfunded Actuarial Accrued Liability. As of December 31, 2020, the average recommended employer contribution is 31.28% of compensation.

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

The contribution requirement as of December 31, 2020 is based on the data previously described, the actuarial assumptions and Plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

Average Recommended Employer Contribution for Year Ended December 31

		2020		2019	
		Amount ($ in '000s)	**% of Projected Compensation**	**Amount ($ in '000s)**	**% of Projected Compensation**
1	Total normal cost	$240,762	20.83%	$224,598	19.89%
2	Expected member normal cost contributions	114,901	9.94%	105,456	9.34%
3	Employer normal cost: (1) - (2)	$125,861	10.89%	$119,142	10.55%
4	Actuarial accrued liability	10,484,180		9,795,019	
5	Valuation value of assets	7,984,241		7,599,977	
6	Unfunded actuarial accrued liability (UAAL): (4) - (5)	$2,499,939		$2,195,042	
7	Payment on UAAL	235,622	20.39%	203,362	18.01%
8	Projected compensation	1,155,697		1,129,175	
9	**Total average recommended employer contribution: (3) + (7)**	**$361,483**	**31.28%**	**$322,504**	**28.56%**

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

Reconciliation of Average Recommended Employer Contribution Rate

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

Reconciliation from December 31, 2019 to December 31, 2020
Total Plan

	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Recommended Employer Contribution as of December 31, 2019[2]	**28.47%**	**$328,976**
1 Effect of investment return less than expected after "smoothing"[3]	0.35%	4,045
2 Effect of actual contributions less than expected[4]	0.08%	925
3 Effect of individual salary increases lower than expected	(0.09)%	(1,040)
4 Effect of amortizing prior year's UAAL over a smaller than expected total projected payroll	0.24%	2,774
5 Effect of mortality higher than expected for continuing retirees	(0.16)%	(1,849)
6 Effect of changes in member demographics on Normal Cost	(0.05)%	(578)
7 Effect of other losses[5]	0.00%	31
8 Effect of change in assumptions	2.44%	28,199
Total change	2.81%	32,507
Average Recommended Employer Contribution as of December 31, 2020	**31.28%**	**$361,483**

1 Based on December 31, 2020 projected compensation.
2 Determined by applying the recommended employer contribution rates as of December 31, 2019 to the projected compensation as of December 31, 2020 by cost group, membership class and tier.
3 Due to recognition of market loss during the first 6-month period of 2020.
4 Includes impact of scheduled lag in rate implementation and difference between Normal Cost and UAAL contributions due to actual payroll during 2020 different than expected.
5 Other differences in actual versus expected experience including (but not limited to) retirement, disability and termination experience as well as COLA increases lower than expected for continuing retirees.

Reconciliation of Average Recommended Employer Contribution Rate (continued)

Reconciliation from December 31, 2019 to December 31, 2020
General (Excluding LARPD & Office of Education) Only

	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Recommended Employer Contribution as of December 31, 2019[2]	**22.06%**	**$214,414**
1 Effect of investment return less than expected after "smoothing"[3]	0.31%	3,013
2 Effect of actual contributions less than expected[4]	0.08%	778
3 Effect of individual salary increases lower than expected	(0.08)%	(778)
4 Effect of amortizing prior year's UAAL over a smaller than expected total projected payroll	0.12%	1,166
5 Effect of mortality higher than expected for continuing retirees	(0.11)%	(1,069)
6 Effect of changes in member demographics on Normal Cost	(0.02)%	(194)
7 Effect of other gains[5]	(0.01)%	(49)
8 Effect of change in assumptions	1.96%	19,051
Total change	2.25%	21,918
Average Recommended Employer Contribution as of December 31, 2020	**24.31%**	**$236,332**

1 Based on December 31, 2020 projected compensation.
2 Determined by applying the recommended employer contribution rates as of December 31, 2019 to the projected compensation as of December 31, 2020 by cost group, membership class and tier.
3 Due to recognition of market loss during the first 6-month period of 2020.
4 Includes impact of scheduled lag in rate implementation and difference between Normal Cost and UAAL contributions due to actual payroll during 2020 different than expected.
5 Other differences in actual versus expected experience including (but not limited to) retirement, disability and termination experience as well as COLA increases lower than expected for continuing retirees.

Reconciliation of Average Recommended Employer Contribution Rate (continued)

Reconciliation from December 31, 2019 to December 31, 2020
General (LARPD) Only

	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Recommended Employer Contribution as of December 31, 2019[2]	**40.26%**	**$1,487**
1 Effect of investment return less than expected after "smoothing"[3]	0.67%	25
2 Effect of actual contributions less than expected[4]	0.46%	17
3 Effect of individual salary increases lower than expected	(0.48)%	(18)
4 Effect of amortizing prior year's UAAL over a smaller than expected total projected payroll[5]	5.93%	219
5 Effect of mortality higher than expected for continuing retirees[6]	(5.26)%	(194)
6 Effect of changes in member demographics on Normal Cost	0.00%	0
7 Effect of other losses[7]	0.78%	29
8 Effect of change in assumptions	2.36%	87
Total change	4.46%	165
Average Recommended Employer Contribution as of December 31, 2020	**44.72%**	**$1,652**

1 Based on December 31, 2020 projected compensation.
2 Determined by applying the recommended employer contribution rates as of December 31, 2019 to the projected compensation as of December 31, 2020 by cost group, membership class and tier.
3 Due to recognition of market loss during the first 6-month period of 2020.
4 Includes impact of scheduled lag in rate implementation and difference between Normal Cost and UAAL contributions due to actual payroll during 2020 different than expected.
5 Eight active members in the December 31, 2019 valuation data were classified as either retired or vested terminated members in the December 31, 2020 valuation data. This reduction in the number of active members (from 51 active members in the December 31, 2019 valuation to 43 active members in the December 31, 2020 valuation) resulted in a reduction in projected compensation from $4,331,000 as of December 31, 2019 to $3,694,000 as of December 31, 2020 (versus an expected projected compensation of $4,483,000 for a reduction of about 18%).
6 There were 4 retiree deaths and 1 beneficiary death during 2020.
7 Other differences in actual versus expected experience including (but not limited to) retirement, disability and termination experience as well as COLA increases lower than expected for continuing retirees.

Reconciliation of Average Recommended Employer Contribution Rate (continued)

Reconciliation from December 31, 2019 to December 31, 2020
Safety Only

	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Recommended Employer Contribution as of December 31, 2019[2]	**62.82%**	**$113,075**
1 Effect of investment return less than expected after "smoothing"[3]	0.55%	990
2 Effect of actual contributions less than expected[4]	0.07%	126
3 Effect of individual salary increases lower than expected	(0.20)%	(360)
4 Effect of amortizing prior year's UAAL over a smaller than expected total projected payroll	0.79%	1,422
5 Effect of mortality higher than expected for continuing retirees	(0.31)%	(558)
6 Effect of changes in member demographics on Normal Cost	(0.20)%	(360)
7 Effect of other losses[5]	0.00%	2
8 Effect of change in assumptions	5.09%	9,162
Total change	5.79%	10,424
Average Recommended Employer Contribution as of December 31, 2020	**68.61%**	**$123,499**

1 Based on December 31, 2020 projected compensation.
2 Determined by applying the recommended employer contribution rates as of December 31, 2019 to the projected compensation as of December 31, 2020 by cost group, membership class and tier.
3 Due to recognition of market loss during the first 6-month period of 2020.
4 Includes impact of scheduled lag in rate implementation and difference between Normal Cost and UAAL contributions due to actual payroll during 2020 different than expected.
5 Other differences in actual versus expected experience including (but not limited to) retirement, disability and termination experience.

Reconciliation of Average Recommended Member Contribution Rate

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

Reconciliation from December 31, 2019 to December 31, 2020

	Contribution Rate	Estimated Annual Dollar Amount[1] ($ in '000s)
Average Recommended Member Contribution as of December 31, 2019	**9.35%**	**$108,061**
• Effect of changes in member demographics	0.00%	0
• Effect of change in assumptions	0.59%	6,840
Average Recommended Member Contribution as of December 31, 2020	**9.94%**	**$114,901**

By Membership and Tier

	General Tier 1	General Tier 2	General Tier 3	General Tier 4
Average Recommended Member Contribution as of December 31, 2019	**9.59%**	**7.65%**	**14.07%**	**8.85%**
• Effect of changes in member demographics	(0.05)%	0.00%	0.23%[2]	0.03%
• Effect of change in assumptions	0.32%	0.57%	0.70%	0.33%
Average Recommended Member Contribution as of December 31, 2020	**9.86%**	**8.22%**	**15.00%**	**9.21%**

	Safety Tier 1	Safety Tier 2	Safety Tier 2C	Safety Tier 2D	Safety Tier 4
Average Recommended Member Contribution as of December 31, 2019	**3.00%**	**15.89%**	**13.29%**	**16.02%**	**15.42%**
• Effect of changes in member demographics	0.00%	0.01%	0.12%	0.02%	(0.22)%
• Effect of change in assumptions	0.00%	1.05%	1.24%	1.13%	1.73%
Average Recommended Member Contribution as of December 31, 2020	**3.00%**	**16.95%**	**14.65%**	**17.17%**	**16.93%**

[1] Based on December 31, 2020 projected compensation.
[2] There is one General Tier 4 LARPD member in the December 31, 2019 valuation data who was reclassified as General Tier 3 in the December 31, 2020 valuation data with a higher entry age compared to the remaining General Tier 3 members. This results in an increase to the COLA member contribution rates.

Recommended Employer Contribution Rates[1]

County Only	December 31, 2020 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[2] ($ in '000s)	December 31, 2019 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[2] ($ in '000s)
General Tier 1 Members								
Normal Cost	8.17%	2.79%	10.96%	$680	7.57%	2.75%	10.32%	$640
UAAL (Before POB Credit)	15.54%	5.22%	20.76%	1,287	13.96%	4.69%	18.65%	1,156
Pension Obligation Bond Credit	-3.67%	-1.57%	-5.24%	-325	-3.64%	-1.56%	-5.20%	-322
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-58	-0.87%	0.00%	-0.87%	-54
Total Contributions	**19.10%**	**6.44%**	**25.54%**	**$1,584**	**17.02%**	**5.88%**	**22.90%**	**$1,420**
General Tier 2 Members								
Normal Cost	7.83%	1.64%	9.47%	$35,944	7.74%	1.60%	9.34%	$35,450
UAAL (Before POB Credit)	15.54%	5.22%	20.76%	78,795	13.96%	4.69%	18.65%	70,786
Pension Obligation Bond Credit	-3.67%	-1.57%	-5.24%	-19,889	-3.64%	-1.56%	-5.20%	-19,737
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-3,568	-0.87%	0.00%	-0.87%	-3,302
Total Contributions	**18.76%**	**5.29%**	**24.05%**	**$91,282**	**17.19%**	**4.73%**	**21.92%**	**$83,197**
General Tier 4 Members								
Normal Cost	7.47%	1.74%	9.21%	$22,655	7.22%	1.63%	8.85%	$21,770
UAAL (Before POB Credit)	15.54%	5.22%	20.76%	51,067	13.96%	4.69%	18.65%	45,877
Pension Obligation Bond Credit	-3.67%	-1.57%	-5.24%	-12,890	-3.64%	-1.56%	-5.20%	-12,791
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-2,312	-0.87%	0.00%	-0.87%	-2,140
Total Contributions	**18.40%**	**5.39%**	**23.79%**	**$58,520**	**16.67%**	**4.76%**	**21.43%**	**$52,716**

[1] For employers with active member payroll. The UAAL contribution for ACOE, expressed as a level dollar amount, is $100 K when made on April 1, 2022.

[2] Amounts are based on the December 31, 2020 projected compensation shown on page 48.

Recommended Employer Contribution Rates (continued)

County Only	December 31, 2020 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)	December 31, 2019 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)
Safety Tier 1 Members								
Normal Cost	29.74%	12.62%	42.36%	$208	29.04%	11.96%	41.00%	$201
Member Cost Sharing Contributions (Adjusted for Refunds)	-3.00%	0.00%	-3.00%	-15	-3.00%	0.00%	-3.00%	-15
UAAL (Before POB Credit)	41.99%	13.81%	55.80%	274	38.85%	12.28%	51.13%	251
Pension Obligation Bond Credit	-3.28%	-1.99%	-5.27%	-26	-3.21%	-1.98%	-5.19%	-25
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-5	-0.87%	0.00%	-0.87%	-4
Total Contributions	**64.51%**	**24.44%**	**88.95%**	**$436**	**60.81%**	**22.26%**	**83.07%**	**$408**
Safety Tier 2 Members								
Normal Cost	18.69%	3.84%	22.53%	$24,737	17.86%	3.67%	21.53%	$23,639
Member Cost Sharing Contributions (Adjusted for Refunds)	-2.97%	0.00%	-2.97%	-3,261	-2.94%	0.00%	-2.94%	-3,228
UAAL (Before POB Credit)	41.99%	13.81%	55.80%	61,265	38.85%	12.28%	51.13%	56,138
Pension Obligation Bond Credit	-3.28%	-1.99%	-5.27%	-5,786	-3.21%	-1.98%	-5.19%	-5,698
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-1,032	-0.87%	0.00%	-0.87%	-955
Total Contributions	**53.49%**	**15.66%**	**69.15%**	**$75,923**	**49.69%**	**13.97%**	**63.66%**	**$69,896**
Safety Tier 2C Members								
Normal Cost	20.02%	4.26%	24.28%	$701	16.31%	3.56%	19.87%	$574
Member Cost Sharing Contributions (Adjusted for Refunds)	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%	0
UAAL (Before POB Credit)	41.99%	13.81%	55.80%	1,611	38.85%	12.28%	51.13%	1,476
Pension Obligation Bond Credit	-3.28%	-1.99%	-5.27%	-152	-3.21%	-1.98%	-5.19%	-150
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-27	-0.87%	0.00%	-0.87%	-25
Total Contributions	**57.79%**	**16.08%**	**73.87%**	**$2,133**	**51.08%**	**13.86%**	**64.94%**	**$1,875**

[1] Amounts are based on the December 31, 2020 projected compensation shown on page 48.

Recommended Employer Contribution Rates (continued)

County Only	December 31, 2020 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)	December 31, 2019 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)
Safety Tier 2D Members								
Normal Cost	19.10%	4.07%	23.17%	$3,838	17.45%	3.70%	21.15%	$3,503
Member Cost Sharing Contributions (Adjusted for Refunds)	-2.93%	0.00%	-2.93%	-485	-2.91%	0.00%	-2.91%	-482
UAAL (Before POB Credit)	41.99%	13.81%	55.80%	9,242	38.85%	12.28%	51.13%	8,469
Pension Obligation Bond Credit	-3.28%	-1.99%	-5.27%	-873	-3.21%	-1.98%	-5.19%	-860
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-156	-0.87%	0.00%	-0.87%	-144
Total Contributions	**53.94%**	**15.89%**	**69.83%**	**$11,566**	**49.31%**	**14.00%**	**63.31%**	**$10,486**
Safety Tier 4 Members								
Normal Cost	13.19%	3.74%	16.93%	$8,511	12.16%	3.26%	15.42%	$7,752
Member Cost Sharing Contributions (Adjusted for Refunds)	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%	0
UAAL (Before POB Credit)	41.99%	13.81%	55.80%	28,052	38.85%	12.28%	51.13%	25,704
Pension Obligation Bond Credit	-3.28%	-1.99%	-5.27%	-2,649	-3.21%	-1.98%	-5.19%	-2,609
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-473	-0.87%	0.00%	-0.87%	-437
Total Contributions	**50.96%**	**15.56%**	**66.52%**	**$33,441**	**46.93%**	**13.56%**	**60.49%**	**$30,410**
All County Categories Combined								
Normal Cost	9.81%	2.17%	11.98%	$97,274	9.47%	2.05%	11.52%	$93,529
Member Cost Sharing Contributions (Adjusted for Refunds)	-0.46%	0.00%	-0.46%	-3,761	-0.46%	0.00%	-0.46%	-3,725
UAAL (Before POB Credit)	21.41%	7.12%	28.53%	231,593	19.48%	6.37%	25.85%	209,857
Pension Obligation Bond Credit	-3.58%	-1.67%	-5.25%	-42,590	-3.54%	-1.66%	-5.20%	-42,192
Implicit Retiree Health Benefit Subsidy	-0.94%	0.00%	-0.94%	-7,631	-0.87%	0.00%	-0.87%	-7,061
Total Contributions	**26.24%**	**7.62%**	**33.86%**	**$274,885**	**24.08%**	**6.76%**	**30.84%**	**$250,408**

[1] Amounts are based on the December 31, 2020 projected compensation shown on page 48.

Recommended Employer Contribution Rates (continued)

AHS, Court & First 5 Only	December 31, 2020 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)	December 31, 2019 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)
General Tier 1 Members								
Normal Cost	8.17%	2.79%	10.96%	$128	7.57%	2.75%	10.32%	$121
UAAL (Before POB Credit)	15.54%	5.22%	20.76%	243	13.96%	4.69%	18.65%	218
Pension Obligation Bond Credit	-3.67%	-1.57%	-5.24%	-61	-3.64%	-1.56%	-5.20%	-61
Total Contributions	**20.04%**	**6.44%**	**26.48%**	**$310**	**17.89%**	**5.88%**	**23.77%**	**$278**
General Tier 2 Members								
Normal Cost	7.83%	1.64%	9.47%	$17,000	7.74%	1.60%	9.34%	$16,767
UAAL (Before POB Credit)	15.54%	5.22%	20.76%	37,267	13.96%	4.69%	18.65%	33,480
Pension Obligation Bond Credit	-3.67%	-1.57%	-5.24%	-9,407	-3.64%	-1.56%	-5.20%	-9,335
Total Contributions	**19.70%**	**5.29%**	**24.99%**	**$44,860**	**18.06%**	**4.73%**	**22.79%**	**$40,912**
General Tier 4 Members								
Normal Cost	7.47%	1.74%	9.21%	$14,236	7.22%	1.63%	8.85%	$13,680
UAAL (Before POB Credit)	15.54%	5.22%	20.76%	32,089	13.96%	4.69%	18.65%	28,827
Pension Obligation Bond Credit	-3.67%	-1.57%	-5.24%	-8,100	-3.64%	-1.56%	-5.20%	-8,038
Total Contributions	**19.34%**	**5.39%**	**24.73%**	**$38,225**	**17.54%**	**4.76%**	**22.30%**	**$34,469**

[1] Amounts are based on the December 31, 2020 projected compensation shown on page 48.

Recommended Employer Contribution Rates (continued)

Housing Authority	December 31, 2020 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)	December 31, 2019 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)
General Tier 1 Members								
Normal Cost	8.17%	2.79%	10.96%	$335	7.57%	2.75%	10.32%	$316
UAAL	15.54%	5.22%	20.76%	635	13.96%	4.69%	18.65%	571
Total Contributions	**23.71%**	**8.01%**	**31.72%**	**$970**	**21.53%**	**7.44%**	**28.97%**	**$887**
General Tier 2 Members								
Normal Cost	7.83%	1.64%	9.47%	$23	7.74%	1.60%	9.34%	$23
UAAL	15.54%	5.22%	20.76%	51	13.96%	4.69%	18.65%	46
Total Contributions	**23.37%**	**6.86%**	**30.23%**	**$74**	**21.70%**	**6.29%**	**27.99%**	**$69**
General Tier 4 Members								
Normal Cost	7.47%	1.74%	9.21%	$156	7.22%	1.63%	8.85%	$150
UAAL	15.54%	5.22%	20.76%	351	13.96%	4.69%	18.65%	316
Total Contributions	**23.01%**	**6.96%**	**29.97%**	**$507**	**21.18%**	**6.32%**	**27.50%**	**$466**

[1] Amounts are based on the December 31, 2020 projected compensation shown on page 48.

Recommended Employer Contribution Rates (continued)

LARPD	December 31, 2020 Actuarial Valuation Basic	COLA	Total[1]	Estimated Annual Dollar Amount[2] ($ in '000s)	December 31, 2019 Actuarial Valuation Basic	COLA	Total[1]	Estimated Annual Dollar Amount[2] ($ in '000s)
General Tier 1 Members								
Normal Cost	8.17%	2.79%	10.96%	$59	7.57%	2.75%	10.32%	$55
UAAL	22.82%	9.18%	32.00%	172	18.63%	9.12%	27.75%	149
Total Contributions	**30.99%**	**11.97%**	**42.96%**	**$231**	**26.20%**	**11.87%**	**38.07%**	**$204**
General Tier 3 Members								
Normal Cost	12.07%	3.95%	16.02%	$284	11.82%	4.25%	16.07%	$285
UAAL	22.82%	9.18%	32.00%	567	18.63%	9.12%	27.75%	492
Total Contributions	**34.89%**	**13.13%**	**48.02%**	**$851**	**30.45%**	**13.37%**	**43.82%**	**$777**
General Tier 4 Members								
Normal Cost	7.47%	1.74%	9.21%	$127	7.22%	1.63%	8.85%	$122
UAAL	22.82%	9.18%	32.00%	443	18.63%	9.12%	27.75%	384
Total Contributions	**30.29%**	**10.92%**	**41.21%**	**$570**	**25.85%**	**10.75%**	**36.60%**	**$506**

[1] For LARPD, the combined rate is 44.72% as of December 31, 2020 and 40.26% as of December 31, 2019.

[2] Amounts are based on the December 31, 2020 projected compensation shown on page 48.

Recommended Employer Contribution Rates (continued)

All Categories Combined	December 31, 2020 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)	December 31, 2019 Actuarial Valuation Basic	COLA	Total	Estimated Annual Dollar Amount[1] ($ in '000s)
All Categories Combined								
Normal Cost (Net)	8.85%	2.04%	10.89%	$125,861	8.56%	1.94%	10.50%	$121,323
UAAL (Net)	15.44%	4.95%	20.39%	235,622	13.70%	4.27%	17.97%	207,653
Total Contributions	**24.29%**	**6.99%**	**31.28%**	**$361,483**	**22.26%**	**6.21%**	**28.47%**	**$328,976**

Payroll Breakdown ($ in '000s)

	County Only	AHS, Court, & First 5	Housing Authority	LARPD	Total
General Tier 1	$6,200	$1,170	$3,061	$537	$10,968
General Tier 2	379,552	179,515	248		559,315
General Tier 3				1,773	1,773
General Tier 4	245,987	154,571	1,692	1,384	403,634
Safety Tier 1	491				491
Safety Tier 2	109,794				109,794
Safety Tier 2C	2,887				2,887
Safety Tier 2D	16,563				16,563
Safety Tier 4	50,272				50,272
Total	**$811,746**	**$335,256**	**$5,001**	**$3,694**	**$1,155,697**

[1] Amounts are based on the December 31, 2020 projected compensation shown above.

Recommended Employer Contribution Rates (continued)

A breakdown of the approximate[1] portion of the employer contribution rate by the various types of benefit is as follows:

	General	Safety
Service and non-service connected disability benefits	7%	34%
Service retirement and other benefits	93%	66%
Total	**100%**	**100%**

[1] In developing these percentages, we made the simplifying assumption that the liability for active and inactive members (including members who have already retired) can be approximated by the proportion of the normal cost required to fund disability and non-disability benefits.

