

AGENDA

RETIREMENT BOARD MEETING

REGULAR MEETING May 7, 2025 9:00 a.m. Board Conference Room 1200 Concord Avenue, Suite 350 Concord, California

NOTICE OF TELECONFERENCE MEETING:

ONE OR MORE MEMBERS OF THE BOARD OF RETIREMENT FOR THE CONTRA COSTA COUNTY EMPLOYEES' RETIREMENT ASSOCIATION MAY PARTICIPATE IN THE BOARD MEETING, SCHEDULED FOR MAY 7, 2025, VIA TELECONFERENCE AT THE LOCATION LISTED BELOW, WHICH IS OPEN TO THE PUBLIC.

TELECONFERENCE LOCATION: Iroquois Hotel 49 West 44th Street New York, NY 10036

THE LOCATION LISTED ABOVE IS ACCESSIBLE TO THE PUBLIC, INCLUDING THOSE WITH DISABILITIES.

THE RETIREMENT BOARD MAY DISCUSS AND TAKE ACTION ON THE FOLLOWING:

- 1. Pledge of Allegiance.
- 2. Public Comment (3 minutes/speaker).
- 3. Recognition of Michelle Reyes for 25 years of service.

The Retirement Board will provide reasonable accommodations for persons with disabilities planning to attend Board meetings who contact the Retirement Office at least 24 hours before a meeting.

CONSENT ITEMS

- 4.A All Consent Items are to be approved by one action unless a Board Member requests separate action on a specific item. (Action Item)
 - I. Approve minutes from the April 2, 2025 and April 16, 2025 meetings.
 - II. Approve the following routine items:
 - a. Certifications of membership.
 - b. Service and disability allowances.
 - c. Death benefits.
 - d. Investment liquidity report.
 - III. Accept the following routine items:
 - a. Disability applications and authorize subpoenas as required.
 - b. Investment asset allocation report.
- 4.B Consider and take possible action on Consent Items previously removed, if any. (Action Item)

DISCUSSION ITEMS

- 5. Presentation from Segal Consulting: Review of Actuarial Assumptions. (Presentation Item)
- 6. Consider and take possible action to adopt the actuarial assumptions to be utilized in the December 31, 2024 actuarial valuation report. (Action Item)
- 7. Review of private credit by StepStone. (Presentation Item)
- 8. Review of report on liquidity sub-portfolio. (Presentation Item)
- 9. Consider and take possible action to authorize the CEO to renew a maintenance and support agreement with CPAS Systems, Inc. (Action Item)
- Consider authorizing the attendance of Board: (Action Item)
 a. NCPERS Public Pension Funding Forum, August 17-19, 2025, Chicago, IL.
- 11. Reports. (Presentation item)
 - a. Trustee reports on meetings, seminars and conferences.
 - b. Staff reports

The Retirement Board will provide reasonable accommodations for persons with disabilities planning to attend Board meetings who contact the Retirement Office at least 24 hours before a meeting.

CLOSED SESSION

12. The Board will go into closed session to review the status of the following disability retirement applications pursuant to Govt. Code Section 54957:

Member

- a. Aaron All
- b. Laurel Becnel
- c. Mary Hooker
- d. Neila Viernes
- 13. The Board will continue in closed session pursuant to Govt. Code Section 54957 to consider recommendations from the medical advisor and/or staff regarding the following disability retirement applications:

Member	Type Sought	Recommendation
a. Matthew Bourque	Service Connected	Non-Service Connected
b. Jerry Fernandez	Service Connected	Service Connected
c. Geoffrey Nelsen	Service Connected	Service Connected

The Board will continue in closed session pursuant to Govt. Code Section 549569(d)(1) to confer with legal counsel regarding pending litigation:
 Mulligan v. CCCERA, Contra Costa County Superior Court, Case No.: N25-0725

The next meeting is currently scheduled for May 21, 2025 at 9:00 a.m.

Adjourn

The Retirement Board will provide reasonable accommodations for persons with disabilities planning to attend Board meetings who contact the Retirement Office at least 24 hours before a meeting.





RETIREMENT BOARD MEETING MINUTES

REGULAR MEETING April 2, 2025 9:00 a.m. Board Conference Room 1200 Concord Avenue, Suite 350 Concord, California

- Present: Candace Andersen, Dennis Chebotarev, Donald Finley, Scott Gordon, Jerry Holcombe, Louie Kroll, Jay Kwon, David MacDonald, Dan Mierzwa, John Phillips, Mike Sloan, and Samson Wong
- Absent: None
- Staff: Christina Dunn, Chief Executive Officer; Karen Levy, General Counsel; and Ryan Luis, Retirement Services Manager

Outside Professional Support: Reid Earnhardt Andrew Brown Angela Tang Representing: Milliman, Inc PFM Asset Management PARS

1. Pledge of Allegiance

The Board, staff and audience joined in the Pledge of Allegiance.

2. Accept comments from the Public

No member of the public offered comment.

3A. Consent Items:

It was **M/S/C** to approve all consent items. (Yes: Andersen, Chebotarev, Gordon, Holcombe, Kroll, MacDonald, Mierzwa, Phillips, and Wong).

3B. Consider and take possible action on Consent Items if previously removed, if any

No action taken on this item.

Kwon was available for subsequent discussion and voting.

4. <u>Presentation from Milliman regarding the December 31, 2024 Other Post-Employment</u> <u>Benefits (OPEB) valuation report</u>

Earnhardt presented the December 31, 2024 Other Post-Employment Benefits (OPEB) valuation report.

5. <u>Presentation from PARS (Public Agency Retirement Services) regarding the I.R.C. Section</u> <u>115 Trust for Other Post-Employment Benefits for CCCERA Employees</u>

Brown and Tang gave a presentation regarding the I.R.C. Section 115 Trust for Other Post-Employment Benefits for CCCERA Employees.

6. Presentation of Annual Disability Retirement Report

Elise Diliberto and Luis gave a presentation on the Annual Disability Retirement Report.

7. <u>Consider and take possible action on SACRS Board of Directors Election</u>

It was **M/S/C** to support the SACRS Nominating Committee recommended ballot. (Yes: Andersen, Chebotarev, Gordon, Holcombe, Kroll, MacDonald, Mierzwa, Phillips and Wong).

8. <u>Consider authorizing the attendance of Board:</u>

- a. It was **M/S/C** to approve 1 Board member at the Washington Legislative Update, May 19-20, 2025, Washington, DC. (Yes: Andersen, Chebotarev, Gordon, Holcombe, Kroll, MacDonald, Mierzwa, Phillips, and Wong).
- b. It was the consensus of the Board to table this item until the April 16, 2025 meeting. SACRS/UC Berkeley Program, July 13-16, 2025, Berkeley, CA.
- c. It was **M/S/C** to approve 1 Board member at the IDAC 4th Annual Global Summit on Talent Maximization, September 23-25, 2025, San Antonio, TX. (Yes: Andersen, Chebotarev, Gordon, Holcombe, Kroll, MacDonald, Mierzwa, Phillips, and Wong).

9. <u>Reports</u>

- a. Trustee reports on meetings, seminars, and conferences Gordon and MacDonald reported out on the NASP Conference, Marina Del Rey, CA. Both trustees thought it was a very good and interesting conference. MacDonald reported that he attended the Verus due diligence meeting on March 28 in Seattle, WA.
- b. Staff reports Dunn provided an update on the March retirements, stating we ended the month with 141 retirements compared to 110 last year.

CLOSED SESSION

The Board moved into closed session pursuant to Govt. Code Section 54957 to consider recommendations from the medical advisor and/or staff regarding disability retirement applications.

The Board moved into open session and reported the following:

10. Disability Applications:

It was **M/S/C** that there was insufficient evidence to grant Justin Rabara a serviceconnected disability retirement

(Yes: Andersen, Chebotarev, Gordon, Holcombe, Kroll, MacDonald, Mierzwa, Phillips, and Wong).

11. <u>The Board continued in closed session pursuant to Govt. Code Section 54957 to evaluate</u> <u>the performance of the following public employee:</u>

Title: Chief Executive Officer

No reportable action.

Kroll was not present for subsequent discussion and voting.

12. CONFERENCE WITH LABOR NEGOTIATORS (Government Code Section 54957.6)

Agency designated representative: Christina Dunn, Chief Executive Officer

Unrepresented Employees: All CCCERA unrepresented positions

No reportable action.

It was **M/S/C** to adjourn the meeting. (Yes: Andersen, Chebotarev, Gordon, Holcombe, MacDonald, Mierzwa, Phillips, Sloan and Wong)

Scott W. Gordon, Chairperson

Jerry R. Holcombe, Secretary





RETIREMENT BOARD MEETING MINUTES

REGULAR MEETING April 16, 2025 9:00 a.m. Board Conference Room 1200 Concord Avenue, Suite 350 Concord, California

Present: Candace Andersen, Dennis Chebotarev, Donald Finley, Scott Gordon, Jerry Holcombe, Jay Kwon, Dan Mierzwa, and John Phillips

Absent: Louie Kroll, David MacDonald, Mike Sloan, and Samson Wong

Staff: Christina Dunn, Chief Executive Officer; Erica Grant, Human Resources Manager Karen Levy, General Counsel; and Tim Price, Chief Investment Officer

Outside Professional Support: None **Representing:**

- **1.** <u>Pledge of Allegiance</u> The Board, staff and audience joined in the *Pledge of Allegiance*.
- 2. <u>Accept comments from the public</u> No member of the public offered comment.
- <u>Approve minutes from the March 19, 2025 meeting</u> It was M/S/C to approve the minutes from the March 19, 2025 meeting. (Yes: Andersen, Chebotarev, Finley, Gordon, Holcombe, Mierzwa, and Phillips).
- 4. <u>Consider and take possible action to adopt Board of Retirement Resolution No. 2025-4,</u> <u>Investment Asset Allocation Targets and Ranges</u>

It was **M/S/C** to adopt Board of Retirement Resolution No. 2025-4, Investment Asset Allocation Targets and Ranges. (Yes: Andersen, Chebotarev, Finley, Gordon, Holcombe, Mierzwa, and Phillips).

5. <u>Consider and take possible action to cancel the meeting on July 16, 2025 and add a</u> meeting on July 9, 2025

It was **M/S/C** to cancel the meeting on July 16, 2025 and add a meeting on July 9, 2025. (Yes: Andersen, Chebotarev, Finley, Gordon, Holcombe, Mierzwa, and Phillips).

It was the consensus of the Board to move to Item 8.

8. <u>Consider authorizing the attendance of Board:</u>

- a. It was **M/S/C** to authorize the attendance of 3 Board members at the CALAPRS Trustee Round Table, May 30, 2025, Virtual. (Yes: Andersen, Chebotarev, Finley, Gordon, Holcombe, Mierzwa, and Phillips).
- b. It was **M/S/C** to authorize the attendance of all Board members at the SACRS/UC Berkeley Program, July 13-16, 2025, Berkeley, CA. (Yes: Andersen, Chebotarev, Finley, Gordon, Holcombe, Mierzwa, and Phillips).

It was the consensus of the Board to move to Closed Session.

CLOSED SESSION

The Board moved into open session and reported the following:

- **10.** The Board will go into closed session pursuant to Govt. Code Section 549569(d)(1) to confer with legal counsel regarding pending litigation:
 - a. *Stewart v. CCCERA Board of Retirement, et al.,* Contra Costa County Superior Court, Case No. N-23-2108
 - b. *Stewart v. CCCERA Board of Retirement, et al.,* Contra Costa County Superior Court, Case No. C24-02944.
 - c. *Demarty Ooghe v. Sierra Pacific Properties, Inc., et al.*, Contra Costa County Superior Court, Case No. C24-03026

There was no reportable action related to Govt. Code Section 549569(d)(1).

11. The Board will continue in closed session pursuant to Govt. Code Section 54956.9(d)(2) to confer with legal counsel regarding anticipated litigation.

There was no reportable action related to Govt. Code Section 54956.9(d)(2).

6. It was the consensus of the board to table this item.

7. It was the consensus of the board to table this item.

9. <u>Reports</u>

- a. Trustee reports on meetings, seminars, and conferences None
- b. Staff reports Price reported on private equity and real estate commitments, stating they are performing well. He went on to further discuss the current market conditions.

The next meeting is currently scheduled for May 7, 2025, at 9:00 a.m.

It was **M/S/C** to adjourn the meeting. (Yes: Andersen, Chebotarev, Finley, Gordon, Holcombe, Mierzwa, and Phillips)

Scott W. Gordon, Chairperson

Jerry R. Holcombe, Secretary

CERTIFICATION OF MEMBERSHIPS



	Employee		Membership	
<u>Name</u>	<u>Number</u>	<u>Tier</u>	<u>Date</u>	<u>Employer</u>
Alper, Samuel	96373	P5.2	03/01/25	Contra Costa County
Andres, Jenny	96292	P5.2	03/01/25	Contra Costa County
Bell, Tamicha	96290	P5.2	03/01/25	Contra Costa County
Blanch, Maria	79727	P5.2	03/01/25	Contra Costa County
Budhathoki, Madhav	96335	P5.2	03/01/25	Contra Costa County
Cardenas, Teasha	95894	P5.2	03/01/25	Contra Costa County
Chapman, Neil	96272	P5.2	03/01/25	Contra Costa County
Clarino, Renna	96347	P5.2	03/01/25	Contra Costa County
Cohen, Grey	D9500	P5.3	03/01/25	Contra Costa County Superior Court
Collard, Brianna	96322	P5.2	03/01/25	Contra Costa County
Contreras, Juan	96281	P5.2	03/01/25	Contra Costa County
Dean, Rachael	D9500	P5.3	03/01/25	Contra Costa County Superior Court
Dolkar, Chime	95369	P5.2	03/01/25	Contra Costa County
Engle, Jonathan	D7830	S/D	03/01/25	San Ramon Valley Fire Protection District
Fernandes Canseco, Gabriela	96304	P5.2	03/01/25	Contra Costa County
Finlinson, Wade	88597	III	03/01/25	Contra Costa County
Franco, Alejandra	90046	P5.2	03/01/25	Contra Costa County
Galvan, Patricia	96256	P5.2	03/01/25	Contra Costa County
Garcia, Dacia	93888	P5.2	03/01/25	Contra Costa County
Ge, Hongfeng	95938	P5.2	03/01/25	Contra Costa County
Goodall, Joshua	96279	P5.2	03/01/25	Contra Costa County
Gratteri, Amalia	85391	P5.2	03/01/25	Contra Costa County
Green, Shantal	96348	P5.2	03/01/25	Contra Costa County
Green, Tammy	96247	P5.2	03/01/25	Contra Costa County
Hall, Warren	96295	P5.2	03/01/25	Contra Costa County
Hogan, Theresa	94840	P5.2	03/01/25	Contra Costa County
Huffstutler, Natasha	96331	P5.2	03/01/25	Contra Costa County
Jacobs, Britnae	96329	P5.2	03/01/25	Contra Costa County
Jovero, Mark	95673	P5.2	03/01/25	Contra Costa County
Joyner, Wendell	96263	P5.2	03/01/25	Contra Costa County
Kaushik, Vrinda	96306	P5.2	03/01/25	Contra Costa County
Kondo-Cohen, Evelyn	96321	P5.2	03/01/25	Contra Costa County
Lam, Anh	96330	P5.2	03/01/25	Contra Costa County
Landeros, Fabian	96341	P5.2	03/01/25	Contra Costa County