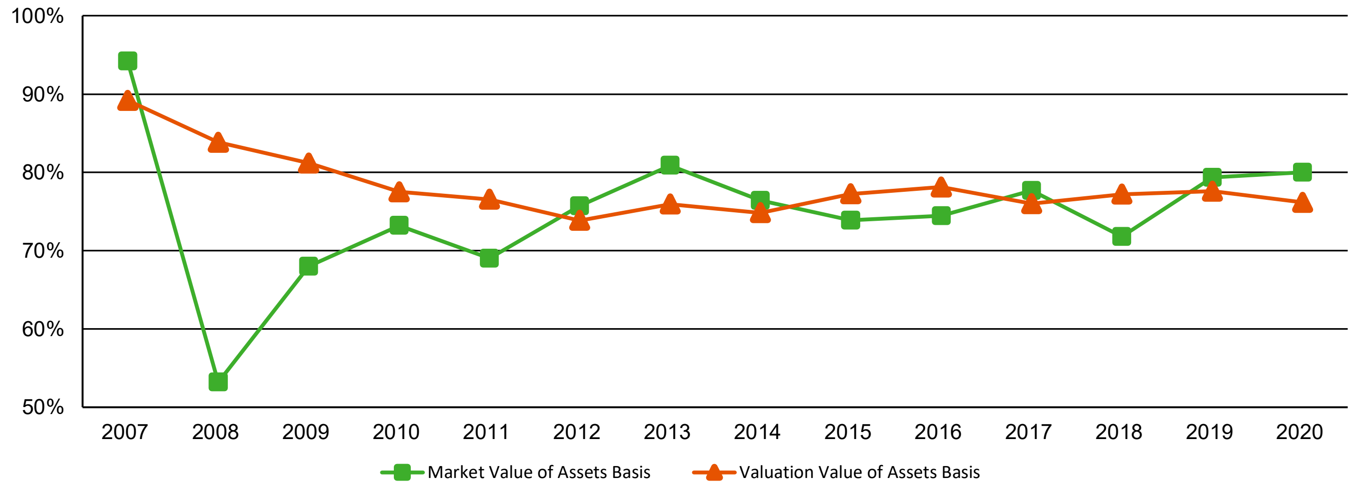
G. Funded Status

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

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

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

Funded Ratio for Years Ended December 31, 2007 – 2020[1]



[1] Prior to the December 31, 2013 valuation, the Funded Ratio on a Market Value basis was calculated using the end-of-year Valuation Value of Assets plus any deferred market gains. Beginning with the December 31, 2013 valuation, the Market Value of Assets for this purpose includes either one-half of any deferred market gains (after adjustment to include the balance in the Contingency Reserve) or a proportion of any deferred investment losses after netting out the Contingency Reserve that is commensurate with the size of the valuation reserves.

Schedule of Funding Progress for Years Ended December 31, 2011 – 2020

Actuarial Valuation Date as of December 31	Valuation Value of Assets[1] (a)	Actuarial Accrued Liability (AAL)[2] (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (%) (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (%) [(b) - (a)] / (c)
2011	$4,868,689,000	$6,359,483,000	$1,490,794,000	76.6%	$892,489,000	167.0%
2012	4,883,872,000	6,612,929,000	1,729,057,000	73.9%	906,500,000	190.7%
2013	5,210,944,000	6,861,687,000	1,650,743,000	75.9%	916,803,000	180.1%
2014	5,681,097,000	7,592,072,000	1,910,975,000	74.8%	948,848,000	201.4%
2015	6,083,536,000	7,875,020,000	1,791,484,000	77.3%	969,534,000	184.8%
2016	6,436,138,000	8,237,715,000	1,801,577,000	78.1%	1,003,651,000	179.5%
2017	6,830,379,000	8,987,061,000	2,156,682,000	76.0%	1,055,661,000	204.3%
2018	7,239,327,000	9,376,397,000	2,137,070,000	77.2%	1,093,735,000	195.4%
2019	7,599,977,000	9,795,019,000	2,195,042,000	77.6%	1,129,175,000	194.4%
2020	7,984,241,000	10,484,180,000	2,499,939,000	76.2%	1,155,697,000	216.3%

[1] Excludes assets for SRBR and other non-valuation reserves, and includes the following (whole dollar) reimbursement amounts of implicit retiree health benefit subsidy paid by the County (amounts beginning with the December 31, 2010 valuation date are estimates provided by ACERA):

Actuarial Valuation Date	Reimbursement Amount	For Year	Actuarial Valuation Date	Reimbursement Amount	For Year
12/31/2009	$5,287,767	2009	12/31/2015	$5,324,502	2015
12/31/2010	4,500,000	2010	12/31/2016	8,865,275	2016
12/31/2011	4,411,206	2011	12/31/2017	5,830,283	2017
12/31/2012	7,370,466	2012	12/31/2018	6,939,808	2018
12/31/2013	6,993,032	2013	12/31/2019	6,510,876	2019
12/31/2014	5,215,355	2014	12/31/2020	7,548,683	2020

[2] Excludes liabilities for SRBR and other non-valuation reserves.

H. Actuarial Balance Sheet

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

Second, this actuarial present value of future benefits is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer normal cost contributions, and the present value of future employer amortization payments for the unfunded actuarial accrued liability.

Actuarial Balance Sheet for Year Ended December 31, 2020

	Basic ($ in '000s)	COLA ($ in '000s)	Total ($ in '000s)
Actuarial present value of future benefits			
• Present value of benefits for retired members and beneficiaries	$4,027,398	$2,410,002	$6,437,400
• Present value of benefits for inactive vested members	247,159	45,947	293,106
• Present value of benefits for active members	4,490,926	1,082,372	5,573,298
Total actuarial present value of future benefits	**$8,765,483**	**$3,538,321**	**$12,303,804**
Current and future assets			
• Total valuation value of assets	$5,434,613	$2,549,628	$7,984,241
• Present value of future contributions by members	749,965	164,465	914,430
• Present value of future employer contributions for:			
• Entry age normal cost	720,830	184,364	905,194
• Unfunded actuarial accrued liability	1,860,075	639,864	2,499,939
Total of current and future assets	**$8,765,483**	**$3,538,321**	**$12,303,804**

I. Volatility Ratios

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

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

The current AVR is about 7.3. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 7.3% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.5% of payroll decrease/(increase) in the required contribution for each 1% asset gain or loss.

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

The LVR also indicates how volatile contributions will be in response to changes in the actuarial accrued liability due to actual experience or to changes in actuarial assumptions. The current LVR is about 9.1, but is 7.7 for General (non-LARPD) compared to 16.8 for General (LARPD) and 16.2 for Safety. This means that assumption changes will have a greater impact on employer contribution rates for General (LARPD) and Safety than for General (non-LARPD).

The increase in the AVR and LVR for LARPD this year was caused by about an 18% reduction in the payroll for LARPD (relative to the assumption) as reported in the December 31, 2020 valuation.

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

Volatility Ratios for Years Ended 2011 – 2020

	Asset Volatility Ratio[1,2]				Liability Volatility Ratio[2]			
Year Ended December 31	General (non-LARPD)	General (LARPD)	Safety	Total	General (non-LARPD)	General (LARPD)	Safety	Total
2011	4.5	4.2	7.0	4.9	6.2	6.8	11.9	7.1
2012	5.0	4.9	8.2	5.5	6.3	7.0	12.7	7.3
2013	5.5	5.7	9.1	6.1	6.4	7.4	13.1	7.5
2014	5.5	5.9	9.3	6.1	6.9	7.7	13.9	8.0
2015	5.5	5.7	8.8	6.0	7.0	7.3	13.7	8.1
2016	5.6	6.1	8.9	6.1	7.1	7.7	13.8	8.2
2017	6.0	7.6	9.8	6.6	7.3	9.1	14.6	8.5
2018	5.5	9.0	9.5	6.2	7.3	12.5	15.1	8.6
2019	6.1	11.1	10.8	6.9	7.4	14.1	15.4	8.7
2020	6.4	13.8	11.6	7.3	7.7	16.8	16.2	9.1

1 Prior to the December 31, 2013 valuation, the Asset Volatility Ratio was calculated using the end-of-year Valuation Value of Assets plus any deferred market gains. Beginning with the December 31, 2013 valuation, the adjusted Valuation Value of Assets for this purpose includes either one-half of any deferred market gains (after restoring the Contingency Reserve to 1% of total assets, if applicable) or a proportion of any deferred investment losses after netting out the Contingency Reserve that is commensurate with the size of the valuation reserves.

2 Prior to the December 31, 2018 valuation, volatility ratios for the General (non-LARPD) group were calculated including assets, liabilities, and payroll attributable to Tier 1 members from the Livermore Area Recreation and Park District (LARPD) and the Alameda County Office of Education (payroll was $0 as of December 31, 2017). Beginning with the December 31, 2018 valuation, the assets, liabilities, and payroll attributable to LARPD Tier 1 members are included in calculating the volatility ratios for the General (LARPD) group, and the assets and liabilities attributable to Office of Education Tier 1 members are excluded from this table.

J. Risk Assessment

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

This report does not contain a detailed analysis of the potential range of future measurements, but does include a concise discussion of some of the primary risks that may affect the Plan's future financial condition. We recommend a more detailed assessment of the risks to provide the Board with a better understanding of the risks inherent in the Plan that can inform both financial preparation and future decision making. This assessment would enable us to work with the Board to highlight and illustrate particular risks or potential future outcomes they may be interested in discussing and could include scenario testing, sensitivity testing, stress testing and stochastic modeling. As noted in the valuation highlights section of this report, a copy of the risk assessment report including the analysis recommended by Segal in consultation with ACERA staff will be available later in 2021.

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

Risk Assessments

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

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

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

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

  The investment return assumption is a long-term, static assumption for valuation purposes even though in reality market experience can be quite volatile in any given year. That volatility can cause significant changes in the financial condition of the Plan, affecting both funded status and contribution rates. The inherent year-to-year volatility is reduced by smoothing through the Actuarial Value of Assets, however investment experience can still have a sizable impact. As discussed in *Section 2,* *Subsection I, Volatility Ratios*, on page 53, a 1% asset gain or loss (relative to the assumed investment return) translates to about 7.3% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.5% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

The year-by-year market value rate of return over the last 10 years has ranged from a low of -4.62% to a high of 19.53%.

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

  The actuarial valuation includes current life expectancy assumptions and an expectation of future improvement in life expectancy, which are significant assumptions given the relatively long duration of liabilities for pension plans. Emerging plan experience that does not match these expectations will result in increases or decreases in the actuarially determined contribution over time. This risk can be reduced by using tables appropriate for the Plan (public experience tables) that are weighted by benefit levels, and by using generational mortality projections. Effective with this valuation, the Board has adopted benefit weighted mortality tables with the generational mortality projections.

- Other Risks

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

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

Evaluation of Historical Trends

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

- The funded percentage on the Valuation Value of Assets has fluctuated within a relatively narrow band from 73.9% to 78.1%. This is primarily due to contributions made to amortize the UAAL (i.e., amortizing each gain/loss layer of UAAL over 20 years) being roughly offset by lower than assumed average investment returns over recent years on a smoothed basis. For a more detailed history see *Section 2, Subsection G, Funded Status* starting on page 50.

- The geometric average investment return on the Actuarial Value of Assets over the last 10 years was 7.05%. (The comparable return for the Valuation Value of Assets was 6.76%.) This includes a high of 12.05% return and a low of 1.67%. The average over the last 5 years was 7.12%. For more details see the Investment Return table in *Section 2, Subsection C* on page 27.
- Beyond investment losses, the primary source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption changes in 2014 added $459 million in unfunded liability. The assumption changes in 2017 changed the discount rate from 7.60% to 7.25% (as well as various other changes) adding $396 million in unfunded liability. The assumption changes in this valuation (2020) changed the discount rate from 7.25% to 7.00% (as well as various other changes) adding $321.7 million in unfunded liability. For more details on unfunded liability changes see *Section 3, Exhibit H, Table of Amortization Bases* starting on page 83. A graphical representation of historical changes in UAAL by source will be included in the stand-alone risk assessment report.
- The plan's funding policy effectively deals with these unfunded liabilities over time. This can be seen most clearly in the *Section 3, Exhibit I, Projection of UAAL Balances and Payments* provided on pages 89 and 90.

Maturity Measures

In the last 10 years the ratio of members in pay status to active participants has increased from 0.74 to 0.91. An increased ratio indicates that the plan has grown in maturity over time. This is to be expected, but is also informative to understanding plan sensitivity to particular risks. For more details see *Section 2, Subsection A, Member Data* on page 18.

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities. For the prior year, benefits paid were $114 million more than contributions received. Plans with high levels of negative cash flows may have a need for a larger allocation to income generating assets, which can create a drag on investment return. However, the plan currently has a relatively low level of negative cash flow. For more details on historical cash flows see the Comparison of Contributions with Benefits in *Section 2, Subsection B* on page 22.

A further discussion of plan maturity measures and how they relate to changes in assets and liabilities is included in *Section 2, Subsection I, Volatility Ratios* starting on page 53.

Section 3: Supplemental Information

Exhibit A: Table of Plan Coverage

Total Plan

Category	Year Ended December 31: 2020	Year Ended December 31: 2019	Change From Prior Year
Active members in valuation:			
• Number	11,322	11,336	-0.1%
• Average age	47.1	47.1	0.0
• Average years of service	11.3	11.3	0.0
• Total projected compensation	$1,155,695,648	$1,129,176,948	2.3%
• Average projected compensation	$102,075	$99,610	2.5%
• Account balances	$1,296,260,411	$1,258,309,062	3.0%
• Total active vested members	7,645	7,699	-0.7%
Inactive vested members:			
• Number[1]	3,028	2,821	7.3%
• Average Age	47.4	47.3	0.1
Retired members:			
• Number in pay status	8,076	7,888	2.4%
• Average age	72.4	72.1	0.3
• Average monthly benefit[2]	$4,553	$4,425	2.9%
Disabled members:			
• Number in pay status	971	951	2.1%
• Average age	65.0	64.7	0.3
• Average monthly benefit[2]	$3,808	$3,672	3.7%
Beneficiaries:			
• Number in pay status	1,245	1,239	0.5%
• Average age	75.6	75.5	0.1
• Average monthly benefit[2]	$2,575	$2,448	5.2%

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the service retirees and disabled retirees was 60.2 and 49.8, respectively, for all the General and Safety Tiers combined.

[1] Includes inactive members due a refund of member contributions.
[2] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

General Tier 1

Category	Year Ended December 31 2020	Year Ended December 31 2019	Change From Prior Year
Active members in valuation:			
• Number	110	133	-17.3%
• Average age	60.9	60.6	0.3
• Average years of service	29.9	30.3	-0.4
• Total projected compensation	$10,968,006	$12,653,976	-13.3%
• Average projected compensation	$99,709	$95,143	4.8%
• Account balances	$48,155,989	$55,949,318	-13.9%
• Total active vested members	110	133	-17.3%
Inactive vested members:			
• Number[1]	39	43	-9.3%
• Average Age	64.2	62.7	1.5
Retired members:			
• Number in pay status	2,983	3,084	-3.3%
• Average age	77.2	76.8	0.4
• Average monthly benefit[2]	$5,355	$5,143	4.1%
Disabled members:			
• Number in pay status	136	143	-4.9%
• Average age	75.0	74.3	0.7
• Average monthly benefit[2]	$3,477	$3,348	3.9%
Beneficiaries:			
• Number in pay status	654	680	-3.8%
• Average age	80.5	80.3	0.2
• Average monthly benefit[2]	$2,653	$2,465	7.6%

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the General Tier 1 service and disabled retirees was 59.3 and 51.6, respectively.

[1] Includes inactive members due a refund of member contributions.
[2] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

General Tier 2

Category	Year Ended December 31 2020	Year Ended December 31 2019	Change From Prior Year
Active members in valuation:			
• Number	5,255	5,659	-7.1%
• Average age	52.5	52.1	0.4
• Average years of service	17.3	16.6	0.7
• Total projected compensation	$559,314,801	$585,265,989	-4.4%
• Average projected compensation	$106,435	$103,422	2.9%
• Account balances	$772,726,111	$774,077,768	-0.2%
• Total active vested members	5,143	5,528	-7.0%
Inactive vested members:			
• Number[1]	1,779	1,768	0.6%
• Average Age	50.9	50.3	0.6
Retired members:			
• Number in pay status	3,817	3,562	7.2%
• Average age	69.9	69.6	0.3
• Average monthly benefit[2]	$3,023	$2,855	5.9%
Disabled members:			
• Number in pay status	478	472	1.3%
• Average age	65.3	64.8	0.5
• Average monthly benefit[2]	$2,779	$2,681	3.7%
Beneficiaries:			
• Number in pay status	310	283	9.5%
• Average age	69.0	68.0	1.0
• Average monthly benefit[2]	$1,499	$1,447	3.6%

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the General Tier 2 service and disabled retirees was 62.5 and 50.7, respectively.

[1] Includes inactive members due a refund of member contributions.
[2] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

General Tier 3

Category	Year Ended December 31: 2020	Year Ended December 31: 2019	Change From Prior Year
Active members in valuation:			
• Number	19	20	-5.0%
• Average age	53.1	53.9	-0.8
• Average years of service	14.8	14.0	0.8
• Total projected compensation	$1,773,197	$1,811,498	-2.1%
• Average projected compensation	$93,326	$90,575	3.0%
• Account balances	$3,565,562	$3,421,771	4.2%
• Total active vested members	16	18	-11.1%
Inactive vested members:			
• Number[1]	15	13	15.4%
• Average Age	51.3	49.5	1.8
Retired members:			
• Number in pay status	28	30	-6.7%
• Average age	64.7	63.4	1.3
• Average monthly benefit[2]	$4,502	$4,429	1.6%
Disabled members:			
• Number in pay status	1	1	0.0%
• Average age	67.1	66.1	1.0
• Average monthly benefit[2]	$2,256	$2,191	3.0%
Beneficiaries:			
• Number in pay status	4	3	33.3%
• Average age	63.6	63.0	0.6
• Average monthly benefit[2]	$3,288	$3,493	-5.9%

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the General Tier 3 service and disabled retirees was 59.2 and 62.6, respectively.

[1] Includes inactive members due a refund of member contributions.
[2] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

General Tier 4

Category	Year Ended December 31: 2020	Year Ended December 31: 2019	Change From Prior Year
Active members in valuation:			
• Number	4,576	4,148	10.3%
• Average age	41.6	41.0	0.6
• Average years of service	3.6	3.1	0.5
• Total projected compensation	$403,633,536[1]	$352,439,734	14.5%
• Average projected compensation	$88,207	$84,966	3.8%
• Account balances	$118,663,311	$88,004,346	34.8%
• Total active vested members	1,285	895	43.6%
Inactive vested members:			
• Number[2]	998	820	21.7%
• Average Age	40.9	40.5	0.4
Retired members:			
• Number in pay status	32	21	52.4%
• Average age	66.3	67.1	-0.8
• Average monthly benefit[3]	$1,177	$1,178	-0.1%
Disabled members:			
• Number in pay status	2	2	0.0%
• Average age	62.3	61.3	1.0
• Average monthly benefit[3]	$2,057	$2,017	2.0%
Beneficiaries:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit[3]	N/A	N/A	N/A

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the General Tier 4 service and disabled retirees was 64.8 and 58.2, respectively.

[1] Projected compensation for 2021 has been limited. It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2021 is equal to $128,059. (For an employer that is not enrolled in Social Security, the maximum amount is 120% of $128,059, or $153,671). (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2021. (reference: Section 7522.10(d)).

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

[3] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

Safety Tier 1

Category	Year Ended December 31 2020	Year Ended December 31 2019	Change From Prior Year
Active members in valuation:			
• Number	2	3	-33.3%
• Average age	64.4	64.5	-0.1
• Average years of service	36.4	29.2	7.2
• Total projected compensation	$490,851	$761,481	-35.5%
• Average projected compensation	$245,426	$253,827	-3.3%
• Account balances	$2,543,899	$3,309,986	-23.1%
• Total active vested members	2	3	-33.3%
Inactive vested members:			
• Number[1]	6	6	0.0%
• Average Age	63.7	62.7	1.0
Retired members:			
• Number in pay status	592	605	-2.1%
• Average age	73.9	73.0	0.9
• Average monthly benefit[2]	$8,814	$8,546	3.1%
Disabled members:			
• Number in pay status	92	94	-2.1%
• Average age	71.2	70.4	0.8
• Average monthly benefit[2]	$6,065	$5,874	3.3%
Beneficiaries:			
• Number in pay status	193	196	-1.5%
• Average age	76.0	75.4	0.6
• Average monthly benefit[2]	$3,891	$3,743	4.0%

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the Safety Tier 1 service and disabled retirees was 54.9 and 48.3, respectively.

[1] Includes inactive members due a refund of member contributions.
[2] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

Safety Tier 2

Category	Year Ended December 31 2020	Year Ended December 31 2019	Change From Prior Year
Active members in valuation:			
• Number	780	844	-7.6%
• Average age	47.7	47.1	0.6
• Average years of service	17.9	17.1	0.8
• Total projected compensation	$109,793,942	$114,928,537	-4.5%
• Average projected compensation	$140,761	$136,171	3.4%
• Account balances	$301,086,774	$293,552,702	2.6%
• Total active vested members	780	844	-7.6%
Inactive vested members:			
• Number[1]	125	122	2.5%
• Average Age	47.3	47.2	0.1
Retired members:			
• Number in pay status	613	579	5.9%
• Average age	63.4	63.0	0.4
• Average monthly benefit[2]	$6,293	$6,107	3.0%
Disabled members:			
• Number in pay status	253	233	8.6%
• Average age	57.3	56.7	0.6
• Average monthly benefit[2]	$5,114	$4,996	2.4%
Beneficiaries:			
• Number in pay status	84	77	9.1%
• Average age	61.3	61.7	-0.4
• Average monthly benefit[2]	$2,880	$2,634	9.3%

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the Safety Tier 2 service and disabled retirees was 55.6 and 47.5, respectively.

[1] Includes inactive members due a refund of member contributions.
[2] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

Safety Tier 2C

Category	Year Ended December 31 2020	Year Ended December 31 2019	Change From Prior Year
Active members in valuation:			
• Number	23	25	-8.0%
• Average age	45.6	44.0	1.6
• Average years of service	9.1	9.1	0.0
• Total projected compensation	$2,887,070	$3,115,284	-7.3%
• Average projected compensation	$125,525	$124,611	0.7%
• Account balances	$2,857,209	$2,926,564	-2.4%
• Total active vested members	20	24	-16.7%
Inactive vested members:			
• Number[1]	12	10	20.0%
• Average Age	44.9	45.0	-0.1
Retired members:			
• Number in pay status	3	1	200.0%
• Average age	51.5	52.5	-1.0
• Average monthly benefit[2]	$1,502	$858	75.1%
Disabled members:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit[2]	N/A	N/A	N/A
Beneficiaries:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit[2]	N/A	N/A	N/A

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the Safety Tier 2C service retirees was 50.1.

[1] Includes inactive members due a refund of member contributions.
[2] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

Safety Tier 2D

Category	Year Ended December 31 2020	Year Ended December 31 2019	Change From Prior Year
Active members in valuation:			
• Number	126	125	0.8%
• Average age	41.7	41.1	0.6
• Average years of service	9.6	8.9	0.7
• Total projected compensation	$16,562,719	$15,666,177	5.7%
• Average projected compensation	$131,450	$125,329	4.9%
• Account balances	$19,056,581	$16,239,989	17.3%
• Total active vested members	108	110	-1.8%
Inactive vested members:			
• Number[1]	15	12	25.0%
• Average Age	44.1	41.3	2.8
Retired members:			
• Number in pay status	2	1	100.0%
• Average age	58.2	53.7	4.5
• Average monthly benefit[2]	$2,298	$616	273.1%
Disabled members:			
• Number in pay status	6	6	0.0%
• Average age	50.6	49.6	1.0
• Average monthly benefit[2]	$4,063	$4,254	-4.5%
Beneficiaries:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit[2]	N/A	N/A	N/A

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the Safety Tier 2D service and disabled retirees was 56.4 and 47.9, respectively.

[1] Includes inactive members due a refund of member contributions.
[2] Excludes supplemental benefits paid from SRBR.