I = Tier I	P4.2 = PEPRA Tier 4 (2% COLA)	S/A = Safety Tier A
II = Tier II	P4.3 = PEPRA Tier 4 (3% COLA)	S/C = Safety Tier C
III = Tier III	P5.2 = PEPRA Tier 5 (2% COLA)	S/D = Safety Tier D
	P5.3 = PEPRA Tier 5 (3% COLA)	S/E = Safety Tier E

CERTIFICATION OF MEMBERSHIPS

	Employee		Membership	
<u>Name</u>	<u>Number</u>	<u>Tier</u>	<u>Date</u>	<u>Employer</u>
Leon, Edith	94226	P5.2	03/01/25	Contra Costa County
Low, Jamila	96273	P5.2	03/01/25	Contra Costa County
Mallari, Matthew Brix	96287	P5.2	03/01/25	Contra Costa County
Mark, Gretchen	96241	P5.2	03/01/25	Contra Costa County
Martinez, Brian	D7830	S/D	03/01/25	San Ramon Valley Fire Protection District
Martinez, Odetee	96230	P5.2	03/01/25	Contra Costa County
Martinez, Yadira	96325	P5.2	03/01/25	Contra Costa County
Mathias, Jennifer	96289	P5.2	03/01/25	Contra Costa County
Membreno, Sheila	93999	P5.2	03/01/25	Contra Costa County
Mesa, Rene	D9500	P5.3	03/01/25	Contra Costa County Superior Court
Mora, Abel	96284	P5.2	03/01/25	Contra Costa County
Morales, Elizabeth	96324	P5.2	03/01/25	Contra Costa County
Nabus, Gerardo	96339	P5.2	03/01/25	Contra Costa County
Nguyen, Christine	96344	P5.2	03/01/25	Contra Costa County
Nguyen, Katie	94290	P5.2	03/01/25	Contra Costa County
Noori, Nagia	96250	P5.2	03/01/25	Contra Costa County
Nubla, Jonathan	94756	P5.2	03/01/25	Contra Costa County
Oladejo, Ayodeji	96327	P5.2	03/01/25	Contra Costa County
Ortiz Contreras, Jose	96236	P5.2	03/01/25	Contra Costa County
Ozuna, Isabelle	90037	P5.2	03/01/25	Contra Costa County
Pena, Alexander	96310	P5.2	03/01/25	Contra Costa County
Peralta, Stacy	96283	P5.2	03/01/25	Contra Costa County
Phenix, Doritina	96343	P5.2	03/01/25	Contra Costa County
Pittman, Auzuray	96264	P5.2	03/01/25	Contra Costa County
Ramey, Teresa	95519	P5.2	03/01/25	Contra Costa County
Raphael, Francesca	96342	P5.2	03/01/25	Contra Costa County
Raza, Fariha	88723	P5.2	03/01/25	Contra Costa County
Reyes, Monique	D9500	P5.3	03/01/25	Contra Costa County Superior Court
Richards, Aaron James	D3406	P4.3	03/01/25	Central Contra Costa Sanitary District
Rivas, Patricia	D9990	P4.3	03/01/25	Contra Costa County Housing Authority
Robles-Castro, Alma	96336	P5.2	03/01/25	Contra Costa County
Rogers, Cindy	96246	P5.2	03/01/25	Contra Costa County
Rogers, Nicole	96278	P5.2	03/01/25	Contra Costa County

I = Tier I	P4.2 = PEPRA Tier 4 (2% COLA)	S/A = Safety Tier A
II = Tier II	P4.3 = PEPRA Tier 4 (3% COLA)	S/C = Safety Tier C
III = Tier III	P5.2 = PEPRA Tier 5 (2% COLA)	S/D = Safety Tier D
	P5.3 = PEPRA Tier 5 (3% COLA)	S/E = Safety Tier E

CERTIFICATION OF MEMBERSHIPS

	Employee		Membership	
<u>Name</u>	<u>Number</u>	<u>Tier</u>	<u>Date</u>	<u>Employer</u>
Salcedo, Briana	95253	P5.2	03/01/25	Contra Costa County
Salcedo, Isaac	96361	S/E	03/01/25	Contra Costa County
Sandhu, Preetkanwar	93868	P5.2	03/01/25	Contra Costa County
Sevilla, Stephanie	96280	P5.2	03/01/25	Contra Costa County
Shippey, Morgan	96223	P5.2	03/01/25	Contra Costa County
Silsby, Jordan	96245	P5.2	03/01/25	Contra Costa County
Sims, Anissa	96291	P5.2	03/01/25	Contra Costa County
Singh, Amandeep	88560	P5.2	03/01/25	Contra Costa County
Singh, Madhulika	93441	P5.2	03/01/25	Contra Costa County
Smith, Robert	96244	P5.2	03/01/25	Contra Costa County
Stewart, Maegan	96328	P5.2	03/01/25	Contra Costa County
Sukhu, Suraj	90804	P5.2	03/01/25	Contra Costa County
Szczepanski, Matthew	96326	P5.2	03/01/25	Contra Costa County
Tejada-Joya, Roxana	D9500	P5.3	03/01/25	Contra Costa County Superior Court
Thai, Derrick	96320	P5.2	03/01/25	Contra Costa County
Travenia, Jessica	96337	P5.2	03/01/25	Contra Costa County
Vazquez Cruz, Sofia	96323	P5.2	03/01/25	Contra Costa County
Vien, Eddy	96340	P5.2	03/01/25	Contra Costa County
Walker, Amber	75155	P5.2	03/01/25	Contra Costa County
Wilcock, Lora	96299	P5.2	03/01/25	Contra Costa County
Wilson, Alisha	96282	P5.2	03/01/25	Contra Costa County
Winograd, Riley	88834	P5.2	03/01/25	Contra Costa County
Wright, Andrea	96334	P5.2	03/01/25	Contra Costa County
Yamaguchi, Linda	96333	P5.2	03/01/25	Contra Costa County
Yosofy, Mohammad Baqir	95545	P5.2	03/01/25	Contra Costa County
Zaldana, Kelly	93268	P5.2	03/01/25	Contra Costa County
Zeng, Eilan	96332	P5.2	03/01/25	Contra Costa County

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I = Tier I	P4.2 = PFPRA Tier 4 (2% COLA)	S/A = Safety Tier A
II = Tier II	P4.3 = PEPRA Tier 4 (3% COLA)	S/C = Safety Tier C
III = Tier III	P5.2 = PEPRA Tier 5 (2% COLA)	S/D = Safety Tier D
	P5.3 = PEPRA Tier 5 (3% COLA)	S/E = Safety Tier E

TIER CHANGES

Name	Employee Number	Old Tier	New Tier	Effective Date	Employer	Reason for Change
Oroneza Leticia	96055	D5 2		01/01/25	Contra Costa County	Reciprocity Established
Pinon-Cheek Adrianna	88586	P5 2	D/ 2	01/01/25	CCC Fire Protection District	Transfer Employers
	00500	1 J.2	1 4.2	03/01/23		

I = Tier I	P4.2 = PEPRA Tier 4 (2% COLA)	S/A = Safety Tier A
II = Tier II	P4.3 = PEPRA Tier 4 (3% COLA)	S/C = Safety Tier C
III = Tier III	P5.2 = PEPRA Tier 5 (2% COLA)	S/D = Safety Tier D
-	P5.3 = PEPRA Tier 5 (3% COLA)	S/E = Safety Tier E

SERVICE & DISABILITY RETIREMENT ALLOWANCES

		Effective	Option		
<u>Name</u>	<u>Number</u>	<u>Date</u>	<u>Type</u>	<u>Tier</u>	<u>Selected</u>
Bouchard, Harry	44486AP	03/14/25	SR	II and III	Unmodified
Cardinale, Karen	D9500	01/05/25	SR	ll and lll	Unmodified
Keener, Linda	62803	02/10/25	SR	III	Unmodified
Marshall, Tina	87543	03/28/25	SR	PEPRA 5.2	Unmodified
Martinez, Michelle	D4980	02/04/25	SR	PEPRA 4.3 and 5.2	Unmodified
McGlibery, Ann	D3406	02/27/25	SR	I	Unmodified
Meyer, Paige	D7830	01/24/25	SR	Safety A	Unmodified
Pieralde, Jeana	61496	02/07/25	SR	II and III	Unmodified
Randle, Edward	60746	02/01/25	SR	Safety A	Unmodified
Sanchez, Nohemi	D3406	02/04/25	SR	I	Unmodified
Thomas, Scott	D9500	03/01/25	SR	II and III	Option 2