Exhibit A: Table of Plan Coverage (continued)

Safety Tier 4

Category	Year Ended December 31 2020	Year Ended December 31 2019	Change From Prior Year
Active members in valuation:			
• Number	431	379	13.7%
• Average age	36.1	36.1	0.0
• Average years of service	4.1	3.8	0.3
• Total projected compensation	$50,271,524[1]	$42,534,273	18.2%
• Average projected compensation	$116,639	$112,228	3.9%
• Account balances	$27,604,976	$20,826,619	32.5%
• Total active vested members	181	144	25.7%
Inactive vested members:			
• Number[2]	39	27	44.4%
• Average Age	34.3	34.1	0.2
Retired members:			
• Number in pay status	6	5	20.0%
• Average age	60.7	59.9	0.8
• Average monthly benefit[3]	$1,458	$1,437	1.5%
Disabled members:			
• Number in pay status	3	0	N/A
• Average age	51.4	N/A	N/A
• Average monthly benefit[3]	$4,741	N/A	N/A
Beneficiaries:			
• Number in pay status	0	0	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit[3]	N/A	N/A	N/A

Notes: Based on the data provided for the December 31, 2020 actuarial valuation, the average age at retirement for the Safety Tier 4 service and disabled retirees was 58.9 and 50.1, respectively.

[1] Projected compensation for 2021 has been limited. It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2021 is equal to $128,059. (For an employer that is not enrolled in Social Security, the maximum amount is 120% of $128,059, or $153,671). (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2021. (reference: Section 7522.10(d)).

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

[3] Excludes supplemental benefits paid from SRBR.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation

Total Plan

		Years of Service								
Age	**Total**	**0 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 – 39**	**40 & over**
Under 25	88	87	1	- -	- -	- -	- -	- -	- -	- -
	$76,168	$76,215	$72,073	- -	- -	- -	- -	- -	- -	- -
25 – 29	595	539	56	- -	- -	- -	- -	- -	- -	- -
	82,247	81,157	92,744	- -	- -	- -	- -	- -	- -	- -
30 – 34	1,209	815	362	32	- -	- -	- -	- -	- -	- -
	91,460	88,357	98,057	$95,844	- -	- -	- -	- -	- -	- -
35 – 39	1,497	636	479	335	46	1	- -	- -	- -	- -
	99,424	91,349	101,764	109,586	$113,036	$83,200	- -	- -	- -	- -
40 – 44	1,570	490	398	387	231	64	- -	- -	- -	- -
	104,693	92,942	101,604	112,673	116,652	122,449	- -	- -	- -	- -
45 – 49	1,651	383	291	339	336	266	35	1	- -	- -
	108,283	91,310	106,369	112,958	112,905	121,090	$122,970	$106,438	- -	- -
50 – 54	1,617	308	244	259	323	307	131	45	- -	- -
	108,920	101,271	103,165	108,173	110,329	116,790	121,176	97,282	- -	- -
55 – 59	1,456	216	189	229	255	207	155	172	30	3
	105,191	95,797	109,235	106,292	100,623	107,668	110,342	110,610	$103,890	$96,511
60 – 64	1,113	151	159	174	205	160	98	121	35	10
	102,945	95,910	106,761	102,041	100,266	103,705	104,589	104,764	117,189	118,956
65 – 69	401	53	66	80	66	48	32	32	15	9
	103,350	95,804	109,229	94,902	90,960	103,476	112,193	111,675	158,257	117,394
70 & over	125	14	11	24	24	17	10	13	5	7
	97,595	81,710	100,980	93,842	94,480	103,963	106,236	76,061	81,543	171,237
Total	**11,322**	**3,692**	**2,256**	**1,859**	**1,486**	**1,070**	**461**	**384**	**85**	**29**
	$102,075	**$90,353**	**$102,842**	**$108,463**	**$107,808**	**$113,644**	**$113,196**	**$106,114**	**$117,646**	**$128,769**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

General Tier 1

		Years of Service								
Age	**Total**	**0 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 – 39**	**40 & over**
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 – 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 – 34	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35 – 39	3	- -	- -	3	- -	- -	- -	- -	- -	- -
	$70,714	- -	- -	$70,714	- -	- -	- -	- -	- -	- -
40 – 44	4	- -	- -	3	1	- -	- -	- -	- -	- -
	94,116	- -	- -	75,396	$150,274	- -	- -	- -	- -	- -
45 – 49	6	- -	1	4	1	- -	- -	- -	- -	- -
	78,127	- -	$72,124	84,756	57,612	- -	- -	- -	- -	- -
50 – 54	7	- -	- -	- -	7	- -	- -	- -	- -	- -
	92,546	- -	- -	- -	92,546	- -	- -	- -	- -	- -
55 – 59	22	- -	- -	2	4	3	1	2	7	3
	85,195	- -	- -	76,123	78,696	$72,651	$92,128	$71,480	$94,956	$96,511
60 – 64	35	- -	3	1	2	2	3	5	10	9
	103,349	- -	108,309	58,313	194,308	144,505	64,957	100,200	103,513	91,706
65 – 69	24	- -	- -	1	1	2	3	4	4	9
	101,443	- -	- -	69,697	105,201	71,445	85,579	82,845	118,043	117,394
70 & over	9	- -	- -	- -	- -	- -	- -	- -	2	7
	148,520	- -	- -	- -	- -	- -	- -	- -	69,008	171,237
Total	**110**	**- -**	**4**	**14**	**16**	**7**	**7**	**11**	**23**	**28**
	$99,709	**- -**	**$99,263**	**$75,544**	**$104,019**	**$92,836**	**$77,677**	**$88,667**	**$100,435**	**$120,361**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

General Tier 2

		Years of Service								
Age	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 – 29	4	1	3	- -	- -	- -	- -	- -	- -	- -
	$60,056	$51,265	$62,987	- -	- -	- -	- -	- -	- -	- -
30 – 34	100	8	72	20	- -	- -	- -	- -	- -	- -
	90,929	94,111	96,431	$69,849	- -	- -	- -	- -	- -	- -
35 – 39	412	21	140	227	23	1	- -	- -	- -	- -
	104,079	130,456	109,599	100,724	$80,401	$83,200	- -	- -	- -	- -
40 – 44	682	21	158	301	163	39	- -	- -	- -	- -
	107,546	133,556	111,599	108,670	103,035	87,291	- -	- -	- -	- -
45 – 49	848	16	113	272	257	165	24	1	- -	- -
	109,266	128,775	118,849	109,769	106,470	106,265	$96,140	$106,438	- -	- -
50 – 54	1,004	17	106	223	266	237	112	43	- -	- -
	109,204	163,627	114,360	105,406	106,627	110,501	111,996	96,199	- -	- -
55 – 59	1,029	14	71	202	226	181	147	165	23	- -
	106,508	115,078	122,116	105,299	98,258	105,801	108,882	110,493	$106,609	- -
60 – 64	811	10	67	155	197	148	94	115	25	- -
	104,087	126,085	120,989	99,860	98,563	101,845	105,554	105,133	122,660	- -
65 – 69	275	4	28	72	65	42	28	27	9	- -
	105,843	105,287	126,392	94,351	90,741	104,388	115,860	115,391	190,135	- -
70 & over	90	- -	4	22	23	15	10	13	3	- -
	92,647	- -	103,050	94,495	91,626	94,590	106,236	76,061	89,899	- -
Total	**5,255**	**112**	**762**	**1,494**	**1,220**	**828**	**415**	**364**	**60**	**- -**
	$106,435	**$129,317**	**$113,371**	**$104,387**	**$101,638**	**$105,358**	**$108,639**	**$106,234**	**$124,990**	**- -**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

General Tier 3

		Years of Service								
Age	**Total**	**0 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 – 39**	**40 & over**
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 – 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 – 34	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35 – 39	2	2	- -	- -	- -	- -	- -	- -	- -	- -
	$114,338	$114,338	- -	- -	- -	- -	- -	- -	- -	- -
40 – 44	2	1	- -	- -	- -	1	- -	- -	- -	- -
	89,144	109,810	- -	- -	- -	$68,478	- -	- -	- -	- -
45 – 49	2	- -	1	- -	- -	1	- -	- -	- -	- -
	83,250	- -	$75,612	- -	- -	90,887	- -	- -	- -	- -
50 – 54	4	- -	1	1	1	1	- -	- -	- -	- -
	82,696	- -	75,975	$105,177	$75,177	74,454	- -	- -	- -	- -
55 – 59	5	- -	1	2	2	- -	- -	- -	- -	- -
	88,559	- -	115,193	86,475	77,326	- -	- -	- -	- -	- -
60 – 64	3	- -	- -	1	1	1	- -	- -	- -	- -
	112,068	- -	- -	150,095	74,454	111,655	- -	- -	- -	- -
65 – 69	1	- -	- -	- -	- -	- -	- -	- -	1	- -
	89,952	- -	- -	- -	- -	- -	- -	- -	$89,952	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**19**	**3**	**3**	**4**	**4**	**4**	**- -**	**- -**	**1**	**- -**
	$93,326	**$112,828**	**$88,927**	**$107,056**	**$76,071**	**$86,369**	**- -**	**- -**	**$89,952**	**- -**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

General Tier 4

		Years of Service								
Age	**Total**	**0 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 – 39**	**40 & over**
Under 25	66	65	1	- -	- -	- -	- -	- -	- -	- -
	$68,765	$68,714	$72,073	- -	- -	- -	- -	- -	- -	- -
25 – 29	497	462	35	- -	- -	- -	- -	- -	- -	- -
	77,822	77,877	77,104	- -	- -	- -	- -	- -	- -	- -
30 – 34	946	739	206	1	- -	- -	- -	- -	- -	- -
	87,095	86,796	87,969	$128,059	- -	- -	- -	- -	- -	- -
35 – 39	843	573	266	4	- -	- -	- -	- -	- -	- -
	89,248	88,308	91,402	80,600	- -	- -	- -	- -	- -	- -
40 – 44	662	451	206	3	2	- -	- -	- -	- -	- -
	89,748	89,792	90,068	67,186	$80,648	- -	- -	- -	- -	- -
45 – 49	519	356	155	7	1	- -	- -	- -	- -	- -
	90,022	88,430	93,771	88,068	89,492	- -	- -	- -	- -	- -
50 – 54	402	267	128	6	1	- -	- -	- -	- -	- -
	93,304	93,377	92,395	103,660	128,059	- -	- -	- -	- -	- -
55 – 59	298	192	95	8	2	- -	- -	1	- -	- -
	91,889	91,425	91,787	100,114	90,306	- -	- -	$128,059	- -	- -
60 – 64	228	138	80	9	1	- -	- -	- -	- -	- -
	92,354	92,913	90,286	98,201	128,059	- -	- -	- -	- -	- -
65 – 69	92	49	38	4	- -	1	- -	- -	- -	- -
	94,466	95,030	96,583	70,988	- -	$80,266	- -	- -	- -	- -
70 & over	23	14	7	2	- -	- -	- -	- -	- -	- -
	87,645	81,710	99,797	86,657	- -	- -	- -	- -	- -	- -
Total	**4,576**	**3,306**	**1,217**	**44**	**7**	**1**	**- -**	**1**	**- -**	**- -**
	$88,207	**$87,197**	**$90,741**	**$91,646**	**$98,217**	**$80,266**	**- -**	**$128,059**	**- -**	**- -**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

Safety Tier 1

		Years of Service								
Age	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 – 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 – 34	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35 – 39	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
40 – 44	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
45 – 49	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
50 – 54	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
55 – 59	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
60 – 64	1	- -	- -	- -	- -	- -	- -	- -	- -	1
	$364,202	- -	- -	- -	- -	- -	- -	- -	- -	$364,202
65 – 69	1	- -	- -	- -	- -	- -	- -	1	- -	- -
	126,649	- -	- -	- -	- -	- -	- -	$126,649	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**2**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**1**	**- -**	**1**
	$245,426	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**$126,649**	**- -**	**$364,202**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

Safety Tier 2

		Years of Service								
Age	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 – 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 – 34	7	- -	- -	7	- -	- -	- -	- -	- -	- -
	$140,738	- -	- -	$140,738	- -	- -	- -	- -	- -	- -
35 – 39	108	- -	- -	88	20	- -	- -	- -	- -	- -
	136,757	- -	- -	133,663	$150,369	- -	- -	- -	- -	- -
40 – 44	161	- -	1	75	62	23	- -	- -	- -	- -
	147,466	- -	$118,348	132,313	152,836	$183,671	- -	- -	- -	- -
45 – 49	235	- -	2	52	71	99	11	- -	- -	- -
	142,101	- -	108,941	133,654	137,554	146,091	$181,507	- -	- -	- -
50 – 54	165	- -	1	27	48	69	18	2	- -	- -
	140,269	- -	86,061	132,350	133,802	139,005	179,441	$120,573	- -	- -
55 – 59	71	- -	3	14	21	23	6	4	- -	- -
	131,277	- -	118,401	132,144	133,452	126,922	145,198	130,641	- -	- -
60 – 64	22	- -	- -	7	4	9	1	1	- -	- -
	133,399	- -	- -	150,194	136,604	124,349	132,754	85,116	- -	- -
65 – 69	8	- -	- -	3	- -	3	1	- -	1	- -
	124,322	- -	- -	148,433	- -	119,805	89,356	- -	$100,511	- -
70 & over	3	- -	- -	- -	1	2	- -	- -	- -	- -
	169,544	- -	- -	- -	160,111	174,261	- -	- -	- -	- -
Total	**780**	**- -**	**7**	**273**	**227**	**228**	**37**	**7**	**1**	**- -**
	$140,761	**- -**	**$111,071**	**$133,850**	**$141,767**	**$144,847**	**$170,806**	**$121,261**	**$100,511**	**- -**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

Safety Tier 2C

		Years of Service								
Age	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 – 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 – 34	3	- -	2	1	- -	- -	- -	- -	- -	- -
	$120,287	- -	$114,675	$131,509	- -	- -	- -	- -	- -	- -
35 – 39	5	- -	3	1	1	- -	- -	- -	- -	- -
	117,126	- -	124,615	126,671	$85,116	- -	- -	- -	- -	- -
40 – 44	5	- -	4	1	- -	- -	- -	- -	- -	- -
	121,434	- -	130,513	85,115	- -	- -	- -	- -	- -	- -
45 – 49	2	- -	2	- -	- -	- -	- -	- -	- -	- -
	120,317	- -	120,317	- -	- -	- -	- -	- -	- -	- -
50 – 54	3	2	- -	- -	- -	- -	1	- -	- -	- -
	110,800	$115,915	- -	- -	- -	- -	$100,571	- -	- -	- -
55 – 59	2	- -	2	- -	- -	- -	- -	- -	- -	- -
	167,789	- -	167,789	- -	- -	- -	- -	- -	- -	- -
60 – 64	3	1	2	- -	- -	- -	- -	- -	- -	- -
	141,599	92,332	166,233	- -	- -	- -	- -	- -	- -	- -
65 – 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**23**	**3**	**15**	**3**	**1**	**- -**	**1**	**- -**	**- -**	**- -**
	$125,525	**$108,054**	**$135,595**	**$114,432**	**$85,116**	**- -**	**$100,571**	**- -**	**- -**	**- -**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

Safety Tier 2D

		Years of Service								
Age	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 – 29	1	- -	1	- -	- -	- -	- -	- -	- -	- -
	$133,044	- -	$133,044	- -	- -	- -	- -	- -	- -	- -
30 – 34	22	1	18	3	- -	- -	- -	- -	- -	- -
	132,031	$137,294	130,117	$141,760	- -	- -	- -	- -	- -	- -
35 – 39	38	4	20	12	2	- -	- -	- -	- -	- -
	128,830	140,861	132,546	118,604	$128,965	- -	- -	- -	- -	- -
40 – 44	25	6	11	4	3	1	- -	- -	- -	- -
	131,904	153,067	128,801	114,619	121,486	$139,447	- -	- -	- -	- -
45 – 49	25	3	11	4	6	1	- -	- -	- -	- -
	134,213	150,109	144,802	132,516	109,975	122,249	- -	- -	- -	- -
50 – 54	6	2	2	2	- -	- -	- -	- -	- -	- -
	119,570	108,588	144,799	105,323	- -	- -	- -	- -	- -	- -
55 – 59	6	2	2	1	- -	- -	1	- -	- -	- -
	135,313	158,999	132,737	94,474	- -	- -	$133,933	- -	- -	- -
60 – 64	3	- -	2	1	- -	- -	- -	- -	- -	- -
	149,077	- -	156,978	133,276	- -	- -	- -	- -	- -	- -
65 – 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**126**	**18**	**67**	**27**	**11**	**2**	**1**	**- -**	**- -**	**- -**
	$131,450	**$144,702**	**$134,399**	**$121,314**	**$116,567**	**$130,848**	**$133,933**	**- -**	**- -**	**- -**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit B: Members in Active Service as of December 31, 2020 by Age, Years of Service, and Average Projected Compensation (continued)

Safety Tier 4

		Years of Service								
Age	**Total**	**0 – 4**	**5 – 9**	**10 – 14**	**15 – 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 – 39**	**40 & over**
Under 25	22	22	- -	- -	- -	- -	- -	- -	- -	- -
	$98,377	$98,377	- -	- -	- -	- -	- -	- -	- -	- -
25 – 29	93	76	17	- -	- -	- -	- -	- -	- -	- -
	106,302	101,488	$127,826	- -	- -	- -	- -	- -	- -	- -
30 – 34	131	67	64	- -	- -	- -	- -	- -	- -	- -
	113,275	104,159	122,819	- -	- -	- -	- -	- -	- -	- -
35 – 39	86	36	50	- -	- -	- -	- -	- -	- -	- -
	116,618	110,154	121,272	- -	- -	- -	- -	- -	- -	- -
40 – 44	29	11	18	- -	- -	- -	- -	- -	- -	- -
	117,464	110,193	121,907	- -	- -	- -	- -	- -	- -	- -
45 – 49	14	8	6	- -	- -	- -	- -	- -	- -	- -
	126,442	122,523	131,667	- -	- -	- -	- -	- -	- -	- -
50 – 54	26	20	6	- -	- -	- -	- -	- -	- -	- -
	146,194	151,455	128,659	- -	- -	- -	- -	- -	- -	- -
55 – 59	23	8	15	- -	- -	- -	- -	- -	- -	- -
	147,541	151,195	145,592	- -	- -	- -	- -	- -	- -	- -
60 – 64	7	2	5	- -	- -	- -	- -	- -	- -	- -
	140,257	153,671	134,891	- -	- -	- -	- -	- -	- -	- -
65 – 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**431**	**250**	**181**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$116,639	**$110,239**	**$125,479**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

Notes: Age and years of service were projected from November 30, 2020 to December 31, 2020.

Exhibit C: Reconciliation of Member Data

	Active Members	Inactive Vested Members[1]	Retired Members	Disabled Members	Beneficiaries	Total
Number as of December 31, 2019	**11,336**	**2,821**	**7,888**	**951**	**1,239**	**24,235**
• New members	805	0	0	0	81	886
• Terminations – with vested rights	(345)	345	0	0	0	0
• Contribution refunds	(94)	(85)	0	0	0	(179)
• Retirements	(366)	(68)	434	0	0	0
• New disabilities	(20)	(2)	(24)	46	0	0
• Return to work	29	(29)	0	0	0	0
• Died with or without beneficiary	(22)	(7)	(224)	(27)	(72)	(352)
• Data adjustments[2]	(1)	53	2	1	(3)	52
Number as of December 31, 2020	**11,322**	**3,028**	**8,076**	**971**	**1,245**	**24,642**

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

[2] Out of the net 53 data adjustments for inactive vested members: 41 members were hired and terminated employment after November 30, 2019 (i.e. the census data collection date for last year's valuation); 1 member was classified as contribution refunds in the December 31, 2019 valuation data and terminated vested in the December 31, 2020 data; and 1 member and 10 non-member records were added to the terminated vested file.

Exhibit D: Summary Statement of Income and Expenses on a Market Value Basis

		Year Ended December 31, 2020		Year Ended December 31, 2019
Net assets at market value at the beginning of the year		**$8,789,266,993[1]**		**$7,592,586,569**
Contribution income:				
• Employer contributions	$309,752,998		$298,526,950	
• Member contributions	106,104,226		103,117,022	
Net contribution income		*$415,857,224*		*$401,643,972*
Investment income:				
• Interest, dividends and other income	$77,950,984		$101,531,349	
• Asset appreciation	989,948,648		1,307,646,904	
• Less investment and administrative fees	(66,472,457)		(66,383,453)	
Net investment income		*$1,001,427,176*		*$1,342,794,800*
Total income available for benefits		**$1,417,284,399**		**$1,744,438,772**
Less benefit payments:				
• Service retirement	$(517,161,770)		$(489,452,611)	
• Death payments	(3,300,726)		(2,825,577)	
• Supplemental cost of living	(1,116,523)		(1,181,244)	
• Member refunds	(9,184,318)		(10,724,708)	
• Health insurance subsidies	(46,020,705)		(43,562,150)	
Net benefit payments		*$(576,784,042)*		*$(547,746,289)*
Change in net assets at market value		**$840,500,357**		**$1,196,692,483**
Net assets at market value at the end of the year		**$9,629,767,350**		**$8,789,279,051**

Note: Results may be slightly off due to rounding.

[1] As shown in the Statement of Changes in Fiduciary Net Position provided by ACERA for the twelve months ending December 31, 2020, the Net Position Held in Trust for Benefits as of January 1, 2020 ($8,789,266,992.99) differs from the Net Position as of December 31, 2019 ($8,789,279,051.49). Except where shown here, the Net Position as of January 1, 2020 is not used in this valuation.

Exhibit E: Summary Statement of Plan Assets

	December 31, 2020		December 31, 2019	
Cash		*$3,236,571*		*$4,151,369*
Securities lending collateral		*117,170,544*		*121,705,062*
Accounts receivable:				
• Contributions	$21,756,333		$18,310,516	
• Investment receivables	17,178,702		17,044,483	
• Investments sold	96,399,659		3,361,020	
• Futures contracts	236,299		307,397	
• Foreign exchange contracts	5,852,639		5,129,347	
• Others	196,974		290,431	
Total accounts receivable		*$141,620,606*		*$44,443,194*
Prepaid expenses		*755,153*		*762,811*
Investments:				
• Short-term investments	$182,037,100		$231,758,980	
• Equities	5,478,883,008		4,852,057,801	
• Fixed income investments	1,442,832,576		1,241,764,327	
• Real estate	601,145,266		585,368,670	
• Capital assets	4,191,866		2,532,109	
• Leased assets	126,648		0	
• Private equity and alternative investments	1,896,947,690		1,854,346,819	
Total investments at market value		*$9,606,164,154*		*$8,767,828,706*
Total assets		**$9,868,947,027**		**$8,938,891,142**
Accounts payable:				
• Securities lending & investments purchased	$(217,563,607)		$(128,455,437)	
• Investment-related payables	(12,191,391)		(11,866,889)	
• Futures contracts & equity swaps	0		(2,631,699)	
• Foreign exchange contracts	(76)		(2,383)	
• Accrued administration expense	(2,858,128)		(2,357,945)	
• Members benefits & refunds, and retirement payroll deductions payable	(6,421,964)		(4,297,739)	
• Lease liability	(144,511)		0	
Total accounts payable		**$(239,179,677)**		**$(149,612,091)**
Net assets at market value		**$9,629,767,350**		**$8,789,279,051**
Net assets at actuarial value		**$8,986,481,645**		**$8,528,590,602**
Net assets at valuation value		**$7,984,240,215**		**$7,599,976,117**

Note: Results may be slightly off due to rounding.

Exhibit F: Summary of Reported Reserve Information as of December 31, 2020

	Reserves
Used in Development of Valuation Value of Assets:	
• Members deposit-basic	$1,339,341,965
• Members cost-of-living	301,155,348
• Employer advance (before transfer from SRBR to employer advance)	1,290,880,442
• Pension reserve-current	1,758,040,338
• Pension reserve-prior	5,783,624
• Annuity reserve	1,033,128,596
• Cost-of-living reserve	2,248,441,827
• Survivor death benefit	(80,608)[1]
• SRBR transfer to employer advance[2]	7,548,683
• Reserve for interest fluctuations (contingency reserve), if negative	0
Subtotal	**$7,984,240,215**[3]
Not Used in Development of Valuation Value of Assets:	
• 401(h) account	$9,051,620
• Supplemental retirees benefit reserve (before transfer from SRBR to employer advance)	931,754,157
• Reserve for interest fluctuations (contingency reserve), if positive	68,984,336
• Market stabilization reserve	643,285,705
• SRBR transfer to employer advance[2]	(7,548,683)
Subtotal	**$1,645,527,135**
Total	**$9,629,767,350**

Note: Results may be slightly off due to rounding.