12/31/24

SR

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55752

Yu, Tao

Option Type	<u>Tie</u>	<u>er</u>
NSP = Non-Specified	I = Tier I	Pepra 4.2 = Pepra Tier 4 (2% COLA)
SCD = Service Connected Disability	II = Tier II	Pepra 4.3 = Pepra Tier 4 (3% COLA)
SR = Service Retirement	III = Tier III	Pepra 5.2 = Pepra Tier 5 (2% COLA)
NSCD = Non-Service Connected Disability	S/A = Safety Tier A	Pepra 5.3 = Pepra Tier 5 (3% COLA)
* = County Advance Selected w/option	S/C = safety Tier C	S/D = Pepra Safety Tier D
		S/E = Pepra Safety Tier E

Unmodified

DEATHS

<u>Name</u>	<u>Date of Death</u>	<u>Employer as of Date of Death</u>
Bowers, Aubrey	03/19/25	Byron-Brentwood-Knightsen Union Cemetery District
Gibson, John	03/10/25	Contra Costa County
Goodwin, Kenneth	03/18/25	Contra Costa County
Griffin, Daniel	03/27/25	San Ramon Valley Fire Protection District
Hicks, Edward	03/11/25	Contra Costa County
Hubbard, Beverly	03/26/25	Contra Costa County
Major, Michael	04/15/25	Contra Costa County
McMurray, Naomi	02/28/25	Contra Costa County
Mondot, Judy	03/24/25	Contra Costa County
Sadler, Anthony	02/21/25	Contra Costa County
Teeter, Philip	04/01/25	Contra Costa County
Wasserman, Franz	03/05/25	Contra Costa County





Contra Costa County Employees' Retirement Association Liquidity Report – March 2025

March 2025 Performance

	Cash Flow	Coverage Ratio
Benefit Cash Flow Projected by Model	\$54,250,000	
Liquidity Sub-Portfolio Cash Flow	\$54,250,000	100%
Actual Benefits Paid	\$53,888,362	100.7%
Next Month's Projected Benefit Payment	\$54,250,000	

Monthly Manager Positioning – March 2025

	Beginning Market Value	Liquidity Market Value Program Change/Other Cash Flow Activity		Ending Market Value
DFA	\$373,556,536	(\$12,000,000)	\$1,404,997	\$362,961,532
Insight	\$616,373,018	(\$20,250,000)	\$2,421,191	\$598,544,209
Sit	\$649,016,062	(\$22,000,000)	\$2,794,506	\$629,810,568
Liquidity	\$1,638,945,616	(\$54,250,000)	\$6,620,693	\$1,591,316,309
Cash	\$547,365,434	\$361,638	\$127,595,085	\$675,322,158
Liquidity + Cash	\$2,186,311,050	(\$53,140,003)	\$134,215,779	\$2,266,638,467

Functional Roles

Manager	Portfolio Characteristics	Liquidity Contribution
Sit	High quality portfolio of small balance,	Pays out net income on monthly basis.
	government guaranteed mortgages with	
	higher yields.	
DFA	High quality, short duration portfolio of	Pays out a pre-determined monthly amount. DFA
	liquid, low volatility characteristics.	sources liquidity from across their portfolio.
Insight	Buy and maintain (limited trading)	Completion portfolio makes a payment through net
	portfolio of high quality, short duration,	income and bond maturities that bridges the gap
	primarily corporates.	between other managers and projected payment.
Cash	STIF account at custodial bank.	Buffer in the event of any Liquidity shortfall/excess.

Notes

The third cash flow for 2025 from the liquidity program was completed on March 21st. The actuarial model cash flow was higher than actual experience, producing \$361 thousand more than the actual benefits paid.

Cash Flow Structure

The chart below shows the sources of cash flow for the next three years of CCCERA's projected benefit payments. This table will change slightly as the model is tweaked and as the portfolios receive new rounds of funding each July as part of the Annual Funding Plan.



DISABILITY RETIREMENT APPLICATIONS

The Board's Hearing Officer is hereby authorized to issue subpoenas in the following cases involving disability applications:

<u>Name</u>	<u>Number</u>	<u>Filed</u>	<u> </u>
Hennis, Daniel	62323	03/28/25	SCD
Ferrante, Dominic	44052	03/28/25	SCD
Goss, Tom	80811	04/03/25	SCD
Pacak, Michael	68804	04/11/25	SCD
Jerge, Dennis	65460	4/10/2025	SCD

Option Type	Tie	<u>er</u>
NSP = Non-Specified	I = Tier I	Pepra 4.2 = Pepra Tier 4 (2% COLA)
SCD = Service Connected Disability	II = Tier II	Pepra 4.3 = Pepra Tier 4 (3% COLA)
SR = Service Retirement	III = Tier III	Pepra 5.2 = Pepra Tier 5 (2% COLA)
NSCD = Non-Service Connected Disability	S/A = Safety Tier A	Pepra 5.3 = Pepra Tier 5 (3% COLA)
* = County Advance Selected w/option	S/C = safety Tier C	S/D = Pepra Safety Tier D
		S/E = Pepra Safety Tier E

Contra Costa County Employees' Retirement Association Asset Allocation as of March 31, 2025

	Market	Percentage	Current Target*	Current Target	Long Term	Long Term
Liquidity	Value	of Total Fund	Percentage	Over/(Under)	Target	Over/(Under)
Dimensional Fund Advisors	362,961,532	3.1%	4.0%	-0.9%		
Insight	598,544,209	5.2%	6.5%	-1.3%		
Sit	629,810,568	5.4%	6.5%	-1.1%		
Total Liquidity	1,591,316,309	13.7%	17.0%	-3.3%	14.0%	-0.3%
		R: 10	ange - 20%			
Growth	I	10	-2076			
Domestic Equity						
Boston Partners	450.555.899	3.9%	3.0%	0.9%		
BlackRock Index Fund	1,235,567,496	10.7%	10.0%	0.7%		
Emerald Advisers	215,061,549	1.9%	1.5%	0.4%		
Ceredex	198,526,762	1.7%	1.5%	0.2%		
Total Domestic Equity	2,099,711,706	18.1%	16.0%	2.1%	11.0%	7.1%
Global & International Equity		4.00/	2 50/	0.50(
Pyrtord (Columbia)	462,501,955	4.0%	3.5%	0.5%		
William Blair	420,349,192	3.6%	3.5%	0.1%		
First Eagle	676,590,213	5.8%	5.5%	0.3%		
Artisan Giobal Opportunities	621,624,047	5.4%	5.5%	-0.1%		
PIMCO/RAE Emerging Markets	251,540,149	2.2%	2.0%	0.2%		
Ti Emerging Markets	247,943,055	2.1%	2.0%	0.1%	17.00/	C 19/
Total Global & International Equity	2,680,548,611	23.1%	22.0%	1.1%	17.0%	0.1%
Private Equity	1,194,838,952	10.3%	10.0%	1.6%	15.0%	-4.7%
Real Assets/Infrastructure	153,038,878	1.3%	2.0%		3.0%	-1.7%
Total Equity		52.8%	50.0%	2.8%		
Total Equity Range		40	-60%			
Private Credit	1,137,435,328	9.8%	10.0%	-0.2%	13.0%	-3.2%
High Yield	169,841,916	1.5%	3.0%	-1.5%	0.0%	1.5%
Total Credit		11.2%	13.0%	-1.8%		
Total Credit Range		8-	·16%			
Real Estate - Value Add	296,726,809	2.6%	2.3%	0.3%	3.0%	-0.4%
Real Estate - Opportunistic & Distressed	311,425,410	2.7%	2.7%	-0.0%	4.0%	-1.3%
Real Estate - REIT			2.0%	0.0%	0.0%	2.0%
Adelante	108,853,081	0.9%				
Invesco	124,394,142	1.1%				
Real Estate Debt	75,000,000	0.6%		0.6%	3.0%	-2.4%
Total Real Estate		7.9%	7.0%	0.9%		
Total Real Estate Range		5-	·10%			
Multi-Asset Credit		0.0%		0.0%	4.0%	-4.0%
Risk Parity			0.0%	0.1%	0.0%	0.1%
PanAgora	8,894,820	0.1%				
Total Other Growth Assets (P.E. thru R.P.)	3,580,449,335	30.2%	32.0%	-1.8%	45.0%	-14.8%
Total Growth Assets	8,360,709,652	72.0%	70.0%	1.5%	73.0%	-1.0%
	0,000,100,000	R	ange			
		60	-80%			
Risk Diversifying	•					
AFL-CIO	274,913,248	2.4%	2.5%	-0.1%	2.5%	-0.1%
BH-DG Systematic	217,229,978	1.9%	2.0%		2.5%	
Sit LLCAR	476,427,195	4.1%	3.5%	0.6%	2.0%	2.1%
Total Risk Diversifying	968,570,421	8.4%	8.0%	0.4%	10.0%	- 1.6 %
		R	ange			
Cash and Our last	l	0%	- 12%	l		
Cash and Overlay	124 202 405	1 10/		1 10/		,
Cash	124,392,403 550 000 673	1.170 A 00/	E 00/	0.20/		
Casii	550,929,673	4.ð%	5.0%	-0.2%		

Contra Costa County Employees' Retirement Association Asset Allocation as of March 31, 2025

Total Cash and Overlay	675,322,158	5.8%	5.0%	0.8%	3.0%	2.8%
Total Cash Range		0-	6%			
Total Fund	11,595,918,541	100% 100%			100%	

*Current targets and ranges reflect asset allocation targets accepted by the Board on August 28, 2024 (BOR Resolution 2024-4).

REAL ESTATE - Value Add	Inception	Target	# of	Discretion	New Target	Funding	Market	% of	Outstanding
	Date	Termination	Extension	by GP/LP	Termination	Commitment	Value	Total Asset	Commitment
Blackstone Strategic Partners Real Estate VIII	11/18/22	11/18/32				80,000,000	30,523,090	0.26%	52,158,815
EQT Exeter Industrial Value Fund VI	06/02/23	06/02/31				60,000,000	22,706,684	0.20%	36,000,000
Invesco IREF IV	12/01/14	12/01/21				35,000,000	97,762	0.00%	3,416,217
Invesco IREF V	09/11/18	09/11/25				75,000,000	57,091,749	0.49%	6,581,100
Invesco IREF VI	09/21/21	09/22/29				100,000,000	53,992,032	0.47%	38,275,303
Jadian Real Estate Fund II, LP	08/29/24	08/29/34				60,000,000	6,113,326	0.05%	53,342,101
Long Wharf FREG III	03/30/07	12/31/17				75,000,000	0	0.00%	
Long Wharf FREG IV	08/14/13	09/30/21				25,000,000	0	0.00%	
Long Wharf FREG V	10/31/16	09/30/24				50,000,000	23,442,352	0.20%	
Long Wharf LREP VI	02/05/20	02/05/28				50,000,000	32,985,631	0.28%	361,552
Long Wharf LREP VII	05/15/23	03/31/32				50,000,000	21,552,797	0.19%	20,668,181
LaSalle Income & Growth Fund VI	01/31/12	01/31/19				75,000,000	8,388,191	0.07%	3,946,000
LaSalle Income & Growth Fund VII	10/31/16	09/30/24				75,000,000	18,651,383	0.16%	87,245
Stockbridge Value Fund V	04/19/24	04/19/34				60,000,000	21,181,812	0.18%	37,007,052
						1,040,000,000	296,726,809	2.56%	251,843,566
	Outstanding C	ommitments			-		251,843,566		

Total

251,843,566	
548,570,375	

REAL ESTATE - Opportunistic & Distressed	Inception	Target	# of	Discretion	New Target	Funding	Market	% of	Outstanding
	Date	Termination	Extension	by GP/LP	Termination	Commitment	Value	Total Asset	Commitment
ARES US REAL ESTATE OPPORTUNITY FUND IV, L.P.	11/06/23	11/06/33				60,000,000	8,853,854	0.08%	41,171,148
Blackstone BREP X	06/30/22	06/30/32				100,000,000	37,556,616	0.32%	64,624,618
Cross Lake Real Estate Fund IV	04/11/23	04/11/33				60,000,000	4,516,156	0.04%	52,769,852
DLJ Real Estate Capital Partners, L.P. III	06/30/05	06/30/14	in full liq.			75,000,000	8,377,693	0.07%	4,031,338
DLJ Real Estate Capital Partners, L.P. IV	12/31/07	09/30/18				100,000,000	28,078,500	0.24%	0
DLJ Real Estate Capital Partners, L.P. V	07/31/13	12/31/22				75,000,000	6,609,433	0.06%	535,678
DLJ Real Estate Capital Partners, L.P. VI	02/28/19	01/31/29				50,000,000	19,973,047	0.17%	4,421,590
KSL Capital VI	10/24/23	10/24/33				50,000,000	13,393,501	0.12%	33,956,734
Oaktree Real Estate Opportunities Fund V	02/01/11	02/01/21				50,000,000	58,418	0.00%	25,750,000
Oaktree Real Estate Opportunities Fund VI	09/30/13	09/30/20				80,000,000	14,303,004	0.12%	18,400,000
Oaktree Real Estate Opportunities Fund VII	02/28/15	02/28/23				65,000,000	37,237,996	0.32%	16,120,000
PCCP Equity IX	04/11/22	04/01/30				75,000,000	78,330,665	0.68%	9,161,925
Siguler Guff Distressed Real Estate Opp. Fund	07/30/11	07/30/22				75,000,000	8,910,745	0.08%	5,625,000
Siguler Guff Distressed Real Estate Opp. Fund II	08/31/13	08/31/25				70,000,000	0	0.00%	8,015,000
Siguler Guff Distressed Real Estate Opp. II Co-Inv	01/31/16	10/31/25				25,000,000	10,663,716	0.09%	3,722,138
Paulson Real Estate Fund II	11/10/13	11/10/20				20,000,000	12,645,179	0.11%	654,377
Angelo Gordon Realty Fund VIII	12/31/11	12/31/18				80,000,000	7,665,539	0.07%	12,334,302
Angelo Gordon Realty Fund IX	10/10/14	10/10/22				65,000,000	14,251,348	0.12%	7,572,500
						1,175,000,000	311,425,410	2.69%	308,866,200

Outstanding Commitments

Total

PRIVATE CREDIT	Inception	Target	# of	Discretion	New Target	Funding	Market	% of	Outstanding
	Date	Termination	Extension	by GP/LP	Termination	Commitment	Value	Total Asset	Commitment
Barings Real Estate Debt Income Fund LP	03/01/25	03/01/35				75,000,000	0	0.00%	75,000,000
Torchlight Debt Opportunity Fund II	09/28/06	09/30/16	in full liq.	1	/	128,000,000	1	0.00%	
Torchlight Debt Opportunity Fund III	09/30/08	06/30/16	2nd 1 YR	LP	06/30/18	75,000,000	0	0.00%	0
Torchlight Debt Opportunity Fund IV	08/01/12	08/30/20		1	/	60,000,000	716,515	0.01%	0
Torchlight Debt Opportunity Fund V	12/31/14	09/17/22		1	/	75,000,000	7,202,614	0.06%	15,000,000
Angelo Gordon Energy Credit Opportunities	09/10/15	09/10/20		1	/	16,500,000	255,938	0.00%	2,319,783
CCCERA StepStone	12/01/17	11/30/27		′	<u> </u>	1,420,000,000	1,129,260,261	9.74%	559,706,055
						1,849,500,000	1,137,435,328	9.81%	652,025,838