[1] As outlined in our February 23, 2021 e-mail to ACERA, Segal is available to review potential solutions to address the negative balance in the Survivor Death Benefit Reserve account with the Retirement Association before the completion of the June 30, 2021 interest crediting. This negative balance has no impact on this valuation as the total of all the valuation reserves are used to pay all liabilities.
[2] Estimate provided by ACERA.
[3] A breakdown of this amount between the different cost groups is provided in Section 4, Exhibit VI.

Exhibit G: Development of the Fund through December 31, 2020

Year Ended December 31	Employer Contributions	Member Contributions	Net Investment Return[1]	Benefit Payments	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2011	$162,879,221	$77,990,907	$(53,810,166)	$337,156,660	$5,074,398,182	$5,556,242,772	109.5%
2012	179,648,812	78,608,004	698,682,556	363,133,358	5,668,204,196	5,543,303,209	97.8%
2013	191,180,146	76,230,024	1,095,188,216	390,507,104	6,640,295,478	5,953,454,661	89.7%
2014	213,254,775	79,714,187	266,028,241	411,279,675	6,788,013,006	6,545,159,225	96.4%
2015	224,607,104	82,948,934	(19,960,005)	434,984,266	6,640,624,773	6,987,026,015	105.2%
2016	241,728,451	85,736,229	454,641,033	457,150,304	6,965,580,182	7,309,485,170	104.9%
2017	247,063,550	89,325,824	1,293,322,206	483,192,206	8,112,099,556	7,803,026,229	96.2%
2018	269,684,809	94,735,673	(371,111,618)	512,821,851	7,592,586,569	8,161,706,068	107.5%
2019	298,526,950	103,117,022	1,342,794,800	547,746,289	8,789,279,051	8,528,590,602	97.0%
2020	309,752,998	106,104,226	1,001,415,117[2]	576,784,042	9,629,767,350	8,986,481,645	93.3%

1 On a market basis, net of investment fees and administrative expenses.
2 This amount is different than the net investment income in *Section 3, Exhibit D* since the net market value of assets at the beginning of the year were restated in *Exhibit D*, as provided in the information we received from ACERA; however, the market value of assets at the end of 2019 were not restated in this *Exhibit G*.

Exhibit H: Table of Amortization Bases

General (Excluding LARPD & Office of Education)

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment[1] ($ in '000s)
Combined Bases	December 31, 2011	$885,036	21	$815,060	12	$85,084
Experience Loss	December 31, 2012	165,501	20	151,473	12	15,812
Experience Gain	December 31, 2013	(75,003)	20	(70,329)	13	(6,890)
Experience Gain	December 31, 2014	(156,281)	20	(149,258)	14	(13,802)
Change in Assumptions	December 31, 2014	350,827	20	335,066	14	30,984
Experience Gain	December 31, 2015	(98,619)	20	(95,663)	15	(8,392)
Experience Loss	December 31, 2016	3,655	20	3,585	16	300
Experience Gain	December 31, 2017	(27,249)	20	(26,931)	17	(2,153)
Change in Assumptions	December 31, 2017	260,437	20	257,396	17	20,578
Experience Gain[2]	December 31, 2018	(6,121)	20	(6,091)	18	(467)
Experience Loss	December 31, 2019	74,367	20	74,283	19	5,486
Experience Loss	December 31, 2020	29,771	20	29,771	20	2,122
Change in Assumptions	December 31, 2020	231,791	20	231,791	20	16,520
Subtotal				**$1,550,153**		**$145,182**

1 Level percentage of payroll.
2 Includes the impact of transferring the allocated UAAL for LARPD Tier 1 members to the LARPD cost group and the allocated UAAL for Office of Education Tier 1 members to the Office of Education cost group.

Exhibit H: Table of Amortization Bases (continued)

General (LARPD)[1]

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment[2] ($ in '000s)
Combined Bases	December 31, 2011	$7,060	21	$6,502	12	$679
Experience Loss	December 31, 2012	370	20	338	12	35
Experience Gain	December 31, 2013	(534)	20	(501)	13	(49)
Experience Gain	December 31, 2014	(1,562)	20	(1,493)	14	(138)
Change in Assumptions	December 31, 2014	1,303	20	1,245	14	115
Experience Gain[3]	December 31, 2015	(1,506)	20	(1,462)	15	(128)
Experience Loss	December 31, 2016	139	20	137	16	11
Experience Gain[4]	December 31, 2017	(622)	20	(615)	17	(49)
Change in Assumptions	December 31, 2017	1,418	20	1,402	17	112
Experience Loss[5]	December 31, 2018	1,058	20	1,053	18	81
UAAL for Tier 1 members[6]	December 31, 2018	6,576	20	6,543	18	502
Experience Loss[7]	December 31, 2019	980	20	979	19	72
Experience Gain[8]	December 31, 2020	(2,024)	20	(2,024)	20	(144)
Change in Assumptions	December 31, 2020	1,171	20	1,171	20	83
Subtotal				**$13,275**		**$1,182**

[1] When LARPD General Tier 3 was established in 2008, they were classified as a stand-alone group since they were the only employer with the higher 2.5% at 55 benefit (i.e., Section 31676.18), and the cost to upgrade the past service under that formula was only to be paid by LARPD. (reference: Segal's letter dated October 7, 2008). The initial UAAL rate for that group was based on an allocation of assets needed to maintain the total employer rate from the December 31, 2007 valuation before any benefit improvements for General Tier 3. The UAAL rate for LARPD General Tier 3 was then increased to reflect the benefit improvement. When LARPD General Tier 4 was later established in 2013, that tier was combined with LARPD General Tier 3 for purpose of determining their UAAL rate only (as normal cost for LARPD General Tier 4 has continued to be developed on a pooled basis with other General employers offering General Tier 4 benefits), in order to continue with the open-group level percentage of payroll approach for paying off the UAAL amount for General Tier 3 (that is now closed to new entrants because of CalPEPRA). Furthermore, the Board adopted the declining employer payroll policy in 2018 and determined that the policy applies to LARPD Tier 1. As a result, the UAAL (and associated assets) of LARPD Tier 1 was combined with the UAAL for LARPD Tiers 3 and 4.

[2] Level percentage of payroll.

[3] There is a liability gain from the death of one of LARPD's Tier 3 retirees and the withdrawal of one of LARPD's Tier 3 actives.

[4] There is a liability gain from the death of one of LARPD's Tier 3 retirees.

[5] There is a liability loss mainly from retiree mortality experience for LARPD's Tier 1 and Tier 3 retirees as a result of no actual deaths.

[6] The allocated UAAL for LARPD Tier 1 of $6,167,000 determined as of December 31, 2017 is rolled forward to December 31, 2018 to be amortized starting with the December 31, 2018 valuation.

[7] The loss is primarily due to (a) lower than expected return on investments (after smoothing), (b) actual contributions lower than expected, and (c) higher than expected salary increases for active members.

[8] The gain is primarily due to higher than expected mortality for continuing retirees, from the death of 4 retirees and 1 beneficiary.

Exhibit H: Table of Amortization Bases (continued)

General Combined (Excluding Office of Education)

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment[1] ($ in '000s)
Combined Bases	December 31, 2011	$892,096	21	$821,562	12	$85,763
Experience Loss	December 31, 2012	165,871	20	151,811	12	15,847
Experience Gain	December 31, 2013	(75,537)	20	(70,830)	13	(6,939)
Experience Gain	December 31, 2014	(157,843)	20	(150,751)	14	(13,940)
Change in Assumptions	December 31, 2014	352,130	20	336,311	14	31,099
Experience Gain	December 31, 2015	(100,125)	20	(97,125)	15	(8,520)
Experience Loss	December 31, 2016	3,794	20	3,722	16	311
Experience Gain	December 31, 2017	(27,871)	20	(27,546)	17	(2,202)
Change in Assumptions	December 31, 2017	261,855	20	258,798	17	20,690
Experience Loss	December 31, 2018	1,513	20	1,505	18	116
Experience Loss	December 31, 2019	75,347	20	75,262	19	5,558
Experience Loss	December 31, 2020	27,747	20	27,747	20	1,978
Change in Assumptions	December 31, 2020	232,962	20	232,962	20	16,603
Subtotal				**$1,563,428**		**$146,364**

[1] Level percentage of payroll.

Exhibit H: Table of Amortization Bases (continued)

Safety

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment[1] ($ in '000s)
Combined Bases	December 31, 2011	$598,698	21	$551,364	12	$57,557
Experience Loss	December 31, 2012	63,130	20	57,780	12	6,032
Experience Gain	December 31, 2013	(9,350)	20	(8,769)	13	(859)
Experience Gain	December 31, 2014	(43,238)	20	(41,296)	14	(3,819)
Change in Assumptions	December 31, 2014	107,552	20	102,719	14	9,499
Experience Gain	December 31, 2015	(12,850)	20	(12,466)	15	(1,094)
Experience Loss	December 31, 2016	19,183	20	18,820	16	1,573
Experience Loss	December 31, 2017	6,354	20	6,281	17	502
Change in Assumptions	December 31, 2017	134,184	20	132,616	17	10,602
Experience Loss	December 31, 2018	9,377	20	9,330	18	716
Experience Loss	December 31, 2019	24,143	20	24,115	19	1,781
Experience Loss	December 31, 2020	6,202	20	6,202	20	442
Change in Assumptions	December 31, 2020	88,760	20	88,760	20	6,326
Subtotal				**$935,456**		**$89,258**

[1] Level percentage of payroll.

Exhibit H: Table of Amortization Bases (continued)

Total (Excluding Office of Education)

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment[1] ($ in '000s)
Combined Bases	December 31, 2011	$1,490,794	21	$1,372,926	12	$143,320
Experience Loss	December 31, 2012	229,001	20	209,591	12	21,879
Experience Gain	December 31, 2013	(84,887)	20	(79,599)	13	(7,798)
Experience Gain	December 31, 2014	(201,081)	20	(192,047)	14	(17,759)
Change in Assumptions	December 31, 2014	459,682	20	439,030	14	40,598
Experience Gain	December 31, 2015	(112,975)	20	(109,591)	15	(9,614)
Experience Loss	December 31, 2016	22,977	20	22,542	16	1,884
Experience Gain	December 31, 2017	(21,517)	20	(21,265)	17	(1,700)
Change in Assumptions	December 31, 2017	396,039	20	391,414	17	31,292
Experience Loss	December 31, 2018	10,890	20	10,835	18	832
Experience Loss	December 31, 2019	99,490	20	99,377	19	7,339
Experience Loss	December 31, 2020	33,949	20	33,949	20	2,420
Change in Assumptions	December 31, 2020	321,722	20	321,722	20	22,929
Total				**$2,498,884**		**$235,622**

[1] Level percentage of payroll.

Exhibit H: Table of Amortization Bases (continued)

General (Office of Education)

Type	Date Established	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Annual Payment[1] ($ in '000s)
UAAL for Tier 1 Members	December 31, 2017	$1,357	20	$679	17	$71
Experience Loss	December 31, 2018	61	20	57	18	6
Experience Loss	December 31, 2019	110	20	107	19	11
Experience Loss	December 31, 2020	106	20	106	20	10
Change in Assumptions	December 31, 2020	18	20	18	20	2
Subtotal				**$967**		**$100**
Credit for Expected UAAL Contribution				88[2]		
Total				**$1,055**		

Note: The equivalent amortization period for the entire Plan is about 14 years.

[1] Level dollar, and reflects timing of payment (i.e., next scheduled on April 1, 2022).
[2] $89,000 (as determined in the December 31, 2019 valuation to be payable April 1, 2021), discounted at 7.00% to December 31, 2020.

Exhibit I: Projection of UAAL Balances and Payments

Outstanding Balance of $2,500 Million in Net UAAL as of December 31, 2020

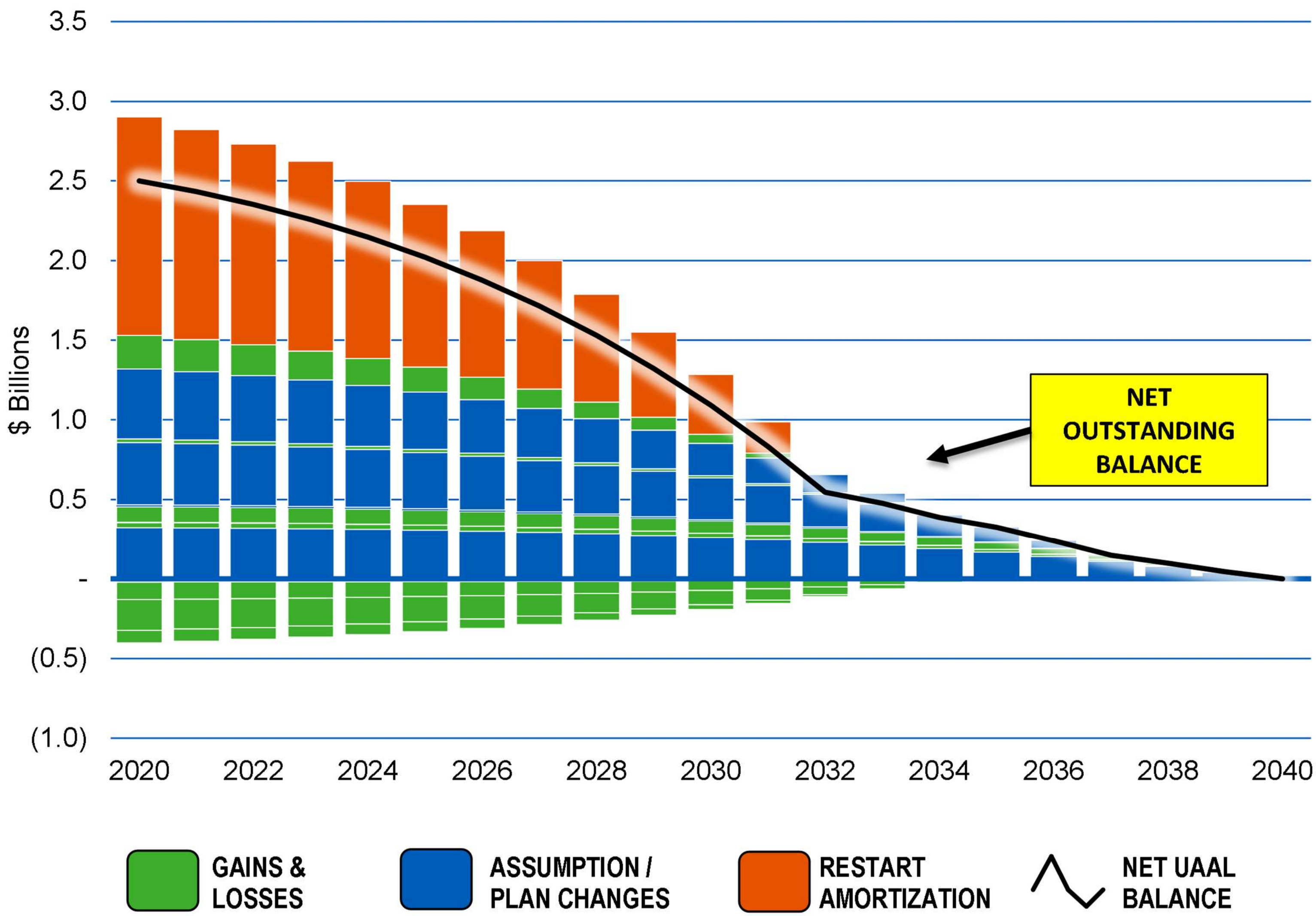


Exhibit I: Projection of UAAL Balances and Payments

Annual Payments Required to Amortize $2,500 Million in Net UAAL as of December 31, 2020

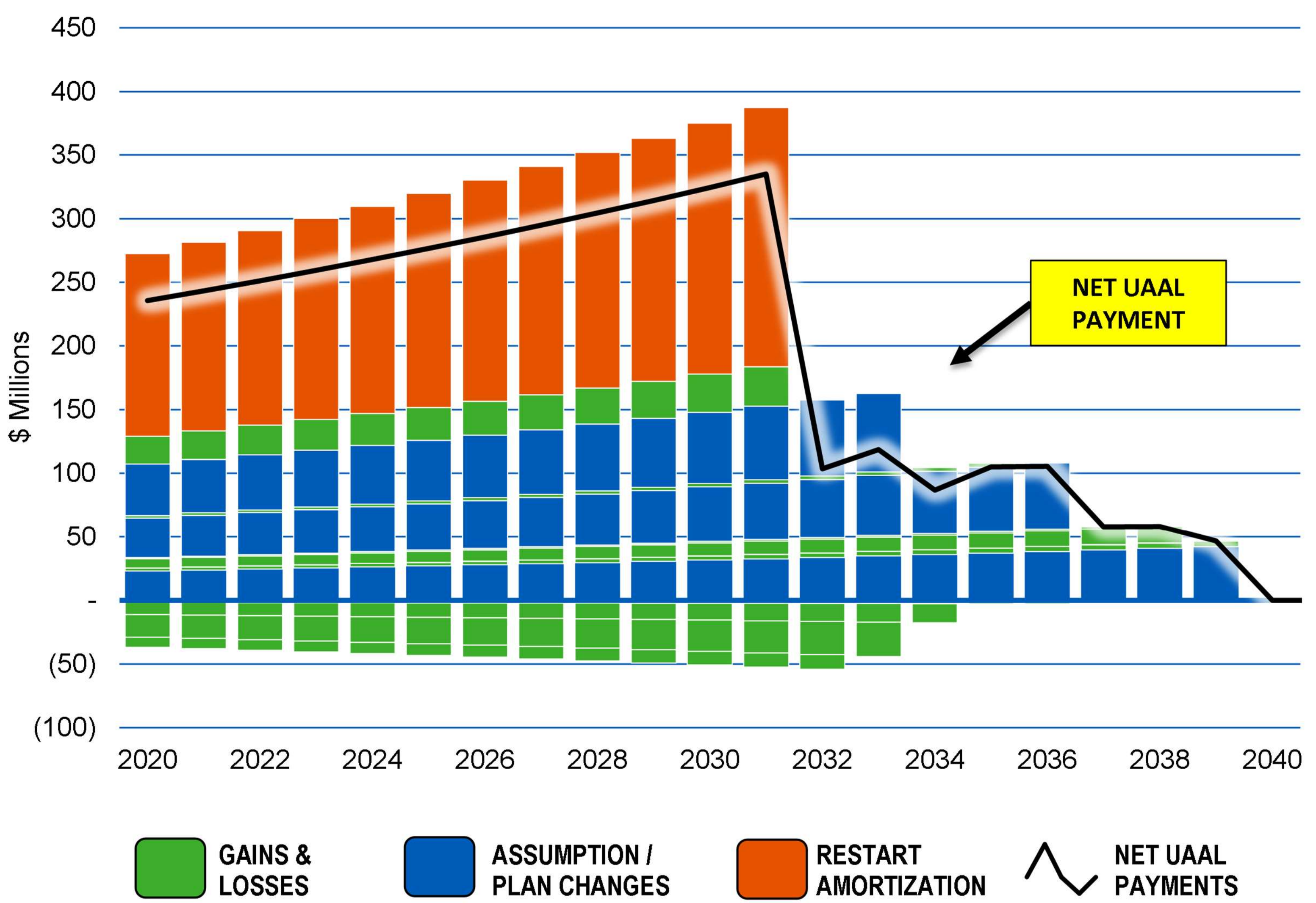


Exhibit J: Definition of Pension Terms

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

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

	beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL).
Actuarial Value of Assets (AVA):	The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Fund is calculated, including: Investment return - the rate of investment yield that the Fund will earn over the long-term future; Mortality rates - the death rates of employees and pensioners; life expectancy is based on these rates; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the probability of disability retirement at a given age; Withdrawal rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation and productivity growth.

Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
Funded Ratio:	The ratio of the valuation value of assets (VVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the VVA.
Investment Return:	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the actuarial assumptions are realized.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Valuation Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.
Valuation Value of Assets:	The Actuarial Value of Assets reduced by the value of non-valuation reserves.

Section 4: Actuarial Valuation Basis

Exhibit I: Actuarial Assumptions and Methods

Rationale for Assumptions:	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the December 1, 2016 through November 30, 2019 Actuarial Experience Study report dated September 9, 2020. Unless otherwise noted, all actuarial assumptions and methods shown below apply to all tiers. These assumptions were adopted by the Board.
<u>Economic Assumptions</u>	
Net Investment Return:	7.00%, net of administrative and investment expenses. Based on the Actuarial Experience Study referenced above, expected administrative and investment expenses represent about 0.95% of the Market Value of Assets.
Employee Contribution Crediting Rate:	7.00%, compounded semi-annually.
Consumer Price Index:	Increase of 2.75% per year. Retiree COLA increases due to CPI are subject to a 2.75% 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. (For General Tier 1, General Tier 3, and Safety Tier 1 members with a sufficient COLA bank, withdrawals from the bank can be made to increase the retiree COLA up to 3% per year.) The actual COLA granted by ACERA on April 1, 2021 has been reflected in the December 31, 2020 valuation.
Payroll Growth:	Inflation of 2.75% per year plus real "across the board" salary increases of 0.50% per year, used to amortize the Unfunded Actuarial Accrued Liability as a level percentage of payroll.
Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 2.75% per year from the valuation date.
Increase in Section 7522.10 Compensation Limit:	Increase of 2.75% per year from the valuation date.

Salary Increases:

The annual rate of compensation increase includes:

- Inflation at 2.75%, plus
- "Across the board" salary increases of 0.50% per year, plus
- The following merit and promotion increases:

Years of Service	Rate (%) General	Rate (%) Safety
0-1	5.10	8.00
1-2	5.10	8.00
2-3	4.50	8.00
3-4	2.90	4.90
4-5	2.10	3.70
5-6	1.60	2.10
6-7	1.50	1.30
7-8	1.50	1.20
8-9	1.00	0.90
9-10	0.90	0.90
10-11	0.70	0.80
11 & Over	0.40	0.80

Additional Cashout Assumptions:

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

	Service Retirement	Disability Retirement
General Tier 1	7.5%	6.5%
General Tier 2	3.0%	1.4%
General Tier 3	7.5%	6.5%
General Tier 4	N/A	N/A
Safety Tier 1	7.5%	6.4%
Safety Tier 2	2.5%	1.9%
Safety Tier 2C	2.5%	1.9%
Safety Tier 2D	2.5%	1.9%
Safety Tier 4	N/A	N/A

Demographic Assumptions:	
Post-Retirement Mortality Rates:	*Healthy* • **General Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019. • **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019. *Disabled* • **General Members:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Tables (separate tables for males and females) with rates decreased 10% for females, projected generationally with the two-dimensional mortality improvement scale MP-2019. • **Safety Members:** Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2019. *Beneficiaries* • **All Beneficiaries:** Pub-2010 General Contingent Survivor Amount-Weighted Above-Median Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2019. The Pub-2010 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. These mortality tables were adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

Pre-Retirement Mortality Rates:

- **General Members:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019.
- **Safety Members:** Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019.

	Rate (%)			
	General[1]		Safety[1]	
Age	Male	Female	Male	Female
20	0.04	0.01	0.04	0.02
25	0.02	0.01	0.03	0.02
30	0.04	0.01	0.04	0.02
35	0.04	0.02	0.04	0.03
40	0.06	0.03	0.05	0.04
45	0.09	0.05	0.07	0.06
50	0.13	0.08	0.10	0.08
55	0.19	0.11	0.15	0.11
60	0.28	0.17	0.23	0.15
65	0.41	0.27	0.35	0.20

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

[1] Generational projections beyond the base year (2010) are not reflected in the above mortality rates.

Mortality Rates for Member Contributions:

- **General Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected 30 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 30% male and 70% female.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected 30 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 75% male and 25% female.

Optional Forms of Benefit:

Service Retirement and All Beneficiaries

- **General Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected 25 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 30% male and 70% female.
- **General Beneficiaries:** Pub-2010 General Contingent Survivor Amount-Weighted Above-Median Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected 25 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 70% male and 30% female.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected 25 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 75% male and 25% female.
- **Safety Beneficiaries:** Pub-2010 General Contingent Survivor Amount-Weighted Above-Median Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected 25 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 25% male and 75% female.