308,866,200

620,291,610

1,789,461,166

Total

Dete Termination Litension Vortilization	PRIVATE EQUITY	Inception	Target	# of	Discretion	New Target	Funding	Market	% of	Outstanding
Admin Speet Security V 1072/04 1072/04 1072/04 Number of the sector function of the sector function invocator functin invocator function invocator functin invocator func		Date	Termination	Extension	by GP/LP	Termination	Commitment	Value	Total Asset	Commitment
Adam Steeris Security V 12/31/20 12/31/20 Adam Steeris Security V 30/30.00 3.372-300 0.07% 51/53.00 Adam Steeris Security Invocation Fund 0.03/6/4 6.3/6/26 7.50.00.00 3.43.275.20 0.03/6 5.57.27 Adam Steeris Security Invocation Fund 0.03/6/4 6.3/6/26 7.50.00.00 3.41.275.27 1.2% 5.50.00.00 3.41.275.27 1.2% 5.50.00.00 3.41.275.27 1.2% 5.50.00.00 3.41.275.27 1.2% 5.50.00.00 3.41.275.27 1.2% 5.50.00.00 3.41.275.27 1.2% 5.50.00.00 3.41.275.27 1.2% 5.50.00.00 3.41.275.27 1.2% 5.50.00.00 3.41.275.27 1.2% 5.50.00.00 7.2% 1.2% <td>Adams Street Partners</td> <td>12/22/95</td> <td>12/22/25</td> <td></td> <td></td> <td></td> <td>269,565,614</td> <td>90,932,502</td> <td>0.78%</td> <td>15,922,779</td>	Adams Street Partners	12/22/95	12/22/25				269,565,614	90,932,502	0.78%	15,922,779
Addm Street Scendery V 10/31/2 10/31/2 10/31/2 10/31/2 0.07% 0.37% 0.37% Addm Street Ventree Invocation Fund 09/38/28 0.376/27 75,000,00 10/23/27 0.37% 53,000,00 0.07% 53,000,00 Addm Street Ventreers VI 07/31/27 07/31/27 07/31/2 07/31/2 0.07% 53,000,00 0.07% 50,000,00 Addm Street Ventreers VI 07/31/27 07/31/2 0.0 12/31/21 10.000,00 0.07% 50,000,00 By Area Equity Fund 02/31/21 0.0 12/31/21 10.000,00 0.007% 66,80,51 Carpiert Community Standum 02/31/21 0.0 13,382,71 4,453,511 0.016% 66,80,51 Carpiert Community Standum 02/31/21 0.078/31 10,392,72 0.016% 66,80,54 Carpiert Community Standum 02/32/21 0.078/31 10,300,00 0.007% 59,000,00 67,91,37 0.016% 66,80,24 Carpiert Community Standum 02/32/21 0.078/31 10,000,00 0,007%	Adams Street Secondary II	12/31/08	12/31/20				30,000,000	3,179,205	0.03%	1,635,000
Adam Ster Verture Innovations Find 03/00/16 03/00/16 11/4.237.02 1.24% 5.12.04 Attrast Hartners Yi 07/28/23 77/28/23 50.0000 0 0.00% 50.00000 0 0.00% 50.00000 0 0.00% 50.00000 0 0.00% 50.00000 0 0.00% 50.00000 0 0.00% 50.00000 0 0.00% 50.00000 0 0.00% 50.00000 0 0.00% 6.8.8.9.9.9 BigAr Str Guty Hurdl 06/74/2 06/74/2 06/74/2 06/74/2 06/74/2 06/74/2 03.00000 0 0.00% 6.8.8.9.9 Correct Contining Standur 06/74/2 06/74/2 07/74/2 12 10.00000 7.0.107.5 0.6.2.9 6.6.83.13 Genata Cipial Interes X 02/71/2 01/71/2 07/71/2 12 10.00000 7.0.107.9 12 12.9.2.2 10.00000 7.0.107.9.5 0.6.2.9 6.6.83.13 Genata Cipial Interes X 02/71/2 07/71/2 12/71/2 12 12.0.0000	Adams Street Secondary V	10/31/12	10/31/22				40,000,000	8,334,093	0.07%	9,154,125
At Industri Parthers Fund III 09/18/18 09/18/18 09/18/18 09/18/18 09/18/18 09/18/18 09/18/18 09/18/18 09/18/18 09/18/18 09/18/18 00/08/18	Adams Street Venture Innovation Fund	03/09/16	03/09/28				75,000,000	144,237,972	1.24%	5,719,749
Alter is defining types v1 07/28/23 07/28/23 07/28/23 07/28/23 07/28/23 07/28/23 07/28/23 07/28/23 07/28/23 07/28/23 0.000 0.0000 0 0.0000	AE Industrial Partners Fund II	05/18/18	05/18/28				35,000,000	43,712,692	0.38%	5,934,894
Abar investments VI 07/01/28 07/01/28 07/01/28 07/01/28 07/01/28 07/01/28 07/01/28 07/01/28 000000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.0000 0 0.00000 0 0.00000 0 0.00000 0 0.00000 0 0.00000 0 0.00000 0 0.00000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000 0 0.000000	Altaris Health Partners VI	07/28/23	07/28/33				50,000,000	0	0.00%	50,000,000
By Are Signify Fund II Op/AP/IN 22/31/14 Car 21R U ^{II} 22/31/2017 10.000,000 0 0 0.00% BlackTrin Francial Services Fund IV 06/21/31 06/21/31 06/21/31 01000,000 0 000% Encore Francian Services Fund IV 06/21/31 06/21/31 0000,00 0 000% Encore Fund III 06/21/31 06/21/31 06/21/31 0.00% 64.86.01 Central Cightal Partners IX 02/14/31 02/14/32 02/14/32 0.0000,00 72.02.75 0.81% 62.24.34 Central Cightal Partners X 02/14/31 02/14/32 04/25/33 0.44 50.000,00 72.25.75 0.41% 85.20.00 Central Cightal Partners X 02/12/21 01/12/33 0.40% 85.20.00 12.83.15 0.41% 85.20.00 Central Cightal Partners X 02/12/23 01/12/33 0.40% 85.20.00 10.000.00 10.000.00 10.000.00 10.000.00 10.000.00 10.000.00 10.000.00 10.000.00 10.000.00 10.000.00	Arbor Investments VI	07/01/24	07/01/34				50,000,000	0	0.00%	50,000,000
Bity Are Digity Fundi (27)71/9 (27)71/9 (27)71/9 (27)71/9 (27)72.8 (2.1.6) Experime Community Sand'and 10/11/0 10/11/0 10/11/0 10/11/0 4,580.55 10.000,000 20.025.8 4,580.55 EQT Kurdi 00/21/0 10/11/0 10/11/0 10/11/0 10.000,000 20.035.46 0.026.8 4,580.55 EQT K 11/11/12 11/11/32 10.000,000 29.335.45 0.058 6,221.44 Sensar Coputal Partners X 04/01/12 04/01/23 10.000,000 29.337.85 0.088 6,322.18 CGTG XW 10/27/20 12/11/23 10.000,000 29.337.85 0.088 6,322.18 CGTG XW 10/27/20 12/11/23 10.000,000 12.83.13 0.11% 9,422.23 Lettina Ar indrama Captal Partners X 05/10/21 0.000,00 12.83.13 0.000 0.0000 10.000,000 12.83.13 0.005 10.000,000 12.83.13 0.005 10.000,000 12.83.13 0.005 5.07.40 6.000,000 12.83.11 <td>Bay Area Equity Fund</td> <td>06/14/04</td> <td>12/31/14</td> <td>2nd 2 YR</td> <td>LP</td> <td>12/31/2017</td> <td>10,000,000</td> <td>0</td> <td>0.00%</td> <td>C</td>	Bay Area Equity Fund	06/14/04	12/31/14	2nd 2 YR	LP	12/31/2017	10,000,000	0	0.00%	C
BlackTin Immanda Services Fund IV 006/24/24 06/24/24 06/24/24 06/24/24 06/24/24 06/24/24 06/25/34	Bay Area Equity Fund II	2/29/09	12/31/19				10,000,000	18,672,728	0.16%	C
Carpener Community Benchand 1033100 1033100 9000000 0 0.00% EVT Yundiin 667526 657526 5382573 4.414.11 0.005,000 70,7027 6,515,45 6,635,13 EVT Xu 11/17/22 11/17/22 11/17/23 5,016,000 70,7027 6,515,46 6,325,45 6,334,45 6,235,4 6,334,35 6,324,35 6,334,35 6,324,34 6,342,13 6,334,34 6,324,34 6,342,13 6,344,30 6,344,33 6,344,33 6,344,30 6,344,31 0,446,43 3,300,00 6,314,31 0,456,31 3,344,43 0,346,43 3,300,00 6,314,31 1,344,31	BlackFin Financial Services Fund IV	06/24/24	06/24/34				53,933,343	4,769,024	0.04%	48,680,541
EPC Fund II Ø6/25/24 Ø6/25/26 S35.86,7.81 4.44.18.11 0.04% 68,67.13 Cernitar Capital Partners X 07/18/79 07/18/79 50,000,000 70,710,77 0.61% 6,931.43 Genstar Capital Partners X 00/01/21 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 04/26.33 01/27.00 17.377,775 0.61% 6,93.44 GTSX XV 01/07/20 10/17/30 100,000,000 12.813.139 0.11% 89,540.24 GTSX XV 01/17/20 10/17/30 100,000,000 12.813.139 0.11% 89,540.24 GTSX XV 01/12/2 01/12/2 01/12/2 01/12/2 0.37% 12.919.23 Lenand Steren Screet	Carpenter Community BancFund	10/31/09	10/31/19				30,000,000	0	0.00%	(
EQT X 11/1/7/2 11/1/7/2 0 00000000 29.458,058 0.25% 66.86.31 Central Capital Partners X 04/01/21 04/01/21 04/01/21 40/01/21	EPIC Fund III	06/25/24	06/25/34				53,862,718	4,441,811	0.04%	48,678,167
Gendar Capital Partners X OP/18/39 OP/18/39 S0000000 70,710,727 0.61% 6,974 Gendar Capital Partners X OP(1021 04/021	EQT X	11/17/22	11/17/32				100,000,000	29,435,456	0.25%	66,483,130
Censtar Capital Partners X 04//11/1 04//17/1 04//17/1 42,00,000 44,06,453 0.38% 53,272.3 Censtar Capital Partners X 10//27/0 12/31/3 5 5000,000 74,257,59 0.41% 94,263.0 94,263.0 94,263.0 94,263.0 94,263.0 94,263.0 94,263.0 94,263.0 93,87.025 0.01% 94,203.0 94,213.2 0.01% 94,203.0 94,213.2 0.01% 94,203.0 94,213.2 0.01% 94,203.0 97,213.3 0.11% 94,233.0 97,753 0.01% 94,203.0 97,753 0.01% 94,203.0 97,753 0.01% 94,203.0 97,753 0.01% 94,203.0 97,753 0.01% 94,203.0 97,753 0.01% 94,203.0 97,753 0.01% 97,753 0.11% 97,753 0.11% 97,753 0.11% 97,753 0.11% 97,753 0.11% 97,753 0.11% 97,753 0.11% 97,753 0.10% 97,753 0.11% 97,753 0.11% 97,753 0.00% 0.0	Genstar Capital Partners IX	02/18/19	02/18/29				50,000,000	70,710,275	0.61%	6,291,443
Censtar Capital Partners Xi 04//6/3 04//6/3 04//6/3 5 5 0.08% 66.324.13 GTCR XIII 10//27/0 01/12/02 01/17/03 100,000,000 12,213,139 0.11% 85,632.01 Helman & Friedman Capital Partners Xi 01/12/02 01/17/03 100,000,000 12,813,139 0.11% 85,570.00 Lenard Green - Green Capital Partners Xi 03/01/12 02/28/32 0.0000 0.0000,000 0.000% 20,000.00 0.000% 20,833,000 63,843,670 0.00% 28,839,83 0.05% 49,770,40 0.0000,000 0.01% 40,000,000 21,813,13 0.01% 63,883,070 0.06% 28,839,83 0.05% 42,839,83 0.05% 42,839,83 0.05% 42,839,83 0.05% 42,839,83 0.05% 42,839,83 0.05% 43,83,80 0.05% 43,83,80 0.05% 43,83,80 0.05% 43,83,80 0.05% 43,83,80 0.05% 43,83,80 0.05% 43,83,80 0.05% 43,83,80 0.05% 43,83,80 0.05% 43,83,80	Genstar Capital Partners X	04/01/21	04/01/31				42,500,000	44,306,453	0.38%	3,427,332
CTCR XII 107/270 12/3/3/6 9,42/2 GTCR XIV 01/12/23 01/12/33 10,000,000 12,813,133 0.11% 89,520,00 Hellman & Friedman Capital Partners X 02/12/22 12/16/22 12/16/22 10,000,000 0 0.00% 10,000,000 0 0.00% 10,000,000 0 0.00% 10,000,000 0 0.00% 10,000,000 0 0.00% 10,000,000 0 0.00% 10,000,000 0 0.00% 10,000,000 0 0.00% 10,000,000 0 0.00% 10,000,000 0 0.00% 0 0.00% 10,000,000 0 28,232.33 0.00% 6,841,230 0.00% 6,841,230 0.00% 6,841,230 0.00% 6,842,24 0.00% 0 0.00% 0 28,232.33 0.00% 6,842,24 0.00% 0.00% 0 0.00% 0 0.00% 0 0.00% 0 0.00% 0 0.00% 0 0.00% 0 0.00% 0 0.00% 0	Genstar Capital Partners XI	04/26/23	04/26/33				75,000,000	9,387,925	0.08%	66,324,18
GTCX NV Q1/2/22 Q1/1/2/23 Q1/1/2/23 Q1/1/2/23 Q1/1/2/23 Q1/1/27/23 Q5/1/2/13 Q	GTCR XIII	10/27/20	12/31/36				50,000,000	47,257,579	0.41%	9,642,24
Hellmans & Friedmans Capital Partners X D5/U/21 D5/U/21 <thd5 21<="" th="" u=""> D5/U/21 D5/U/21</thd5>	GTCR XIV	01/12/23	01/12/33				100,000,000	12,813,139	0.11%	89,520,000
Hellman & Friedman Capital Partners XI 12/16/22 12/16/32 12/16/32 100.000.00 0 0 0.00% 100.000.00 Leonard Green - Green Faulty Investors IX 03/01/22 02/28/32 60.000,000 63.105.763 0.30% 22.3233 Daktice Private Investment Fund 2009 02/28/10 12/15/19 40.000,000 61.1382 0.05% 5.305.076 Ocean Avenue Fund II 05/07/14 05/07/24 30.000.000 33.101.77 0.21% 3.000.000 Pathway 11/09/15 12/09/75 50.000,000 1.31.77 0.01% 10.326.77 Pathway 11/09/86 05/31/11 12/26/08 12/26/23 30.000.000 1.675.142 0.07% 5.23.75 Pathway 2008 12/26/08 12/26/08 12/26/23 30.000.000 1.675.142 0.07% 5.13.75 Pathway 7 02/07/13 02/07/13 02/07/13 02/07/13 02/07/13 02/07/13 02/07/13 02/07/13 02/07/13 02/07% 0.00% 5.03.750 0.49% 5.19.750 0.49% 5.19.750 0.49% 5.19.275 0.00% 5.00.00,00 0.00% </td <td>Hellman & Friedman Capital Partners X</td> <td>05/10/21</td> <td>05/10/31</td> <td></td> <td></td> <td></td> <td>75.000.000</td> <td>65.841.893</td> <td>0.57%</td> <td>15.191.99</td>	Hellman & Friedman Capital Partners X	05/10/21	05/10/31				75.000.000	65.841.893	0.57%	15.191.99