Disability Retirement

- **General Members:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Tables (separate tables for males and females) with rates decreased 10% for females, projected 25 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 30% male and 70% female.
- **Safety Members:** Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected 25 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 75% male and 25% female.

Disability Incidence:

	Rate (%)	
Age	**General**	**Safety**
20	0.00	0.00
25	0.01	0.03
30	0.03	0.26
35	0.07	0.64
40	0.09	1.22
45	0.16	1.50
50	0.26	2.10
55	0.33	2.65
60	0.38	3.80

65% of General disabilities are assumed to be service connected disabilities. The other 35% are assumed to be non-service connected disabilities.

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

Termination:

Years of Service	Rate (%) General	Rate (%) Safety
0-1	12.00	4.00
1-2	9.00	4.00
2-3	8.00	4.00
3-4	6.00	3.50
4-5	6.00	3.00
5-6	6.00	2.00
6-7	5.25	1.80
7-8	4.25	1.70
8-9	3.75	1.60
9-16	3.50	1.50
16-17	3.40	1.40
17-18	3.30	1.30
18-19	3.20	1.20
19-20	3.10	1.10
20 or more	3.00	1.00

For members with less than five years of service, 55% of all terminated members are assumed to choose a refund of contributions and the other 45% are assumed to choose a deferred vested benefit. For members with five or more years of service, 30% of all terminated members are assumed to choose a refund of contributions and the other 70% are assumed to choose a deferred vested benefit.

No termination is assumed after a member is eligible for retirement.

Retirement Rates:

	Rate (%)[1]									
	General					Safety				
		Tier 2[2]					Tier 2, 2D[2]			
Age	Tier 1	< 30	30+	Tier 3	Tier 4	Tier 1[3]	< 30	30+	Tier 2C[3]	Tier 4
49	0.0	0.0	0.0	0.0	0.0	0.0	12.0	18.0	0.0	0.0
50	2.0	2.0	4.0	10.0	0.0	35.0	12.0	18.0	4.0	4.0
51	4.0	2.0	4.0	10.0	0.0	30.0	10.0	24.0	2.0	2.0
52	4.0	2.0	4.0	10.0	4.0	25.0	10.0	24.0	2.0	2.0
53	5.0	2.0	4.0	10.0	2.0	35.0	10.0	25.0	3.0	3.0
54	5.0	2.0	4.0	10.0	2.0	45.0	12.0	27.0	6.0	6.0
55	6.0	2.0	4.0	12.0	5.0	45.0	12.0	29.0	10.0	10.0
56	10.0	2.5	4.5	14.0	2.5	45.0	14.0	32.0	12.0	12.0
57	12.0	4.0	5.0	16.0	3.5	45.0	16.0	32.0	20.0	20.0
58	12.0	4.0	5.0	18.0	3.5	45.0	18.0	30.0	10.0	10.0
59	14.0	4.5	8.0	20.0	4.5	45.0	18.0	30.0	15.0	15.0
60	20.0	8.0	8.5	20.0	5.0	45.0	25.0	30.0	60.0	60.0
61	20.0	9.0	13.5	20.0	5.0	45.0	25.0	30.0	60.0	60.0
62	35.0	15.0	22.5	30.0	18.0	45.0	25.0	30.0	60.0	60.0
63	30.0	15.0	22.5	25.0	15.0	45.0	25.0	30.0	60.0	60.0
64	30.0	18.0	27.0	25.0	17.0	45.0	30.0	30.0	60.0	60.0
65	30.0	25.0	27.5	50.0	25.0	100.0	100.0	100.0	100.0	100.0
66	30.0	30.0	33.0	50.0	30.0	100.0	100.0	100.0	100.0	100.0
67	30.0	30.0	33.0	50.0	30.0	100.0	100.0	100.0	100.0	100.0
68	30.0	30.0	33.0	50.0	30.0	100.0	100.0	100.0	100.0	100.0
69	35.0	35.0	38.5	50.0	35.0	100.0	100.0	100.0	100.0	100.0
70	40.0	40.0	40.0	65.0	25.0	100.0	100.0	100.0	100.0	100.0
71	40.0	40.0	40.0	65.0	25.0	100.0	100.0	100.0	100.0	100.0
72	40.0	40.0	40.0	65.0	25.0	100.0	100.0	100.0	100.0	100.0
73	40.0	40.0	40.0	65.0	25.0	100.0	100.0	100.0	100.0	100.0
74	40.0	40.0	40.0	65.0	25.0	100.0	100.0	100.0	100.0	100.0
75 & Over	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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

[2] Different retirement rates are assumed for General Tier 2 and Safety Tier 2 & 2D members who have accrued less than 30 years of service and those who have accrued at least 30 years of service.

[3] Retirement rate is 100% after a member accrues a benefit of 100% of final average earnings.

Section 4: Actuarial Valuation Basis

Retirement Age and Benefit for Deferred Vested Members:	General Retirement Age: 61 Safety Retirement Age: 55 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. 25% of future General and 50% of future Safety deferred vested members are assumed to continue to work for a reciprocal employer. For reciprocals, 3.65% and 4.05% 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 0.007 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 Adjustment:	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 and Gender of Spouse:	For all active and inactive members, male members are assumed to have a female spouse who is 3 years younger than the member and female members are assumed to have a male spouse who is 2 years older than the member.
<u>Actuarial Funding Policy</u>	
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is the age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation, as if the current benefit formula for each individual has always been in effect.
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.

Amortization Policy:	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 12 years remaining as of December 31, 2020). 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. ACOE's UAAL amortization under the declining employer payroll policy is level dollar.
Other Actuarial Methods	
Employer Contributions:	Employer contributions consist of two components: *Normal Cost* The annual contribution rate that, if paid annually from a member's first year of membership through the year of retirement, would accumulate to the amount necessary to fully fund the member's retirement-related benefits. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution rate is expressed as a level percentage of the member's compensation. *Contribution to the Unfunded Actuarial Accrued Liability (UAAL)* The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earning rate. The contribution (or rate credit in the case of a negative UAAL) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the Association) assuming a constant number of active members. In order to remain as a level percentage of payroll, amortization payments (credits) are scheduled to increase at the annual rate of 3.25% (i.e., 2.75% inflation plus 0.50% across-the-board salary increase). The amortization policy is described above. Alameda County previously issued pension obligation bonds (POB) and the net bond proceeds were contributed to ACERA. When the POBs were issued, AHS, Court and First 5 were part of the County and, consequently, they share in the proceeds. The net bond proceeds contributed to ACERA allow the Association to provide a "Pension Obligation Bond Credit" to these employers, thereby reducing their employer contribution rate. As of December 31, 2020, the outstanding balances of the POBs were $485.4 million for the General employers (County, AHS, Court, and First 5) and $90.9 million for the Safety employers (County). For several years, the Board of Retirement has approved transfers from the SRBR to the Employer Advance Reserve to reimburse the County for their payment of the implicit retiree health benefit subsidy. The amortization credits resulting from these transfers have served to reduce the County's employer contribution rates. The recommended employer contributions are provided in *Section 2, Subsection F*. These rates reflect the POB credits for the County, AHS, Court, and First 5, and the retiree health benefit subsidy credits for the County, noted above.

Member Contributions:

Non-Tier 4 Members

Articles 6 and 6.8 of the 1937 Act define the methodology to be used in the calculation of member basic contribution rates for non-Tier 4 General and Safety members, respectively. The basic contribution rate is determined so that the accumulation of a member's basic contributions made in a given year until a certain age will be sufficient to fund an annuity at that age that is equal to 1/100 of Final Average Salary for General Tier 1, General Tier 3, and all Safety non-Tier 4 members and 1/120 of Final Average Salary for General Tier 2 members. That age is 60 for General Tier 1 and Tier 2, 55 for General Tier 3, and 50 for all Safety non-Tier 4 members. It is assumed that contributions are made annually at the same rate, starting at entry age. In addition to the basic contributions, members pay one-half of the total normal cost necessary to fund cost-of-living benefits. As instructed by ACERA, we have also included a 3% cost-sharing contribution that we understand will be paid by Safety Tier 1 and Tier 2 members. For Safety Tier 2C members, there are no cost-sharing contributions. For Safety Tier 2D members, the cost-sharing contribution rate is 5% of salary for the first 5 years of vesting service and 3% of salary for each subsequent year of vesting service. (The 3% cost-sharing contribution for Safety Tiers 1, 2, and 2D (after 5 years of service) will continue even after the member attains 30 years of service.)

Accumulation includes semi-annual crediting of interest at the assumed investment earnings rate. Following the procedure established by the Board, basic member rates have been adjusted to anticipate conversion of additional cashout at retirement.

Tier 4 Members

Pursuant to Section 7522.30(a) of the Government Code, Tier 4 members are required to contribute at least 50% of the Normal Cost rate.

When previously calculating member rates, there were certain additional requirements that had to be met such as requiring the employee rates be rounded to the nearest one quarter of one percent and requiring the new employees to pay the contribution rate of "similarly situated employees", if it is greater. (reference: Section 7522.30(c)). Furthermore, Section 7522.30(d) indicated that "once established, the employee contribution rate described in subdivision (c) shall not be adjusted on account of a change to the normal cost rate unless the normal cost rate increases or decreases by more than 1 percent of payroll above or below the normal cost rate in effect at the time the employee contribution rate is first established or, if later, the normal cost rate in effect at the time of the last adjustment to the employee contribution rate under this section."

However, as we referenced in our letter dated February 26, 2014, Assembly Bill 1380 (AB 1380) was approved by the Governor on September 6, 2013. In particular, Section 31620.5(a) was added to the Government Code to provide the Board with the discretion to not apply the rounding previously required under Section 7522.30(c). We understand that our recommendation in that letter to no longer apply the rounding rule effective with the December 31, 2013 valuation was adopted by the Board, and the results in this valuation reflect that action taken by the Board.

Section 31620.5(b) of AB 1380 also stipulates that the "one percent rule" under Section 7522.30(d) "shall not apply to the contribution rates of members of retirement systems established pursuant to this chapter."

Therefore, in preparing the Normal Cost rates in this report, we have assumed that exactly 50% of the Normal Cost would be paid by the Tier 4 members.

The member contribution rates for all members are provided in *Section 4, Exhibit III*.

Internal Revenue Code Section 415:	Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual's account in a defined contribution plan. A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active participants could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan's assets. In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar limit of $160,000 indexed for inflation. That limit is $230,000 for 2020 and 2021. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must be adjusted based on each participant's circumstances, for such things as age at retirement, form of benefits chosen and after tax contributions. Non-Tier 4 benefits in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m). Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard. Non-Tier 4 contribution rates determined in this valuation have not been reduced for the Section 415 limitations. Actual limitations will result in gains as they occur.

Changed Actuarial Assumptions:	Based on the December 1, 2016 through November 30, 2019 Actuarial Experience Study report dated September 9, 2020, various actuarial assumptions were updated. The prior actuarial assumptions are shown below.
Prior Actuarial Assumptions:	Prior assumptions were based on the December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017.
Economic Assumptions	
Net Investment Return:	7.25%; net of administrative and investment expenses. Expected administrative and investment expenses represent about 0.90% of the Market Value of Assets.
Employee Contribution Crediting Rate:	7.25%, compounded semi-annually.
Consumer Price Index:	Increase of 3.00% per year. Retiree COLA increases due to CPI are 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, used to amortize the Unfunded Actuarial Accrued Liability as a level percentage of payroll.
Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 3.00% per year from the valuation date.
Increase in Section 7522.10 Compensation Limit:	Increase of 3.00% per year from the valuation date.

Prior Actuarial Assumptions (continued): Prior assumptions were based on the December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017.

Economic Assumptions (continued)

Salary Increases:

The annual rate of compensation increase includes:

- Inflation at 3.00%, plus
- "Across the board" salary increases of 0.50% per year, plus
- The following merit and promotion increases:

Years of Service	Rate (%) General	Rate (%) 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 & Over	0.40	0.80

Additional Cashout Assumptions:

Additional pay elements are expected to be received during a member's final average earnings period. The percentages, added to the final average 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

Prior Actuarial Assumptions (continued):	Prior assumptions were based on the December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017.
Demographic Assumptions	
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. *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.

	Rate (%)			
	General[1]		Safety[1]	
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

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

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

Prior Actuarial Assumptions (continued):	Prior assumptions were based on the December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017.
Demographic Assumptions (continued)	
Mortality Rates for Member Contributions:	• **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. • **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.

Prior Actuarial Assumptions (continued):

Prior assumptions were based on the December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017.

Demographic Assumptions (continued)

Disability Incidence:

	Rate (%)	
Age	**General**	**Safety**
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

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

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

Prior Actuarial Assumptions (continued):

Prior assumptions were based on the December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017.

Demographic Assumptions (continued)

Termination:

Less Than Five Years of Service

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

60% of all terminated members with less than 5 years of service are assumed to choose a refund of contributions. The other 40% are assumed to choose a deferred vested benefit.

Five or More Years of Service

Age	Rate (%) General	Rate (%) 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

35% of all terminated members with 5 or more years of service 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).

Prior Actuarial Assumptions (continued): Prior assumptions were based on the December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017.

Demographic Assumptions (continued)

Retirement Rates:

	Rate (%)[1]							
	General				Safety			
Age	Tier 1	Tier 2	Tier 3	Tier 4	Tier 1[2]	Tier 2, 2D[2]	Tier 2C[2]	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.

Prior Actuarial Assumptions (continued):	Prior assumptions were based on the December 1, 2013 through November 30, 2016 Actuarial Experience Study report dated September 6, 2017.
Demographic Assumptions (continued)	
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.

Exhibit II: Summary of Plan Provisions

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

Plan Year:	January 1 through December 31
Membership Eligibility:	Membership with ACERA usually begins with the second pay period following appointment to a full time County or member District position. For Housing Authority and LARPD, membership with ACERA begins on the first day of hire. ACERA members who change from full time to part time will continue to participate at ACERA.
General and Safety Tier 1	All General and Safety members hired on or before June 30, 1983. For Housing Authority General members, the hire date is on or before September 30, 2011 (instead of June 30, 1983). For LARPD General members, the hire date is on or before September 30, 2008 (instead of June 30, 1983).
General and Safety Tier 2	All General and Safety members hired after June 30, 1983, and not in any of the other Tiers listed below. For Housing Authority General members, the hire date is after September 30, 2011 (instead of June 30, 1983).
General Tier 3	Only General LARPD members hired before October 1, 2008 who elected the 2.5% at 55 formula and all General LARPD members hired after that date.
General and Safety Tier 4	All General and Safety members with membership dates on or after January 1, 2013.
Safety Tier 2C	All Safety members in the Sheriff's Department (excluding Probation Officers) hired on or after October 17, 2010 who elected the 2% at 50 formula.
Safety Tier 2D	All Safety members in the Sheriff's Department (excluding Probation Officers) hired on or after October 17, 2010 who elected the 3% at 55 formula.
Final Compensation for Benefit Determination:	
General Tier 1, General Tier 3 and Safety Tier 1	Highest consecutive 12 months of compensation earnable (§31462.1) (FAS1).
General Tier 2, General Tier 4, Safety Tier 2, Safety Tier 2C, Safety Tier 2D, and Safety Tier 4	For non-Tier 4 members, highest consecutive 36 months of compensation earnable (§31462), and for Tier 4 members, highest consecutive 36 months of pensionable compensation (§7522.10(c), §7522.32 and §7522.34) (FAS3).
Compensation Limit:	
Non-Tier 4	For members with membership dates on or after July 1, 1996, compensation earnable is limited by Internal Revenue Code Section 401(a)(17). The limit for 2021 is $290,000. The limit is indexed for inflation on an annual basis.

Tier 4	Pensionable compensation is limited to $128,059 for 2021 for an employer that is enrolled in Social Security. For an employer that is not enrolled in Social Security, the maximum amount for 2021 is 120% of $128,059, or $153,671. (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2021. (reference: Section 7522.10(d)).
Service:	Years of service (Yrs) are generally based on a member's employment during a period of time for which deductions are made from their compensation.
Service Retirement Eligibility:	
General	
Non-Tier 4	Age 50 with 5 years of service and a total of 10 years of qualifying membership, or age 70 regardless of service, or after 30 years of service regardless of age (§31672).
Tier 4	Age 52 with 5 years of service (§7522.20(a)) or age 70 regardless of service (§31672.3).
Safety	
Non-Tier 4	Age 50 with 5 years of service and a total of 10 years of qualifying membership, or age 70 regardless of service, or after 20 years of service regardless of age (§31663.25).
Tier 4	Age 50 with 5 years of service (§7522.25(d)) or age 70 regardless of service (§31672.3).

Benefit Formula:		
General Tier 1 (§31676.12)	**Retirement Age**	**Benefit Formula**
	50	1.34% x (FAS1 – $1,400) x Yrs
	55	1.77% x (FAS1 – $1,400) x Yrs
	60	2.34% x (FAS1 – $1,400) x Yrs
	62 and over	2.62% x (FAS1 – $1,400) x Yrs
General Tier 2 (§31676.1)	**Retirement Age**	**Benefit Formula**
	50	1.18% x (FAS3 – $1,400) x Yrs
	55	1.49% x (FAS3 – $1,400) x Yrs
	60	1.92% x (FAS3 – $1,400) x Yrs
	62	2.09% x (FAS3 – $1,400) x Yrs
	65 and over	2.43% x (FAS3 – $1,400) x Yrs
General Tier 3 (§31676.18)	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAS1 x Yrs
	55 and over	2.50% x FAS1 x Yrs
General Tier 4 (§7522.20(a))	**Retirement Age**	**Benefit Formula**
	52	1.00% x FAS3 x Yrs
	55	1.30% x FAS3 x Yrs
	60	1.80% x FAS3 x Yrs
	62	2.00% x FAS3 x Yrs
	65	2.30% x FAS3 x Yrs
	67 and over	2.50% x FAS3 x Yrs
Safety Tier 1 (Non-Integrated) (§31664.1)	**Retirement Age**	**Benefit Formula**
	50 and over	3.00% x FAS1 x Yrs
Safety Tier 2 (Non-Integrated) (§31664.1)	**Retirement Age**	**Benefit Formula**
	50 and over	3.00% x FAS3 x Yrs

Safety Tier 2C (Non-Integrated) (§31664)	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAS3 x Yrs
	55 and over	2.62% x FAS3 x Yrs
Safety Tier 2D (Non-Integrated) (§31664.2)	**Retirement Age**	**Benefit Formula**
	50	2.29% x FAS3 x Yrs
	55 and over	3.00% x FAS3 x Yrs
Safety Tier 4 (Non-Integrated) (§7522.25(d))	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAS3 x Yrs
	55	2.50% x FAS3 x Yrs
	57 and over	2.70% x FAS3 x Yrs

Maximum Benefit:	
Non-Tier 4	100% of Highest Average Compensation (§31676.1, §31676.12, §31676.18, §31664, §31664.1, and §31664.2).
Tier 4	None.
Non-Service Connected Disability:	
General Tier 1, Tier 2, Tier 3, and Tier 4	
Eligibility	Five years of service (§31720).
Benefit Formula	1.8% of Final Compensation per year of service for General Tier 1 and Tier 3 and 1.5% of Final Compensation per year of service for General Tier 2 and Tier 4. If the benefit does not exceed one-third of Final Compensation, the service is projected to 62 for General Tier 1 and Tier 3, and to age 65 for General Tier 2 and Tier 4, but the total benefit cannot be more than one-third of Final Compensation (§31727.1 and §31727).
Safety Tier 1, Tier 2, Tier 2C, Tier 2D and Tier 4	
Eligibility	Five years of service (§31720).
Benefit Formula	1.8% of Final Compensation per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 55, but the total benefit cannot be more than one-third of Final Compensation (§31727.2).

Service Connected Disability:	
All Members	
Eligibility	No age or service requirements (§31720).
Benefit Formula	50% of the Final Compensation or 100% of Service Retirement benefit, if greater (§31727.4).
Pre-Retirement Death:	
All Members	
Eligibility	None.
Basic Lump Sum Benefit	Refund of employee contributions with interest, plus one month's compensation for each year of service, to a maximum of six month's compensation (§31781).
Service Connected Death	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).
	OR
Vested Members	
Eligibility	Five years of service.
Basic Benefit	60% of the greater of Service or Non-Service Connected Disability Retirement benefit payable to surviving eligible spouse (§31765.1, §31781.1), in lieu of the basic lump sum benefit above.
Service Connected Death	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787).
Death After Retirement:	
All Members	
Service Retirement or Non-Service Connected Disability Retirement	Unless another option was selected at retirement, 60% of member's unmodified allowance continues to eligible spouse (§31760.1) and lump sum death burial benefit payable to member's beneficiary (§31789.3). An eligible spouse is a surviving spouse who was married to the member at least one year prior to the date of retirement (§31760.1). Based on action taken by the Board in February 2014, we are continuing to exclude the death burial benefit from the pension valuation.
Service Connected Disability	Unless another option was selected at retirement, 100% of member's allowance continued to eligible spouse (§31786).

Withdrawal Benefits:	
Less than Five Years of Service	Refund of accumulated employee contributions with interest, or benefit at age 70 (§31628). Effective January 1, 2003, a member may also elect to leave contributions on deposit in the retirement fund (§31629.5).
Five or More Years of Service	If contributions left on deposit, entitled to earned benefits commencing at any time after eligible to retire (§31700).
Post-retirement Cost-of-Living Benefits:	
General Tier 1, General Tier 3 and Safety Tier 1	Annual adjustment based on Consumer Price Index to a maximum of 3% per year; excess "banked" (§31870.1).
General Tier 2, General Tier 4 Safety Tier 2, Safety Tier 2C, Safety Tier 2D, and Safety Tier 4	Annual adjustment based on Consumer Price Index to a maximum of 2% per year; excess "banked" (§31870).
Supplemental Benefit:	Non-vested supplemental COLA and medical benefits are also paid from the Supplemental Retirees Benefit Reserve to eligible retirees and survivors. These benefits have been excluded from this valuation.
Member Contributions:	Please refer to *Section 4, Exhibit III* for specific rates.
General Tier 1	
Basic	Entry-age based rates that provide for an average annuity at age 60 equal to 1/100 of FAS1 (§31621.2).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
General Tier 2	
Basic	Entry-age based rates that provide for an average annuity at age 60 equal to 1/120 of FAS3 (§31621).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
General Tier 3	
Basic	Entry-age based rates that provide for an average annuity at age 55 equal to 1/100 of FAS1 (§31621.8).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
General Tier 4	50% of the total Normal Cost rate.

Safety Non-Tier 4	
Basic	Entry-age based rates that provide for an average annuity at age 50 equal to 1/100 of FAS1 (FAS3 for Tier 2, Tier 2C, and Tier 2D) (§31639.25). As instructed by ACERA, we have also included a 3% cost-sharing contribution that we understand will be paid by Safety Tier 1 and Tier 2 members. For Safety Tier 2C members, there are no cost-sharing contributions. For Safety Tier 2D members, the cost-sharing contribution rate is 5% of salary for the first 5 years of vesting service and 3% of salary for each subsequent year of vesting service. (The 3% cost-sharing contribution for Safety Tiers 1, 2, and 2D (after 5 years of service) will continue even after the member attains 30 years of service.)
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
Safety Tier 4	50% of the total Normal Cost rate.
Other Information:	Except for the 3% cost-sharing contribution described above, non-Tier 4 Safety members are exempt from paying member contributions after 30 or more years of service. This exemption also applies for General members hired on or before March 7, 1973.
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.

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

Exhibit III: Member Contribution Rates

Comparison of Total Member Rate[1] from December 31, 2020 (New) and December 31, 2019 (Current) Valuations:

General Tier 1

Entry Age	Current	New	Change
25	9.31%	9.58%	**0.27%**
35	11.26%	11.59%	**0.33%**
45	13.59%	14.04%	**0.45%**

General Tier 2

Entry Age	Current	New	Change
25	6.44%	6.91%	**0.47%**
35	7.78%	8.35%	**0.57%**
45	9.38%	10.12%	**0.74%**

General Tier 3

Entry Age	Current	New	Change
25	11.20%	11.90%	**0.70%**
35	13.51%	14.39%	**0.88%**
45	16.37%	17.49%	**1.12%**

General Tier 4

Entry Age[2]	Current	New	Change
Any	8.85%	9.21%	**0.36%**

Safety Tier 1

Entry Age	Current	New	Change
25	17.68%	18.16%	**0.48%**
30	18.95%	19.49%	**0.54%**
35	20.39%	20.99%	**0.60%**

Safety Tier 2

Entry Age	Current	New	Change
25	15.14%	16.13%	**0.99%**
30	16.20%	17.27%	**1.07%**
35	17.37%	18.56%	**1.19%**

Safety Tier 2C

Entry Age	Current	New	Change
25	11.57%	12.74%	**1.17%**
30	12.58%	13.85%	**1.27%**
35	13.69%	15.11%	**1.42%**

Safety Tier 2D (with less than 5 years of vesting service)

Entry Age	Current	New	Change
25	16.99%	18.04%	**1.05%**
30	18.04%	19.17%	**1.13%**
35	19.20%	20.46%	**1.26%**

Safety Tier 2D (with 5 or more years of vesting service)

Entry Age	Current	New	Change
25	14.99%	16.04%	**1.05%**
30	16.04%	17.17%	**1.13%**
35	17.20%	18.46%	**1.26%**

Safety Tier 4

Entry Age[2]	Current	New	Change
Any	15.42%	16.93%	**1.51%**

[1] For the non-CalPEPRA tiers, contributions for the first $161 of biweekly payroll are based on 2/3 of the above rates for integrated members.
[2] Tier 4 member rates are independent of entry age.

Exhibit III: Member Contribution Rates (continued)

Breakdown of member rate between basic and COLA calculated in the December 31, 2020 and December 31, 2019 valuations:

	December 31, 2020 Actuarial Valuation								December 31, 2019 Actuarial Valuation[1]							
	BASIC		COLA		COST SHARING CONTRIBUTIONS[2]		TOTAL		BASIC		COLA		COST SHARING CONTRIBUTIONS[2]		TOTAL	
	Rate	Estimated Annual Amount[3]	Rate	Estimated Annual Amount[3]	Rate	Estimated Annual Amount[3]	Rate	Estimated Annual Amount[3]	Rate	Estimated Annual Amount[3]	Rate	Estimated Annual Amount[3]	Rate	Estimated Annual Amount[3]	Rate	Estimated Annual Amount[3]
General Tier 1	7.35%	$806	2.51%	$275			9.86%	$1,081	6.96%	$763	2.63%	$289			9.59%	$1,052
General Tier 2	6.55%	36,635	1.67%	9,341			8.22%	45,976	6.15%	34,398	1.50%	8,390			7.65%	42,788
General Tier 3	10.43%	185	4.57%	81			15.00%	266	9.85%	175	4.22%	74			14.07%	249
General Tier 4	7.47%	30,151	1.74%	7,024			9.21%	37,175	7.22%	29,142	1.63%	6,580			8.85%	35,722
Safety Tier 1	0.00%	0	0.00%	0	3.00%	$15	3.00%	15	0.00%	0	0.00%	0	3.00%	$15	3.00%	15
Safety Tier 2	9.69%	10,639	4.26%	4,677	3.00%	3,294	16.95%	18,610	9.13%	10,024	3.76%	4,128	3.00%	3,294	15.89%	17,446
Safety Tier 2C	10.50%	303	4.15%	120	0.00%	0	14.65%	423	9.88%	285	3.41%	99	0.00%	0	13.29%	384
Safety Tier 2D	9.87%	1,635	4.25%	704	3.05%	505	17.17%	2,844	9.30%	1,540	3.67%	608	3.05%	505	16.02%	2,653
Safety Tier 4	13.19%	6,631	3.74%	1,880	0.00%	0	16.93%	8,511	12.16%	6,113	3.26%	1,639	0.00%	0	15.42%	7,752
All Tiers Combined	**7.53%**	**$86,985**	**2.08%**	**$24,102**	**0.33%**	**$3,814**	**9.94%**	**$114,901**	**7.13%**	**$82,440**	**1.89%**	**$21,807**	**0.33%**	**$3,814**	**9.35%**	**$108,061**

[1] These rates have been re-calculated by applying the individual entry age based member rates determined in December 31, 2019 valuation to the Association membership as of December 31, 2020.

[2] Cost sharing contributions for Safety Tier 2D members are determined based on proportion of members contributing 5.00% (with less than 5 years of vesting service) and 3.00% (with 5 or more years of vesting service).

[3] Amounts are in thousands and are based on December 31, 2020 annual payroll (also in thousands):

	County	AHS, Court & First 5	Housing Authority	LARPD	Total
General Tier 1	$6,200	$1,170	$3,061	$537	$10,968
General Tier 2	379,552	179,515	248		559,315
General Tier 3				1,773	1,773
General Tier 4	245,987	154,571	1,692	1,384	403,634
Safety Tier 1	491				491
Safety Tier 2	109,794				109,794
Safety Tier 2C	2,887				2,887
Safety Tier 2D	16,563				16,563
Safety Tier 4	50,272				50,272
Total	$811,746	$335,256	$5,001	$3,694	$1,155,697

Exhibit III: Member Contribution Rates (continued)

General Tier 1 Members' Contribution Rates Based on the December 31, 2020 Actuarial Valuation (as a % of biweekly payroll)

	General Tier 1					
	Basic		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
16 & Under	3.99%	5.99%	1.36%	2.04%	5.35%	8.03%
17	4.07%	6.11%	1.39%	2.09%	5.46%	8.20%
18	4.15%	6.23%	1.42%	2.13%	5.57%	8.36%
19	4.24%	6.35%	1.45%	2.17%	5.69%	8.52%
20	4.32%	6.48%	1.47%	2.21%	5.79%	8.69%
21	4.40%	6.61%	1.51%	2.26%	5.91%	8.87%
22	4.49%	6.74%	1.53%	2.30%	6.02%	9.04%
23	4.58%	6.87%	1.56%	2.34%	6.14%	9.21%
24	4.67%	7.00%	1.59%	2.39%	6.26%	9.39%
25	4.76%	7.14%	1.63%	2.44%	6.39%	9.58%
26	4.85%	7.28%	1.65%	2.48%	6.50%	9.76%
27	4.95%	7.42%	1.69%	2.53%	6.64%	9.95%
28	5.04%	7.56%	1.72%	2.58%	6.76%	10.14%
29	5.14%	7.71%	1.75%	2.63%	6.89%	10.34%
30	5.24%	7.86%	1.79%	2.68%	7.03%	10.54%
31	5.34%	8.01%	1.82%	2.73%	7.16%	10.74%
32	5.44%	8.16%	1.86%	2.79%	7.30%	10.95%
33	5.54%	8.32%	1.89%	2.84%	7.43%	11.16%
34	5.65%	8.48%	1.93%	2.89%	7.58%	11.37%
35	5.76%	8.64%	1.97%	2.95%	7.73%	11.59%
36	5.87%	8.80%	2.01%	3.01%	7.88%	11.81%
37	5.98%	8.97%	2.04%	3.06%	8.02%	12.03%
38	6.09%	9.14%	2.08%	3.12%	8.17%	12.26%
39	6.21%	9.32%	2.12%	3.18%	8.33%	12.50%

[1] Use these rates for non-integrated members .

Exhibit III: Member Contribution Rates (continued)

General Tier 1

	Basic		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
40	6.33%	9.50%	2.16%	3.24%	8.49%	12.74%
41	6.45%	9.68%	2.20%	3.30%	8.65%	12.98%
42	6.58%	9.87%	2.25%	3.37%	8.83%	13.24%
43	6.71%	10.06%	2.29%	3.44%	9.00%	13.50%
44	6.84%	10.26%	2.33%	3.50%	9.17%	13.76%
45	6.98%	10.47%	2.38%	3.57%	9.36%	14.04%
46	7.12%	10.68%	2.43%	3.65%	9.55%	14.33%
47	7.27%	10.90%	2.48%	3.72%	9.75%	14.62%
48	7.42%	11.13%	2.53%	3.80%	9.95%	14.93%
49	7.56%	11.34%	2.58%	3.87%	10.14%	15.21%
50	7.69%	11.54%	2.63%	3.94%	10.32%	15.48%
51	7.83%	11.74%	2.67%	4.01%	10.50%	15.75%
52	7.93%	11.90%	2.71%	4.06%	10.64%	15.96%
53	8.05%	12.07%	2.75%	4.12%	10.80%	16.19%
54	8.16%	12.25%	2.79%	4.18%	10.95%	16.43%
55	8.26%	12.38%	2.82%	4.23%	11.08%	16.61%
56	8.30%	12.45%	2.83%	4.25%	11.13%	16.70%
57	8.23%	12.35%	2.81%	4.22%	11.04%	16.57%
58	8.08%	12.13%	2.76%	4.14%	10.84%	16.27%
59 & Over	7.75%	11.63%	2.65%	3.97%	10.40%	15.60%

Interest: 7.00% per annum
COLA: 2.75%
Mortality: See *Section 4, Exhibit I*
Salary Increase: Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor: 34.14%
Additional Cashout: 7.50%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

General Tier 2 Members' Contribution Rates Based on the December 31, 2020 Actuarial Valuation (as a % of biweekly payroll)

General Tier 2

	Basic		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
16 & Under	3.08%	4.62%	0.79%	1.18%	3.87%	5.80%
17	3.14%	4.71%	0.80%	1.20%	3.94%	5.91%
18	3.20%	4.80%	0.82%	1.23%	4.02%	6.03%
19	3.26%	4.90%	0.83%	1.25%	4.09%	6.15%
20	3.33%	4.99%	0.85%	1.28%	4.18%	6.27%
21	3.39%	5.09%	0.87%	1.30%	4.26%	6.39%
22	3.46%	5.19%	0.89%	1.33%	4.35%	6.52%
23	3.53%	5.29%	0.90%	1.35%	4.43%	6.64%
24	3.60%	5.40%	0.92%	1.38%	4.52%	6.78%
25	3.67%	5.50%	0.94%	1.41%	4.61%	6.91%
26	3.74%	5.61%	0.95%	1.43%	4.69%	7.04%
27	3.81%	5.72%	0.97%	1.46%	4.78%	7.18%
28	3.88%	5.83%	0.99%	1.49%	4.87%	7.32%
29	3.96%	5.94%	1.01%	1.52%	4.97%	7.46%
30	4.03%	6.05%	1.03%	1.55%	5.06%	7.60%
31	4.11%	6.17%	1.05%	1.58%	5.16%	7.75%
32	4.19%	6.29%	1.07%	1.61%	5.26%	7.90%
33	4.27%	6.41%	1.09%	1.64%	5.36%	8.05%
34	4.35%	6.53%	1.11%	1.67%	5.46%	8.20%
35	4.44%	6.65%	1.13%	1.70%	5.57%	8.35%
36	4.52%	6.78%	1.15%	1.73%	5.67%	8.51%
37	4.61%	6.91%	1.18%	1.77%	5.79%	8.68%
38	4.69%	7.04%	1.20%	1.80%	5.89%	8.84%
39	4.78%	7.18%	1.22%	1.83%	6.00%	9.01%

[1] Use these rates for non-integrated members .

Exhibit III: Member Contribution Rates (continued)

General Tier 2						
	Basic		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
40	4.88%	7.31%	1.25%	1.87%	6.13%	9.18%
41	4.97%	7.45%	1.27%	1.91%	6.24%	9.36%
42	5.07%	7.60%	1.29%	1.94%	6.36%	9.54%
43	5.17%	7.75%	1.32%	1.98%	6.49%	9.73%
44	5.27%	7.90%	1.35%	2.02%	6.62%	9.92%
45	5.37%	8.06%	1.37%	2.06%	6.74%	10.12%
46	5.48%	8.22%	1.40%	2.10%	6.88%	10.32%
47	5.59%	8.38%	1.43%	2.14%	7.02%	10.52%
48	5.69%	8.54%	1.45%	2.18%	7.14%	10.72%
49	5.79%	8.68%	1.48%	2.22%	7.27%	10.90%
50	5.88%	8.82%	1.50%	2.25%	7.38%	11.07%
51	5.96%	8.94%	1.53%	2.29%	7.49%	11.23%
52	6.04%	9.06%	1.55%	2.32%	7.59%	11.38%
53	6.11%	9.17%	1.56%	2.34%	7.67%	11.51%
54	6.16%	9.24%	1.57%	2.36%	7.73%	11.60%
55	6.17%	9.25%	1.58%	2.37%	7.75%	11.62%
56	6.13%	9.20%	1.57%	2.35%	7.70%	11.55%
57	6.05%	9.08%	1.55%	2.32%	7.60%	11.40%
58	6.25%	9.38%	1.60%	2.40%	7.85%	11.78%
59 & Over	6.46%	9.69%	1.65%	2.48%	8.11%	12.17%

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	25.56%
Additional Cashout:	3.0%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

General Tier 3 Members' Contribution Rates Based on the December 31, 2020 Actuarial Valuation
(as a % of biweekly payroll)

	General Tier 3					
	Basic		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
16 & Under	4.64%	6.96%	2.03%	3.05%	6.67%	10.01%
17	4.73%	7.10%	2.07%	3.11%	6.80%	10.21%
18	4.82%	7.23%	2.11%	3.17%	6.93%	10.40%
19	4.92%	7.38%	2.16%	3.24%	7.08%	10.62%
20	5.01%	7.52%	2.20%	3.30%	7.21%	10.82%
21	5.11%	7.67%	2.24%	3.36%	7.35%	11.03%
22	5.21%	7.81%	2.29%	3.43%	7.50%	11.24%
23	5.31%	7.96%	2.33%	3.49%	7.64%	11.45%
24	5.41%	8.12%	2.37%	3.56%	7.78%	11.68%
25	5.52%	8.27%	2.42%	3.63%	7.94%	11.90%
26	5.62%	8.43%	2.47%	3.70%	8.09%	12.13%
27	5.73%	8.59%	2.51%	3.77%	8.24%	12.36%
28	5.84%	8.76%	2.56%	3.84%	8.40%	12.60%
29	5.95%	8.93%	2.61%	3.92%	8.56%	12.85%
30	6.07%	9.10%	2.66%	3.99%	8.73%	13.09%
31	6.18%	9.27%	2.71%	4.07%	8.89%	13.34%
32	6.30%	9.45%	2.76%	4.14%	9.06%	13.59%
33	6.42%	9.63%	2.81%	4.22%	9.23%	13.85%
34	6.54%	9.81%	2.87%	4.30%	9.41%	14.11%
35	6.67%	10.00%	2.93%	4.39%	9.60%	14.39%
36	6.80%	10.20%	2.98%	4.47%	9.78%	14.67%
37	6.93%	10.39%	3.04%	4.56%	9.97%	14.95%
38	7.07%	10.60%	3.10%	4.65%	10.17%	15.25%
39	7.20%	10.81%	3.16%	4.74%	10.36%	15.55%

[1] Use these rates for non-integrated members .

Exhibit III: Member Contribution Rates (continued)

General Tier 3

	Basic		COLA		Total	
Entry Age	**First $161**	**Over $161[1]**	**First $161**	**Over $161[1]**	**First $161**	**Over $161[1]**
40	7.35%	11.02%	3.22%	4.83%	10.57%	15.85%
41	7.50%	11.25%	3.29%	4.93%	10.79%	16.18%
42	7.65%	11.48%	3.35%	5.03%	11.00%	16.51%
43	7.82%	11.72%	3.43%	5.14%	11.25%	16.86%
44	7.96%	11.95%	3.49%	5.24%	11.45%	17.19%
45	8.10%	12.16%	3.55%	5.33%	11.65%	17.49%
46	8.25%	12.37%	3.62%	5.43%	11.87%	17.80%
47	8.36%	12.54%	3.67%	5.50%	12.03%	18.04%
48	8.48%	12.72%	3.72%	5.58%	12.20%	18.30%
49	8.60%	12.90%	3.77%	5.66%	12.37%	18.56%
50	8.70%	13.04%	3.81%	5.72%	12.51%	18.76%
51	8.74%	13.12%	3.83%	5.75%	12.57%	18.87%
52	8.67%	13.01%	3.81%	5.71%	12.48%	18.72%
53	8.51%	12.77%	3.73%	5.60%	12.24%	18.37%
54 & Over	8.17%	12.25%	3.58%	5.37%	11.75%	17.62%

Interest:	7.00% per annum
COLA:	2.75%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	43.86%
Additional Cashout:	7.5%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

General Tier 4 Members' Contribution Rates Based on the December 31, 2020 Actuarial Valuation (as a % of biweekly eligible payroll)[1]

	General Tier 4		
	Basic	COLA	Total
Entry Age	Eligible Pay	Eligible Pay	Eligible Pay
All Ages	7.47%	1.74%	9.21%

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	23.29%
Additional Cashout:	0.0%

1 It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2021 is equal to $128,059. (For an employer that is not enrolled in Social Security, the maximum amount is 120% of $128,059, or $153,671). (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2021. (reference: Section 7522.10(d))

Exhibit III: Member Contribution Rates (continued)

Safety Tier 1 Members' Contribution Rates Based on the December 31, 2020 Actuarial Valuation (as a % of biweekly payroll)

	Safety Tier 1							
	Basic		Cost Sharing Contributions		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
16 & Under	5.71%	8.56%	3.00%	3.00%	3.00%	4.50%	11.71%	16.06%
17	5.80%	8.71%	3.00%	3.00%	3.05%	4.57%	11.85%	16.28%
18	5.90%	8.85%	3.00%	3.00%	3.10%	4.65%	12.00%	16.50%
19	6.00%	9.00%	3.00%	3.00%	3.15%	4.73%	12.15%	16.73%
20	6.10%	9.15%	3.00%	3.00%	3.21%	4.81%	12.31%	16.96%
21	6.20%	9.30%	3.00%	3.00%	3.26%	4.89%	12.46%	17.19%
22	6.31%	9.46%	3.00%	3.00%	3.31%	4.97%	12.62%	17.43%
23	6.41%	9.62%	3.00%	3.00%	3.37%	5.05%	12.78%	17.67%
24	6.52%	9.78%	3.00%	3.00%	3.43%	5.14%	12.95%	17.92%
25	6.63%	9.94%	3.00%	3.00%	3.48%	5.22%	13.11%	18.16%
26	6.74%	10.11%	3.00%	3.00%	3.54%	5.31%	13.28%	18.42%
27	6.85%	10.28%	3.00%	3.00%	3.60%	5.40%	13.45%	18.68%
28	6.97%	10.46%	3.00%	3.00%	3.66%	5.49%	13.63%	18.95%
29	7.09%	10.63%	3.00%	3.00%	3.73%	5.59%	13.82%	19.22%
30	7.21%	10.81%	3.00%	3.00%	3.79%	5.68%	14.00%	19.49%
31	7.33%	11.00%	3.00%	3.00%	3.85%	5.78%	14.18%	19.78%
32	7.46%	11.19%	3.00%	3.00%	3.92%	5.88%	14.38%	20.07%
33	7.59%	11.38%	3.00%	3.00%	3.99%	5.98%	14.58%	20.36%
34	7.72%	11.59%	3.00%	3.00%	4.06%	6.09%	14.78%	20.68%
35	7.86%	11.79%	3.00%	3.00%	4.13%	6.20%	14.99%	20.99%
36	8.01%	12.01%	3.00%	3.00%	4.21%	6.31%	15.22%	21.32%
37	8.16%	12.24%	3.00%	3.00%	4.29%	6.43%	15.45%	21.67%
38	8.32%	12.47%	3.00%	3.00%	4.37%	6.55%	15.69%	22.02%
39	8.48%	12.73%	3.00%	3.00%	4.46%	6.69%	15.94%	22.42%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 1

	Basic		Cost Sharing Contributions		COLA		Total	
Entry Age	**First $161**	**Over $161[1]**	**First $161**	**Over $161[1]**	**First $161**	**Over $161[1]**	**First $161**	**Over $161[1]**
40	8.66%	12.98%	3.00%	3.00%	4.55%	6.82%	16.21%	22.80%
41	8.84%	13.27%	3.00%	3.00%	4.65%	6.97%	16.49%	23.24%
42	9.03%	13.54%	3.00%	3.00%	4.74%	7.11%	16.77%	23.65%
43	9.22%	13.84%	3.00%	3.00%	4.85%	7.27%	17.07%	24.11%
44	9.39%	14.08%	3.00%	3.00%	4.93%	7.40%	17.32%	24.48%
45	9.45%	14.18%	3.00%	3.00%	4.97%	7.45%	17.42%	24.63%
46	9.45%	14.17%	3.00%	3.00%	4.97%	7.45%	17.42%	24.62%
47	9.21%	13.82%	3.00%	3.00%	4.84%	7.26%	17.05%	24.08%
48	8.93%	13.40%	3.00%	3.00%	4.69%	7.04%	16.62%	23.44%
49 & Over	8.46%	12.69%	3.00%	3.00%	4.45%	6.67%	15.91%	22.36%

Interest:	7.00% per annum
COLA:	2.75%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	52.54%
Additional Cashout:	7.5%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 2 Members' Contribution Rates Based on the December 31, 2020 Actuarial Valuation
(as a % of biweekly payroll)

	Safety Tier 2							
	Basic		Cost Sharing Contributions		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
16 & Under	5.23%	7.85%	3.00%	3.00%	2.30%	3.45%	10.53%	14.30%
17	5.32%	7.98%	3.00%	3.00%	2.34%	3.51%	10.66%	14.49%
18	5.41%	8.12%	3.00%	3.00%	2.38%	3.57%	10.79%	14.69%
19	5.50%	8.25%	3.00%	3.00%	2.42%	3.63%	10.92%	14.88%
20	5.59%	8.39%	3.00%	3.00%	2.46%	3.69%	11.05%	15.08%
21	5.69%	8.53%	3.00%	3.00%	2.50%	3.75%	11.19%	15.28%
22	5.78%	8.67%	3.00%	3.00%	2.54%	3.81%	11.32%	15.48%
23	5.88%	8.82%	3.00%	3.00%	2.59%	3.88%	11.47%	15.70%
24	5.98%	8.97%	3.00%	3.00%	2.63%	3.94%	11.61%	15.91%
25	6.08%	9.12%	3.00%	3.00%	2.67%	4.01%	11.75%	16.13%
26	6.18%	9.27%	3.00%	3.00%	2.72%	4.08%	11.90%	16.35%
27	6.28%	9.43%	3.00%	3.00%	2.76%	4.14%	12.04%	16.57%
28	6.39%	9.59%	3.00%	3.00%	2.81%	4.21%	12.20%	16.80%
29	6.50%	9.75%	3.00%	3.00%	2.85%	4.28%	12.35%	17.03%
30	6.61%	9.91%	3.00%	3.00%	2.91%	4.36%	12.52%	17.27%
31	6.72%	10.08%	3.00%	3.00%	2.95%	4.43%	12.67%	17.51%
32	6.84%	10.26%	3.00%	3.00%	3.01%	4.51%	12.85%	17.77%
33	6.96%	10.44%	3.00%	3.00%	3.06%	4.59%	13.02%	18.03%
34	7.08%	10.62%	3.00%	3.00%	3.11%	4.67%	13.19%	18.29%
35	7.21%	10.81%	3.00%	3.00%	3.17%	4.75%	13.38%	18.56%
36	7.34%	11.01%	3.00%	3.00%	3.23%	4.84%	13.57%	18.85%
37	7.48%	11.22%	3.00%	3.00%	3.29%	4.93%	13.77%	19.15%
38	7.62%	11.43%	3.00%	3.00%	3.35%	5.03%	13.97%	19.46%
39	7.77%	11.66%	3.00%	3.00%	3.41%	5.12%	14.18%	19.78%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 2								
	Basic		Cost Sharing Contributions		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
40	7.92%	11.88%	3.00%	3.00%	3.48%	5.22%	14.40%	20.10%
41	8.07%	12.11%	3.00%	3.00%	3.55%	5.32%	14.62%	20.43%
42	8.22%	12.32%	3.00%	3.00%	3.61%	5.42%	14.83%	20.74%
43	8.32%	12.47%	3.00%	3.00%	3.65%	5.48%	14.97%	20.95%
44	8.35%	12.53%	3.00%	3.00%	3.67%	5.51%	15.02%	21.04%
45	8.28%	12.42%	3.00%	3.00%	3.64%	5.46%	14.92%	20.88%
46	8.13%	12.20%	3.00%	3.00%	3.57%	5.36%	14.70%	20.56%
47	7.94%	11.90%	3.00%	3.00%	3.49%	5.23%	14.43%	20.13%
48	8.19%	12.29%	3.00%	3.00%	3.60%	5.40%	14.79%	20.69%
49 & Over	8.46%	12.69%	3.00%	3.00%	3.72%	5.58%	15.18%	21.27%

Interest: 7.00% per annum
COLA: 2.00%
Mortality: See *Section 4, Exhibit I*
Salary Increase: Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor: 43.96%
Additional Cashout: 2.5%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 2C Members' Contribution Rates Based on the December 31, 2020 Actuarial Valuation (as a % of biweekly payroll)

Safety Tier 2C						
	Basic		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
16 & Under	5.23%	7.85%	2.08%	3.12%	7.31%	10.97%
17	5.32%	7.98%	2.11%	3.17%	7.43%	11.15%
18	5.41%	8.12%	2.15%	3.22%	7.56%	11.34%
19	5.50%	8.25%	2.19%	3.28%	7.69%	11.53%
20	5.59%	8.39%	2.22%	3.33%	7.81%	11.72%
21	5.69%	8.53%	2.26%	3.39%	7.95%	11.92%
22	5.78%	8.67%	2.30%	3.45%	8.08%	12.12%
23	5.88%	8.82%	2.33%	3.50%	8.21%	12.32%
24	5.98%	8.97%	2.37%	3.56%	8.35%	12.53%
25	6.08%	9.12%	2.41%	3.62%	8.49%	12.74%
26	6.18%	9.27%	2.45%	3.68%	8.63%	12.95%
27	6.28%	9.43%	2.49%	3.74%	8.77%	13.17%
28	6.39%	9.59%	2.54%	3.81%	8.93%	13.40%
29	6.50%	9.75%	2.58%	3.87%	9.08%	13.62%
30	6.61%	9.91%	2.63%	3.94%	9.24%	13.85%
31	6.72%	10.08%	2.67%	4.01%	9.39%	14.09%
32	6.84%	10.26%	2.72%	4.08%	9.56%	14.34%
33	6.96%	10.44%	2.77%	4.15%	9.73%	14.59%
34	7.08%	10.62%	2.81%	4.22%	9.89%	14.84%
35	7.21%	10.81%	2.87%	4.30%	10.08%	15.11%
36	7.34%	11.01%	2.91%	4.37%	10.25%	15.38%
37	7.48%	11.22%	2.97%	4.46%	10.45%	15.68%
38	7.62%	11.43%	3.03%	4.54%	10.65%	15.97%
39	7.77%	11.66%	3.09%	4.63%	10.86%	16.29%

[1] Use these rates for non-integrated members .

Exhibit III: Member Contribution Rates (continued)

Safety Tier 2C						
	Basic		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
40	7.92%	11.88%	3.15%	4.72%	11.07%	16.60%
41	8.07%	12.11%	3.21%	4.81%	11.28%	16.92%
42	8.22%	12.32%	3.27%	4.90%	11.49%	17.22%
43	8.32%	12.47%	3.31%	4.96%	11.63%	17.43%
44	8.35%	12.53%	3.32%	4.98%	11.67%	17.51%
45	8.28%	12.42%	3.29%	4.94%	11.57%	17.36%
46	8.13%	12.20%	3.23%	4.85%	11.36%	17.05%
47	7.94%	11.90%	3.15%	4.73%	11.09%	16.63%
48	8.19%	12.29%	3.25%	4.88%	11.44%	17.17%
49 & Over	8.46%	12.69%	3.36%	5.04%	11.82%	17.73%

Interest: 7.00% per annum
COLA: 2.00%
Mortality: See *Section 4, Exhibit I*
Salary Increase: Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor: 39.73%
Additional Cashout: 2.5%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 2D Members' Contribution Rates for Members with Less than 5 Years of Vesting Service Based on the December 31, 2020 Actuarial Valuation (as a % of biweekly payroll)

Safety Tier 2D Members with Less than 5 Years of Vesting Service

	Basic		Cost Sharing Contributions		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
16 & Under	5.23%	7.85%	5.00%	5.00%	2.25%	3.37%	12.48%	16.22%
17	5.32%	7.98%	5.00%	5.00%	2.29%	3.43%	12.61%	16.41%
18	5.41%	8.12%	5.00%	5.00%	2.33%	3.49%	12.74%	16.61%
19	5.50%	8.25%	5.00%	5.00%	2.37%	3.55%	12.87%	16.80%
20	5.59%	8.39%	5.00%	5.00%	2.41%	3.61%	13.00%	17.00%
21	5.69%	8.53%	5.00%	5.00%	2.45%	3.67%	13.14%	17.20%
22	5.78%	8.67%	5.00%	5.00%	2.49%	3.73%	13.27%	17.40%
23	5.88%	8.82%	5.00%	5.00%	2.53%	3.79%	13.41%	17.61%
24	5.98%	8.97%	5.00%	5.00%	2.57%	3.85%	13.55%	17.82%
25	6.08%	9.12%	5.00%	5.00%	2.61%	3.92%	13.69%	18.04%
26	6.18%	9.27%	5.00%	5.00%	2.66%	3.99%	13.84%	18.26%
27	6.28%	9.43%	5.00%	5.00%	2.70%	4.05%	13.98%	18.48%
28	6.39%	9.59%	5.00%	5.00%	2.75%	4.12%	14.14%	18.71%
29	6.50%	9.75%	5.00%	5.00%	2.79%	4.19%	14.29%	18.94%
30	6.61%	9.91%	5.00%	5.00%	2.84%	4.26%	14.45%	19.17%
31	6.72%	10.08%	5.00%	5.00%	2.89%	4.33%	14.61%	19.41%
32	6.84%	10.26%	5.00%	5.00%	2.94%	4.41%	14.78%	19.67%
33	6.96%	10.44%	5.00%	5.00%	2.99%	4.49%	14.95%	19.93%
34	7.08%	10.62%	5.00%	5.00%	3.05%	4.57%	15.13%	20.19%
35	7.21%	10.81%	5.00%	5.00%	3.10%	4.65%	15.31%	20.46%
36	7.34%	11.01%	5.00%	5.00%	3.15%	4.73%	15.49%	20.74%
37	7.48%	11.22%	5.00%	5.00%	3.21%	4.82%	15.69%	21.04%
38	7.62%	11.43%	5.00%	5.00%	3.27%	4.91%	15.89%	21.34%
39	7.77%	11.66%	5.00%	5.00%	3.34%	5.01%	16.11%	21.67%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 2D Members with Less than 5 Years of Vesting Service

	Basic		Cost Sharing Contributions		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
40	7.92%	11.88%	5.00%	5.00%	3.41%	5.11%	16.33%	21.99%
41	8.07%	12.11%	5.00%	5.00%	3.47%	5.21%	16.54%	22.32%
42	8.22%	12.32%	5.00%	5.00%	3.53%	5.30%	16.75%	22.62%
43	8.32%	12.47%	5.00%	5.00%	3.57%	5.36%	16.89%	22.83%
44	8.35%	12.53%	5.00%	5.00%	3.59%	5.39%	16.94%	22.92%
45	8.28%	12.42%	5.00%	5.00%	3.56%	5.34%	16.84%	22.76%
46	8.13%	12.20%	5.00%	5.00%	3.50%	5.25%	16.63%	22.45%
47	7.94%	11.90%	5.00%	5.00%	3.41%	5.12%	16.35%	22.02%
48	8.19%	12.29%	5.00%	5.00%	3.52%	5.28%	16.71%	22.57%
49 & Over	8.46%	12.69%	5.00%	5.00%	3.64%	5.46%	17.10%	23.15%

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	42.99%
Additional Cashout:	2.5%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 2D Members with 5 or More Years of Vesting Service
Based on the December 31, 2020 Actuarial Valuation (as a % of biweekly payroll)

Safety Tier 2D Members with 5 or More Years of Vesting Service

	Basic		Cost Sharing Contributions		COLA		Total	
Entry Age	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]	First $161	Over $161[1]
16 & Under	5.23%	7.85%	3.00%	3.00%	2.25%	3.37%	10.48%	14.22%
17	5.32%	7.98%	3.00%	3.00%	2.29%	3.43%	10.61%	14.41%
18	5.41%	8.12%	3.00%	3.00%	2.33%	3.49%	10.74%	14.61%
19	5.50%	8.25%	3.00%	3.00%	2.37%	3.55%	10.87%	14.80%
20	5.59%	8.39%	3.00%	3.00%	2.41%	3.61%	11.00%	15.00%
21	5.69%	8.53%	3.00%	3.00%	2.45%	3.67%	11.14%	15.20%
22	5.78%	8.67%	3.00%	3.00%	2.49%	3.73%	11.27%	15.40%
23	5.88%	8.82%	3.00%	3.00%	2.53%	3.79%	11.41%	15.61%
24	5.98%	8.97%	3.00%	3.00%	2.57%	3.85%	11.55%	15.82%
25	6.08%	9.12%	3.00%	3.00%	2.61%	3.92%	11.69%	16.04%
26	6.18%	9.27%	3.00%	3.00%	2.66%	3.99%	11.84%	16.26%
27	6.28%	9.43%	3.00%	3.00%	2.70%	4.05%	11.98%	16.48%
28	6.39%	9.59%	3.00%	3.00%	2.75%	4.12%	12.14%	16.71%
29	6.50%	9.75%	3.00%	3.00%	2.79%	4.19%	12.29%	16.94%
30	6.61%	9.91%	3.00%	3.00%	2.84%	4.26%	12.45%	17.17%
31	6.72%	10.08%	3.00%	3.00%	2.89%	4.33%	12.61%	17.41%
32	6.84%	10.26%	3.00%	3.00%	2.94%	4.41%	12.78%	17.67%
33	6.96%	10.44%	3.00%	3.00%	2.99%	4.49%	12.95%	17.93%
34	7.08%	10.62%	3.00%	3.00%	3.05%	4.57%	13.13%	18.19%
35	7.21%	10.81%	3.00%	3.00%	3.10%	4.65%	13.31%	18.46%
36	7.34%	11.01%	3.00%	3.00%	3.15%	4.73%	13.49%	18.74%
37	7.48%	11.22%	3.00%	3.00%	3.21%	4.82%	13.69%	19.04%
38	7.62%	11.43%	3.00%	3.00%	3.27%	4.91%	13.89%	19.34%
39	7.77%	11.66%	3.00%	3.00%	3.34%	5.01%	14.11%	19.67%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 2D Members with 5 or More Years of Vesting Service

	Basic		Cost Sharing Contributions		COLA		Total	
Entry Age	**First $161**	**Over $161[1]**	**First $161**	**Over $161[1]**	**First $161**	**Over $161[1]**	**First $161**	**Over $161[1]**
40	7.92%	11.88%	3.00%	3.00%	3.41%	5.11%	14.33%	19.99%
41	8.07%	12.11%	3.00%	3.00%	3.47%	5.21%	14.54%	20.32%
42	8.22%	12.32%	3.00%	3.00%	3.53%	5.30%	14.75%	20.62%
43	8.32%	12.47%	3.00%	3.00%	3.57%	5.36%	14.89%	20.83%
44	8.35%	12.53%	3.00%	3.00%	3.59%	5.39%	14.94%	20.92%
45	8.28%	12.42%	3.00%	3.00%	3.56%	5.34%	14.84%	20.76%
46	8.13%	12.20%	3.00%	3.00%	3.50%	5.25%	14.63%	20.45%
47	7.94%	11.90%	3.00%	3.00%	3.41%	5.12%	14.35%	20.02%
48	8.19%	12.29%	3.00%	3.00%	3.52%	5.28%	14.71%	20.57%
49 & Over	8.46%	12.69%	3.00%	3.00%	3.64%	5.46%	15.10%	21.15%

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	42.99%
Additional Cashout:	2.5%

[1] Use these rates for non-integrated members.

Exhibit III: Member Contribution Rates (continued)

Safety Tier 4 Members' Contribution Rates Based on the December 31, 2020 Actuarial Valuation (as a % of biweekly eligible payroll)[1]

	Safety Tier 4		
	Basic	COLA	Total
Entry Age	Eligible Pay	Eligible Pay	Eligible Pay
All Ages	13.19%	3.74%	16.93%

Interest:	7.00% per annum
COLA:	2.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (2.75%) + Across-the-Board Increase (0.50%) + Merit (See *Section 4, Exhibit I*)
COLA Loading Factor:	28.35%
Additional Cashout:	0.0%

[1] It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2021 is equal to $128,059. (For an employer that is not enrolled in Social Security, the maximum amount is 120% of $128,059, or $153,671). (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2021. (reference: Section 7522.10(d))

Exhibit IV: Projected Employer Contributions by Each Participating Employer

Estimated Employer Contribution Requirement for Each Participating Employer in ACERA ($000s) Calculated Based on Projected Employer Compensation Used in the December 31, 2020 Actuarial Valuation

Dollar Contribution[1,3] – Based on December 31, 2020 Valuation

	General				Safety					
Employer Name (Code)	**Tier 1**	**Tier 2**	**Tier 3**	**Tier 4**	**Tier 1**	**Tier 2**	**Tier 2C**	**Tier 2D**	**Tier 4**	**Total**
Alameda County (101)	$1,584	$91,282		$58,520	$436	$75,923	$2,133	$11,566	$33,441	$274,885
Health System (106)	109	35,310		31,602						67,021
Superior Court (632)	201	8,876		5,622						14,699
First 5 (714)		674		1,001						1,675
Housing Authority (103)	970	74		507						1,551
LARPD (104)	231		$851	570						1,652
Total	**$3,095**	**$136,216**	**$851**	**$97,822**	**$436**	**$75,923**	**$2,133**	**$11,566**	**$33,441**	**$361,483**

Dollar Contribution[2,3] – Based on December 31, 2019 Valuation

	General				Safety					
Employer Name (Code)	**Tier 1**	**Tier 2**	**Tier 3**	**Tier 4**	**Tier 1**	**Tier 2**	**Tier 2C**	**Tier 2D**	**Tier 4**	**Total**
Alameda County (101)	$1,420	$83,197		$52,716	$408	$69,896	$1,875	$10,486	$30,410	$250,408
Health System (106)	98	32,203		28,496						60,797
Superior Court (632)	180	8,095		5,070						13,345
First 5 (714)		614		903						1,517
Housing Authority (103)	887	69		466						1,422
LARPD (104)	204		$777	506						1,487
Total	**$2,789**	**$124,178**	**$777**	**$88,157**	**$408**	**$69,896**	**$1,875**	**$10,486**	**$30,410**	**$328,976**

[1] Includes contributions only for those employers with active member payroll. The UAAL contribution for ACOE, expressed as a level dollar amount, is $100 K when made on April 1, 2022.

[2] Includes contributions only for those employers with active member payroll. The UAAL contribution for ACOE, expressed as a level dollar amount, is $89 K when made on April 1, 2021.

[3] Contribution calculated using projected compensation provided on the next page for the December 31, 2020 valuation:

Exhibit IV: Projected Employer Contributions by Each Participating Employer (continued)

	December 31, 2020 Projected Total Compensation ($000s)									
	General				Safety					
Employer Name (Code)	Tier 1	Tier 2	Tier 3	Tier 4	Tier 1	Tier 2	Tier 2C	Tier 2D	Tier 4	Total
Alameda County (101)	$6,200	$379,552		$245,987	$491	$109,794	$2,887	$16,563	$50,272	$811,746
Health System (106)	412	141,301		127,789						269,502
Superior Court (632)	758	35,518		22,734						59,010
First 5 (714)		2,696		4,048						6,744
Housing Authority (103)	3,061	248		1,692						5,001
LARPD (104)	537		$1,773	1,384						3,694
Total	**$10,968**	**$559,315**	**$1,773**	**$403,634**	**$491**	**$109,794**	**$2,887**	**$16,563**	**$50,272**	**$1,155,697**

Exhibit V: Schedule of Outstanding Balances of Prior Implicit Retiree Health Benefit Subsidy Transfers

For Year(s)	Initial Years	Initial Amount[1]	Outstanding Balance	Years Remaining	Annual Payment[2]
Prior to 2013	[3]	[3]	$32,661	12	$3,402
2013	20	$6,993	6,396	13	626
2014	20	5,215	4,828	14	445
2015	20	5,325	5,102	15	447
2016	20	8,865	8,615	16	719
2017	20	5,830	5,644	17	450
2018	20	6,940	6,881	18	527
2019	20	6,511	6,485	19	478
2020	20	7,549	7,549	20	537
Total			**$84,161**		**7,631**

[1] For years 2013 and later, these amounts are estimates provided by ACERA.
[2] Level percentage of payroll.
[3] Various initial years and amounts prior to 2013.

Exhibit VI: Allocation of the Valuation Value of Assets as of December 31, 2020

The allocation of the Valuation Value of Assets is determined based on a roll-forward of the prior year allocation using employer contributions, member contributions, benefit payments, and calculated interest credits as provided by ACERA.

	General (Excluding LARPD and Office of Education)	General (Office of Education)	General (LARPD)	Safety	Total
A. Valuation Value of Assets at Beginning-of-Year					
Basic Only	$3,971,955,371	$2,372,818	$30,691,377	$1,159,531,417	$5,164,550,983
COLA Only	1,704,853,157	1,335,172	16,119,166	713,117,639	2,435,425,134
Total	$5,676,808,528	$3,707,990	$46,810,543	$1,872,649,056	$7,599,976,117
B. Adjustment for the difference between the Actual SRBR Transfer and the Estimated SRBR Transfer used in Prior Valuation					
Basic Only	$(49,804)	$0	$0	$(14,370)	$(64,174)
C. Employer Contributions					
Basic Only	$156,348,782	$72,051	$1,042,789	$85,215,088	$242,678,710
COLA Only	42,702,958	0	448,128	23,923,202	67,074,288
Total	$199,051,739	$72,051	$1,490,917	$109,138,290	$309,752,998
D. Employee Contributions					
Basic Only	$62,927,561	$0	$367,840	$21,963,634	$85,259,035
COLA Only	14,343,066	0	120,842	6,381,283	20,845,191
Total	$77,270,627	$0	$488,682	$28,344,917	$106,104,226
E. Benefit Payments					
Basic Only	$289,277,085	$275,102	$2,497,889	$106,622,969	$398,673,046
COLA Only	92,412,141	121,889	645,160	37,563,830	130,743,020
Total	$381,689,226	$396,992	$3,143,049	$144,186,800	$529,416,066
F. Average Valuation Value of Assets: (A) + (B) +1/2 x [(C) + (D) - (E)]					
Basic Only	$3,936,905,196	$2,271,292	$30,147,747	$1,159,794,923	$5,129,119,159
COLA Only	1,687,170,098	1,274,227	16,081,071	709,487,966	2,414,013,363
Total	$5,624,075,294	$3,545,520	$46,228,818	$1,869,282,889	$7,543,132,522
G. Return on Valuation Value of Assets: Total Column (G) / Total Column (F) x Cost Group Column (F)					
Basic Only	$255,837,764	$147,599	$1,959,136	$75,368,678	$333,313,176
COLA Only	109,746,002	82,885	1,046,032	46,150,336	157,025,255
Total	$365,583,765	$230,484	$3,005,167	$121,519,014	$490,338,431
H. Preliminary Valuation Value of Assets Provided by ACERA: (A) + (B) + (C) + (D) – (E) + (G)					
Basic Only	$4,157,742,589	$2,317,366	$31,563,253	$1,235,441,477	$5,427,064,685
COLA Only	1,779,233,041	1,296,168	17,089,008	752,008,630	2,549,626,847
Total	$5,936,975,630	$3,613,534	$48,652,261	$1,987,450,107	$7,976,691,532
I. Estimated SRBR Transfer and other Asset Transfer					
Basic Only	$5,874,747	$0	$0	$1,673,936	$7,548,683
COLA Only	0	0	0	0	0
Total	$5,874,747	$0	$0	$1,673,936	$7,548,683
J. Valuation Value of Assets at End of Year: (H) + (I)					
Basic Only	**$4,163,617,336**	**$2,317,366**	**$31,563,253**	**$1,237,115,413**	**$5,434,613,368**
COLA Only	**1,779,233,041**	**1,296,168**	**17,089,008**	**752,008,630**	**2,549,626,847**
Total	**$5,942,850,377**	**$3,613,534**	**$48,652,261**	**$1,989,124,043**	**$7,984,240,215**

Note: Results may be slightly off due to rounding.

ACERA

Office of the Chief Counsel

To: Actuarial Committee

From: Jeff Rieger, Chief Counsel

Meeting: May 20, 2021

Subject: **Proposed Revisions to Actuarial Funding Policy and Interest Crediting Policy**

Introduction

The County may contribute approximately $800 million to ACERA on or before June 30, 2021, to pay off a substantial portion of the County's UAAL associated with its former and current Safety employees. This payment will be subject to the Board of Retirement's and Board of Supervisor's approval of an agreement, which we expect to bring to the Board of Retirement at its June 17, 2021 meeting.

The proposed revisions to the Actuarial Funding Policy and Interest Crediting Policy are shown in the attached redlines. The proposed revisions are designed to ensure that (a) the County receives full credit for its contribution, and (b) ACERA's other participating employers and the SRBR are not negatively impacted by the contribution. Because the County is the only participating employer with Safety members, Staff and the Actuary (Segal) believe that the revisions to the policies described below are adequate.[1]

Proposed Revisions

Deferred Gains and Losses

ACERA defers recognition of investment gains and losses over a five-year period. For example, as of December 31, 2020, ACERA has $643.3 million of deferred gains, and likely will still have substantial deferred gains on June 30, 2021. If the County deposits $800 million on June 30, 2021, those funds will not have participated in earning the deferred gains as of that date. Thus, that extraordinary contribution should not be credited with interest associated with those deferred gains, at the expense of the other employers and the SRBR.

The proposed revisions to the Policies resolve this issue by establishing a new reserve—the County Safety Voluntary Contribution Reserve ("Reserve")—to hold the County's extraordinary contribution. Amounts in that Reserve will be periodically transferred to the

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1 ACERA can accept extraordinary contributions to pay off UAAL associated with General members in an equitable manner, but additional policy adjustments would be required because the County is pooled with other employers of General members for the purposes of determining employer contributions.

Employer Advance Reserve and COLA Reserve to offset a portion of the County's Safety UAAL contribution that would otherwise be required of the County and deposited in those reserves. For five years, the amounts in the Reserve will be credited with interest based on a separate five year cycle of deferred investment gains and losses that does not include any of the deferred gains and losses that existed before the County's contribution. After that first five years, amounts remaining in the Reserve that are attributable to the County's extraordinary contribution would be credited with the same interest as the other valuation reserves. Interest will be credited to the Reserve using the weighted outstanding balance of the Reserve after taking into consideration the periodic transfers from the Reserve. In this manner, all employers and the SRBR will receive their fair share of deferred investment gains and losses that existed before the County's extraordinary contribution.

Contingency Reserve

ACERA maintains a non-valuation Contingency Reserve with 1% of the system's assets. The Contingency Reserve is filled up in years when the actuarially recognized returns exceed expected returns and amounts will continue to accumulate in that Reserve for as long as actuarially recognized returns are at or above expected returns. In years when the actuarially recognized returns fall short of expected returns, funds in the Contingency Reserve are transferred to valuation reserves and the SRBR. As of December 31, 2020, the Contingency Reserve held approximately $69 million and is expected to hold more than that on June 30, 2021. The County's extraordinary contribution will not have earned any of the excess returns held in the Contingency Reserve at the time the County makes its extraordinary contribution. Thus, under the proposed revisions to the Interest Crediting Policy, if the funds in the Contingency Reserve will be transferred to valuation reserves and SRBR, the Board may consider whether any adjustments to its normal procedures are advisable for the equitable treatment of all participating employers and the SRBR.

Conclusion

The recommended policy revisions are squarely within the Board's constitutional and statutory authority regarding actuarial matters. *See* Cal. Const., art. XVI § 17(e); Gov't Code § 31454.7 (Legislature affirming, in 2020, the Board's "plenary authority to recommend adjustments to county and district contributions as necessary to ensure the appropriate funding of the system"). The County's payment of the contribution discussed in this memorandum will be subject to the Board of Retirement's and Board of Supervisor's approval of an agreement that we expect to bring to the Board of Retirement at its June 17, 2021 meeting. ACERA will also bring back at that meeting the County's Safety employer contribution rates for 2021/2022 recommended by Segal to reflect the final amount of the County's extraordinary contribution (if it is made). *See Bandt v. Board of Retirement* (2006) 136 Cal.App.4th 140 (interim valuation to account for extraordinary contribution was appropriate). Further, to the extent additional revisions to the Actuarial Funding Policy and Interest Crediting Policy may be necessary to implement the terms of such an agreement, we will return to the Committee or Board with such further revisions, but Staff and the Actuary believe that the currently proposed revisions will establish the framework for ACERA to accept the contemplated contribution in an equitable manner.

Andy Yeung and I will be available at the Committee meeting to answer any questions.

Interest Crediting Policy

I. Purpose

The purpose of this policy is to establish the process to be used by the Alameda County Employees' Retirement Association ("ACERA") to credit semi-annual interest to reserves. This policy shall include, but may not be limited to, the following:

A. Defining the reserves maintained by ACERA;

B. Determining the regular and excess rates of interest at which reserves are to be credited; and

C. Determining the priorities and sequence by which interest will be credited to the reserves.

II. Objectives

The policy has been developed with the following objectives:

A. To comply with appropriate legal and regulatory requirements.

B. To maintain consistency between the reserving structure and the actuarial funding of ACERA.

C. To limit, to the extent possible, the volatility of interest crediting from period to period.

D. To limit, to the extent possible, the charging of losses to valuation reserves.

E. To assure that the reserve values track the market value of assets over the long term.

III. Governing Law

ACERA is governed by provisions of the County Employees Retirement Law of 1937 ("CERL"), as well as other federal and State laws relating to public retirement systems.

CERL generally governs interest crediting and excess earnings. Under CERL, interest is credited ~~every~~on June 30 and December 31 each year to all contributions, reserves, and accounts in the retirement fund which have been on deposit for 6 months. Various reserves and designations are established and maintained by the Board under procedures adopted by the Board pursuant to Article 5.5 of CERL.

IV. Reserves

ACERA maintains the following reserves:

A. Valuation Reserves

1. Member Deposit Basic and Cost-of-Living Reserves – The reserves to which member contributions are credited. These contributions may be refunded to the member upon separation from service or left on deposit by the member upon separation from service (deferred retirement). Upon retirement of a member, transfers are made to Annuity and Cost-of-Living Reserves.

2. Employer Advance (Basic) Reserve – The reserve to which basic employer contributions are credited, including amounts made directly to the retirement plan as well as amounts made to the 401(h) Reserve Account for payment of estimated retiree health benefits (OPEB) for the next fiscal year but reimbursed with a transfer from the SRBR. Upon retirement of a member, a transfer is made to Pension (Current and Prior) Reserves (Pension).

3. Cost-of-Living Reserve – The reserve to which cost-of-living employer contributions are credited and Member Cost-of-Living contributions for new retirees are transferred when the member retires.

4. Retired Member Reserves (Annuity & Pension) – The reserves to which transfers are made from Member Deposit Basic and Employer Advance (Basic) Reserve at the time of a member's retirement. The total of these reserves should equal the present value of the total benefits (excluding cost-of-living increases) due all retirees and eligible beneficiaries had there been no actuarial gains or losses and changes in actuarial assumptions.

5. Survivor Death Benefit Reserve – The reserve is credited with the present value of death and survivor benefits expected to be paid upon the death of an active member.

6. County Safety Voluntary Contribution Reserve – The reserve to which the County's voluntary contributions to pay Unfunded Actuarial Accrued Liability (UAAL) associated with the County's past and present Safety employees are credited. Pursuant to the Board's Actuarial Funding Policy, the County Safety Voluntary Contribution Reserve will be subject to a separate five-year asset smoothing schedule that excludes any known deferred investment gains or losses carried over from periods before the County makes a voluntary contribution. Five years after the County makes any such contribution, the same five-year asset smoothing schedule that is used to calculate interest for the other valuation reserves will then be used for amounts in the County Safety Voluntary Contribution Reserve that are attributable to such contribution.

B. Non-Valuation Reserves

1. Contingency Reserve Account – The reserve is maintained in an amount equal to 1% of the total market value of assets to provide funds to offset future deficiencies in interest earnings, losses on investment or other contingencies. This reserve consists of the minimum 1% required pursuant to Section 31616. If the Contingency Reserve is negative, then it will be included as an offset to the valuation value of assets used to determine the employers' contribution rates in the annual actuarial valuation. The Board may transfer funds from the Contingency Reserve to different valuation reserves at different rates (including no transfer at all to one or more valuation reserves) in order to take account of the timing of extraordinary employer contributions to ACERA in a manner that is equitable to all employers and the SRBR.

2. 401(h) Reserve Account – The reserve is credited with employer contributions in an amount sufficient for payment of estimated retiree health benefits (OPEB) for the next fiscal year. Once the employers make the contributions to this Account, there will be a reimbursement to the Employer Advance Reserve through a transfer from the SRBR.

3. Supplemental Retiree Benefit Reserve (SRBR) – This reserve is used for the payment of benefits provided to members who are retired or beneficiaries as determined by the Board in accordance with Section 31618 of the CERL. For book-keeping purposes only, the SRBR Reserve is divided into two parts:

    a. OPEB Reserve – This reserve is used to fund discretionary retiree health benefits.

    b. Non-OPEB Reserve – This reserve is used to fund discretionary supplemental COLA benefits and to fund vested $1,000 lump sum death benefits.

C. Financial Statement Reserves and Accounts

Market Stabilization Reserve – The difference between the current market value of assets and the actuarial value of assets used to establish the above reserves.

V. Guidelines

A. “Available Earnings” are determined on current period earnings of the fund calculated on the actuarial value of assets as determined under the Board’s funding policy, plus any positive balance in the Contingency Reserve.

B. Credit regular interest at the assumed annual valuation interest rate on the valuation reserves, the 401(h) Reserve Account and the SRBR. Earnings will be credited twice each year to all reserves that have been on deposit for six full months, in accordance with Section 31615 of the CERL. The crediting of interest will take effect on June 30 and December 31 of each year.

C. Maintain a 1% Contingency Reserve Account required pursuant to Section 31616. (It should be noted that an additional amount up to 2% may be included at the discretion of the Board as permitted by Section 31616. The Board’s current policy is not to include any such additional discretionary amount.)

D. Any Available Earnings remaining after crediting full interest to valuation reserves, the 401(h) Reserve Account, the SRBR, and restoring the Contingency Reserve Account to its target level constitute Excess Earnings. The Excess Earnings will be allocated in the following manner:

1. Allocate one-half to the Unallocated SRBR.

2. Allocate the other one-half of the remaining earnings to the valuation reserves and the 401(h) Reserve Account in proportion to the amounts in each of those reserves.

E. The Glossary of terms is attached as Exhibit A.

VI. Regular Interest Crediting Process

Step 1 Determine "Available Earnings" for accounting period as the sum of:

A. Earnings of the retirement fund for the period based on actuarial value of assets, expressed in dollars. This could be a negative amount.

B. Any positive balance in the Contingency Reserve Account.

C. If sum of A. and B. is negative, such negative amount is credited only to the Contingency Reserve Account but not to the valuation reserves, the 401(h) Reserve Account or the SRBR.

Step 2 Credit interest to the valuation reserves, the 401(h) Reserve Account, and the SRBR

A. If in the prior accounting period the Contingency Reserve Account was reduced below 1% to meet the interest crediting requirements under Step 2 in the prior period, transfer Available Earnings from the current period into the Contingency Reserve Account to restore it to 1% of total assets.

B. Credit the valuation reserves, the 401(h) Reserve Account and the SRBR at a rate up to one-half of the assumed annual valuation interest rate, if there are enough Available Earnings.

Available Earnings outlined in Step 1 (A) above for crediting to the County Safety Voluntary Contribution Reserve will be determined without regard to any known deferred investment gains or losses carried over from periods before the County makes an additional UAAL contribution to that Reserve.

Interest will be credited to the County Safety Voluntary Contribution Reserve using the weighted outstanding balance of that Reserve after taking into consideration periodic transfers made from that Reserve to the Employer Advance Reserve and the Cost-of-Living Reserve to offset the County's Safety UAAL contribution requirement.

The Board may transfer funds from the Contingency Reserve to different valuation reserves at different rates (including no transfer at all to one or more valuation reserves) in order to take account of the timing of extraordinary employer contributions to ACERA in a manner that is equitable to all employers and the SRBR.

C. Deduct the interest credited above from Available Earnings which includes the Contingency Reserve Account even if that Account was just restored to 1% in Step 2A[1]. If the amount of interest credited is more than the Available Earnings, credit in Step 2B only up to the amount of the Available Earnings.

Step 3 Maintain a Contingency Reserve of 1%

Transfer from any remaining Available Earnings from Step 2C into the Contingency Reserve the amount required to maintain a Contingency Reserve of 1% of total assets.

VII. Excess Interest Crediting Process

Apply any remaining available earnings (excess earnings) as follows:

A. Allocate one-half of any remaining earnings to the SRBR.

B. Allocate the other one-half of the remaining earnings to the valuation reserves and the 401(h) Reserve Account in proportion to the amounts in each of those reserves, on the balance in the fund for at least six full months.

The above allocation to the County Safety Voluntary Contribution Reserve will be determined without regard to any known deferred investment gains or losses carried over from periods before the County makes an additional UAAL contribution to that Reserve.

[1] *Restoring the Contingency Reserve to 1% in Step 2A and immediately including the amount in that Reserve as Available Earnings in Step 2C in the same interest crediting period would have the effect of not restoring the 1% Contingency Reserve for use in the subsequent interest crediting period until Step 3, i.e., until after crediting interest to all the reserves in Step 2B. This order of crediting interest to the Reserves has been researched by ACERA's legal counsel and determined to be a reasonable exercise of discretion available to the Board in accordance with Government Code Section 31616. It would also result in more stable pattern of interest crediting in some situations, based on scenarios developed by ACERA's actuary.*

The above allocation to the County Safety Voluntary Contribution Reserve will be made using the weighted outstanding balance of that Reserve after taking into consideration periodic transfers made from that Reserve to the Employer Advance Reserve and the Cost-of-Living Reserve to offset the County's Safety UAAL contribution requirement.

VIII. Policy Review

This policy has been adopted by a majority vote of the ACERA Board, and can be amended by the ACERA Board by a majority vote. This policy is effective with the six-month interest crediting period ending December 31, 2015. This policy will be reviewed as deemed necessary.

IX. Policy History

A. The Board adopted this policy on December 17, 2015.

B. The Board approved this policy, without revisions, on November 8, 2018.

Exhibit A

Glossary

Actuarial Terms and Definitions

The following list defines certain technical terms relevant to the Regular Interest and Excess Interest Crediting Policy for the convenience of the reader:

Investment Return

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain, and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return reflects a smoothing of market gains and losses to avoid significant swings in the value of assets from one year to the next.

Actuarial Value of Assets

Market value of assets less unrecognized market value gains and losses from each of the last five years. Market value gains and losses are equal to the difference between the actual market return and the expected return on the market value, and are recognized semi-annually over a five-year period. The actuarial value of assets is limited to no greater than 140% or less than 60% of the market value of assets.

Valuation Value of Assets

The actuarial value of assets reduced by the value of the Non-Valuation Reserves (401(h) Reserve Account, SRBR and Contingency Reserve (unless negative).

Assumed Annual Valuation Interest Rate

This is the interest rate adopted by the Board from the actuarial valuation that established the employer and employee contribution rates for that fiscal year.

ALAMEDA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION

Actuarial Funding Policy

I. Purpose

The purpose of the Actuarial Funding Policy (Policy) is to record the funding objectives and policy set by the Board of Retirement (Board) for the Alameda County Employees' Retirement Association (ACERA). This Policy is to ensure the systematic funding of future benefit payments for members of ACERA. In addition, this Policy records guidelines established by the Board to assist in administering ACERA's retirement fund in a consistent and efficient manner.

II. Assumptions

A. ACERA is a public employee retirement system that was established in 1948 to provide retirement allowances and other benefits to all permanent General and Safety employees of the County of Alameda and participating special districts.

B. These benefits are financed through a combination of employee and employer contributions along with the investment return on those contributions. Benefit and contribution level may vary within ACERA depending on the member's classification (General or Safety), tier and by participating employer (the County or one of the Special Districts).

C. ACERA is governed by the provisions of the County Employees Retirement Law of 1937 (1937 Act). Alameda County adopted Article 5.5 of the 1937 Act. This Article creates a Supplemental Retiree Benefit Reserve (SRBR) through which the Board may pay supplemental benefits to retirees and beneficiaries.

D. An actuarial valuation is performed annually as of December 31 of each year to determine the contribution rates for the fiscal year that begins 6 months after the valuation date.

E. This Policy applies to "regular benefits" which refer to the retirement, disability, survivor and withdrawal benefits, and all cost-of-living increases that were adopted by the County of Alameda (or the special districts) and whose payments are guaranteed by those agencies. This Policy does not cover benefits financed by the SRBR. Also, this Policy does not cover the interest crediting procedure that is used by the Board to allocate earnings among the different reserves (i.e., the valuation reserves used for the "regular benefits" and SRBR for "excess earnings benefits").

F. This Policy supersedes any previous actuarial funding policies.

III. Objectives

A. To achieve long-term full funding of the cost of "retiree benefits" provided by ACERA;

B. To seek reasonable and equitable allocation of the cost of "retiree benefits" over time;

C. To minimize volatility of the plan sponsor's contribution to the extent reasonably possible, consistent with other policy goals; and

D. To the extent that it does not conflict with the above goals, the Board will try to pool risks across all portions of ACERA to the extent that groups of members have similar benefit provisions, contribution provisions and contribution histories. Separate cost sharing groups will be set up to recognize meaningful differences in benefit structure (e.g., Safety or General), employer contribution history (e.g., payment of extraordinary contributions like Pension Obligation Bond payments and credit from reimbursement of implicit retiree health benefit subsidy) and benefit changes for a specific employer.

IV. Funding Requirements and Components

ACERA annual funding requirement for "regular benefits" is comprised of a payment of the Normal Cost and a payment towards the Unfunded Actuarial Accrued Liability (UAAL). The Normal Cost and the amount of payment on UAAL are determined by the following three components of this Policy:

A. Actuarial Cost Method: the techniques to allocate the total Present Value of Future Benefits to each years of service, including all past years;

B. Asset Smoothing Method: the techniques that spread the recognition of investment gains or losses over a period of time for the purposes of determining the Actuarial Value of Assets used in the actuarial valuation process; and

C. Amortization Policy: the decisions on how, in terms of duration and pattern of contributions, to reduce the difference between the Actuarial Accrued Liability and the Valuation Value of Assets in a systematic manner.

Actuarial Cost Method:

The Entry Age method shall be applied to the projected retirement benefits in determining the Normal Cost and the Actuarial Accrued Liability. The Normal Cost shall be determined on an individual basis for each active member.

Asset Smoothing Method:

The investment gains or losses of each valuation period, as a result of comparing the actual market return and the expected market return, shall be recognized semi-annually in level amounts over 5 years in calculating the Actuarial Value of Assets. Total Net Deferred investment gains or losses cannot exceed 40% of the Market Value of Assets. Note that the Valuation Value of Assets is the Actuarial Value of Assets reduced by any applicable Non-Valuation Reserves, as defined in ACERA's Interest Crediting Policy.

A separate five-year asset smoothing schedule that excludes any known deferred investment gains or losses carried over from periods before the County makes a voluntary additional Safety UAAL contribution will apply to the amounts in the County Safety Voluntary Contribution Reserve attributable to such voluntary contribution (including previously credited interest) until the contribution has been on deposit for five years. Thereafter, the same five-year asset smoothing schedule used for the other valuation reserves will be used for the outstanding balance of amounts attributable to that contribution.

Amortization Policy:

A. The UAAL, (i.e., the difference between the Actuarial Accrued Liability and the Valuation Value of Assets), as of December 31, 2011 shall be amortized separately from any future changes in UAAL over a period of 21 years from December 31, 2011.

B. After December 31, 2011, any new UAAL as a result of actuarial gains or losses identified in the annual valuation as of December 31 will be amortized over a period of 20 years.

C. After December 31, 2011, any new UAAL as a result of change in actuarial assumptions or methods will be amortized over a period of 20 years.

D. A County voluntary Safety UAAL contribution to the County Safety Voluntary Contribution Reserve, and accrued interest thereon, will be used to offset the County's Safety UAAL contributions that would otherwise be required of the County over a period determined by the Board. The annual actuarial valuation report will show both (1) the County's Safety contribution rate in the absence of such transfers, and (2) the County's actual Safety contribution rate, which takes account of such transfers.

~~D.~~E. Unless an alternative amortization period is recommended by the Actuary and accepted by the Board based on the results of an actuarial analysis:

1. With the exception noted in ~~b~~2., below, the change in UAAL as a result of any plan amendments will be amortized over a period of 15 years or less;

2. The increase in UAAL resulting from a temporary retirement incentive, including the impact of benefits resulting from additional service permitted under Section 31641.04 of the 1937 CERL (Golden Handshake), will be funded over a period of up to 5 years.

~~E.~~F. UAAL shall be amortized over "closed" amortization periods so that the remaining amortization period for each layer decreases by one year with each actuarial valuation.

~~F.~~G. UAAL shall be amortized as a level percentage of payroll so that the amortization amount in each year during the amortization period shall be expected to be a level percentage of covered payroll, taking into consideration the current assumption for general payroll increase.

~~G.~~H. If an overfunding exists (i.e., the total of all UAAL becomes negative so that there is a surplus) and the amount of such surplus is in excess of 20% of the AAL per Section 7522.52 of PEPRA, such surplus that is in excess of 20% of the AAL and any subsequent such surpluses will be amortized over an "open" amortization period of 30 years. Any prior UAAL amortization layers will be considered fully amortized, and any subsequent UAAL will be amortized over 20 years as the first of a new series of amortization layers.

~~H.~~I. These amortization policy components will apply separately to each of ACERA's UAAL cost sharing groups.

V. Other Policy Considerations

A. Timing of Contributions

1. The contribution rates determined in each valuation (as of December 31) will apply to the fiscal year that begins after the date of the valuation. The UAAL contribution rates in the actuarial valuation are not adjusted in advance to account for this delay.

2. Any change in contribution rate requirement that results from a plan amendment (including a change in member contribution rates) is generally implemented as of the effective date of the plan amendment or as soon as administratively feasible.

3. For purposes of calculating employer contributions, the employer and member contributions are assumed to be made during consistent intervals throughout the year.

B. Cost Groups

Separate cost groups will be set up in order to recognize differences in benefit structure (e.g., General Tiers 1 through 4 and Safety Tiers 1, 2, 2C, 2D and 4), member contribution levels, employer contribution history (e.g., payment of extraordinary contributions like Pension Obligation Bond (POB) payments as well as any credit from reimbursement of implicit retiree health benefit subsidy), and other differences that the Board deems significant, such as benefit changes for a specific employer.

An employer may be contributing to one or more different cost groups depending on the benefit structure adopted for its employees.

1. ACERA's total (employer and member) Normal Cost is determined separately for each group of members that have the same benefit formula (on a prospective basis) based on the Actuarial Cost Method described above. This means that to the extent

that members have the same plan provisions for future benefit accruals, then the total Normal Cost (as a percentage of payroll) for those employers will be the same.

2. The net employer Normal Cost is calculated by reducing the total Normal Cost for expected member contributions. This is done separately for each of the different member contribution arrangements and benefit structures that exist for the various employers. The various member contribution arrangements are described in more detail in the actuarial valuation report.

3. ACERA's UAAL is determined separately based on contribution and benefit history. This means that there could be separate calculations of AAL for cost groups that have significantly different contribution histories, or prior benefit accrual provisions (e.g., General versus Safety). Plan assets are tracked separately for groups with different UAAL contribution histories unless otherwise established by the Board.

4. There is a further adjustment made to the UAAL contribution rate for LARPD General Tiers 3 and 4 to account for the District's Tier 3 employees receiving the 2.5% @ 55 formula for past service and the payment of the District's other UAAL as a level percent of payroll over a closed amortization period. This adjustment is described in more detail in the actuarial valuation report.

5. The outstanding balance in the County Safety Voluntary Contribution Reserve will be adjusted with interest under the Interest Crediting Policy and to account for transfers from that Reserve to the Employer Advance Reserve and the Cost-of-Living Reserve to offset the Safety UAAL contributions that would otherwise be required of the County. The Actuary will monitor the available contribution offset and recommend modifications to the Board if actual experience causes significant changes to the offset expected from that Reserve.

VI. Glossary of Funding Policy Terms

Present Value of Future Benefits (PV~~F~~B): the present value at a particular point in time of all projected future benefit payments for current plan members. The future benefit payments and the present value of those payments are determined using actuarial assumptions as to future events. Examples of these assumptions are estimates of retirement patterns, salary increases, investment returns, etc. Another way to think of the PVB is that if the plan has assets equal to the PVB and all actuarial assumptions are met, then no future contributions would be needed to provide all future service benefits for all current members, including future service and salary increases for current active members.

Actuarial Cost Method: allocates a portion of the total cost (PVB) to each year of service, both past service and future service.

Normal Cost (NC): the cost allocated under the Actuarial Cost Method to each year of active member service.

Entry Age Actuarial Cost Method: A funding method that calculates the Normal Cost as a level percentage of pay over the working lifetime of the plan's members.

Actuarial Accrued Liability (AAL): the value at a particular point in time of all past Normal Costs. This is the amount of assets the plan would have today if the current plan provisions, actuarial assumptions and participant data had always been in effect, contributions equal to the Normal Cost had been made and all actuarial assumptions came true.

Market Value of Assets (MVA): the fair value of assets of the plan as reported in the plan's audited financial statements.

Actuarial Value of Assets (AVA) or smoothed value: a market-related value of the plan assets. The AVA tracks the market value of assets over time and smoothes out short-term fluctuations in market values.

Valuation Value of Assets (VVA): the value of assets used in the actuarial valuation to determine contribution rate requirements. It is equal to the Actuarial Value of Assets reduced by the value of any applicable Non-Valuation Reserves as defined in ACERA's Interest Crediting Policy. In particular, the VVA will not include assets allocated to the SRBR.

Unfunded Actuarial Accrued Liability (UAAL): the positive difference, if any, between the AAL and the VVA.

Surplus: the positive difference, if any, between the VVA and the AAL.

Actuarial Gains and Losses: changes in UAAL or surplus due to actual experience different from what is assumed in the actuarial valuation. For example, if during a given year the assets (after smoothing) earn more than the investment return assumption, the amount of earnings above the assumption will cause an unexpected reduction in UAAL, or "actuarial gain" as of the next valuation. Actuarial gains and losses include contribution gains and losses that result from actual contributions made being greater or less than the level determined under this Policy.

VII. Policy Modification

The Actuarial Committee, or other committee designated by the Board, shall review this policy at least every three (3) years. The Committee shall make recommendations to the Board concerning any improvements or modifications it deems necessary.

VIII. Policy History

A. The Board adopted this Policy on September 18, 2014.

B. The Board approve this Policy, without revisions, November 8, 2018.