Leonard Green - Green Equity Investors IX 03/01/22 02/28/32 Iso 60,000,000 35,106,763 0.30% 28,329,38 Leonard Green - Jade Equity Investors II 03/01/22 02/28/32 Iso,000,000 55,106,763 0.30% 29,329,38 Decan Avenue Fund II 05/07/14 05/07/14 05/07/14 05/07/14 03,000,000 13,801,197 0.12% 3,000,000 Ocean Avenue Fund II 05/07/14 05/07/14 05/07/14 05/07/14 3,000,000 13,801,197 0.12% 3,000,000 Patamay 11/09/96 05/31/21 12/5,000,000 1,765,177 0.01% 13,822,60 0.07% 2,537,06 Pathway 506 05/74/11 05/94/76 40,000,000 15,67,750 0.49% 3,305,00 Pathway 6 05/74/11 05/94/76 40,000,000 66,883,52 0.58% 28,137,50 Siguler Guff Sceandary Oportunities 06/03/14 05/31/23 20,000,000 66,883,52 0.58% 28,137,50 Siguler Guff Sceandary Oportunities 01/31/16 11/31/16 12/3	Hellman & Friedman Capital Partners XI	12/16/22	12/16/32				100.000.000	0	0.00%	100.000.000
Leonard Green - Jade Equity Investors II 93/01/22 02/28/32 1 15,000,000 6,117,832 0.05% 9470,49 Oaktree Private Investment Fund 2009 02/28/10 17/15/19 1 40,000,000 129,131 0.00% 6,308,56 Ocean Avenue Fund II 12/09/25 1 30,000,000 51,675,142 0.45% 35,000,000 51,675,142 0.45% 35,000,000 51,675,142 0.45% 35,000,000 51,675,142 0.45% 35,000,000 12,67,17 0.01% 10,325,77 0.01% 10,325,77 0.01% 10,325,77 0.01% 10,325,77 0.01% 10,325,77 0.01% 10,325,77 0.01% 10,325,77 0.01% 10,325,77 0.01% 10,325,77 0.00% 51,937,90 30,000,000 46,672,587 0.40% 51,937,90 30,000,000 46,672,587 0.40% 51,937,90 35,942,600 0.00% 10,351,40,40,40,44 51,937,90 35,942,600 0.38,42,260 0.33% 4,090,49 35,000,000 48,642,512 0.23% 28,917,90 35,942,500 0.38,42	Leonard Green - Green Equity Investors IX	03/01/22	02/28/32				60.000.000	35.106.763	0.30%	28.329.388
Osktree Private Investment Fund 2009 02/28/10 12/15/19 40,000,000 291,317 0.00% 6,308,96 Ocean Avenue Fund II 05/07/14 05/07/14 30,000,000 13,801,197 0.12% 30,000,000 Ocean Avenue Fund II 06/07/14 05/07/14 50,000,000 13,801,197 0.12% 30,000,000 Patkeni III 08/15/08 08/15/18 52,000,000 4,313,310 0.04% 33,748 Patkway 11/20/918 05/21/21 12.5000,000 1,266,177 0.01% 10,325,70 Pathway 2008 12/25/08 12/25/08 12/25/08 12/32,670 10,325,70 Pathway 6 05/24/11 05/24/26 40,000,000 19,81,816 0.16% 3,425,34 Siguler Guff Scondary Opportunities 06/03/14 05/13/25 50,000,000 0 0.00% Siguler Guff Scondary Opportunities 12/21/16 12/32/16 12/32/26 0.30% 4,009,49 Siguler Guff Scondary Opportunities 12/32/16 12/32/26 0.40% 43,37,33 Siguler Gu	Leonard Green - Jade Equity Investors II	03/01/22	02/28/32				15.000.000	6.117.832	0.05%	9,470,490
Ocean Avenue Fund III 05/07/14 05/07/24 30,000,000 13,801,197 0.12% 3,000,000 Ocean Avenue Fund III 12/09/15 12/09/25 50,000,000 51,675,142 0.45% 35,000,00 Pathway 11/09/98 06/31/21 125,000,000 12,66(,177 0.01% 10.326,70 Pathway 2008 12/26/08 12/67/24 430,000,000 8,574,260 0.07% 2,537,06 Pathway 7008 05/07/14 05/07/13 10/07/73 400,00,000 19,081,361 0.16% 34,252,34 Pathway 6 05/07/14 05/07/12 02/07/13 07/07/73 40,00,000 19,081,361 0.16% 34,252,34 Pathway 7 02/07/13 07/07/73 20,000,000 66,689,392 0.49% 3050,49 Siguler Guff Sceendary Opportunities 12/31/16 12/31/26 20,000,000 66,089,392 0.33% 4,090,49 Siguler Guff Sceendary Opportunities 05/27/21 05/27/21 0,000,000 9,007% 1 2,593,061,073 0,033% 4,043,77,03 1,	Oaktree Private Investment Fund 2009	02/28/10	12/15/19				40.000.000	291.317	0.00%	6.308.961
Ocean Avenue Fund III 12/09/15 2/09/25 2/09/25 2/00/20 3/00/20 Palatini III 08/15/08 08/15/18 2/00/00 4/319/310 0.04% 3/37,08 Pathway 11/09/95 01/21/27 12/26/08 2/00/00 4/319/310 0.04% 3/37,08 Pathway 2008 12/26/08 12/26/23 3/00/00 8/57,250 0.07% 2/237,06 Pathway 6 05/24/11 05/24/26 4/0,000,000 19,081,361 0.16% 3/425,34 Pathway 6 05/24/12 5/0,000,000 46.672,587 0.40% 5/13,79 Pathway 7 02/07/13 02/07/13 02/07/13 02/000,000 66.689,532 0.58% 28,197,00 Siguler Guff Secondary Opportunities 06/3/14 05/31/25 50,000,000 0 0.00% 51.677,51 0.40% 43.377,03 Siguler Guff Secondary Opportunities 06/3/21 05/3/21 30,000,000 4.80,61,185 0.42% 2.8370,00 Symphony Technology Group VII 02/21/21 05/27/21 05/2	Ocean Avenue Fund II	05/07/14	05/07/24				30,000,000	13 801 197	0.12%	3 000 000
Patadin III 08/15/08 08/15/18 Description 25,000,000 4,319,310 0.04% 337,48 Pathway 11/09/98 05/31/21 12/5000,000 1,2/56,177 0.01% 10.325,707 Pathway 008 12/2/608 12/2/5/33 40,000,000 8,574,26 0.07% 2.537,06 Pathway 008 05/24/11 05/24/26 40,000,000 8,574,26 0.07% 2.537,06 Pathway 7 02/07/13 02/07/13 70,000,000 46,672,587 0.40% 5,193,79 Siguler Guff Secondary Opportunities 12/3/16 02/07/13 50,000,000 0 0.00% 38,422,540 0.33% 4,090,49 38,050,49 38,050,49 38,050,49 38,050,49 38,050,49 38,050,49 38,050,49 38,050,49 38,050,49 38,050,49 38,042,52 38,04,94 38,78,8 38,042,52 38,04,94 38,78,8 38,042,52 38,04,94 38,78,8 38,050,00 38,042,52 38,04,94 38,78,85 38,04,94 38,78,85 38,042,55 38,04,94 38,78,85 <td>Ocean Avenue Fund III</td> <td>12/09/15</td> <td>12/09/25</td> <td></td> <td></td> <td></td> <td>50,000,000</td> <td>51.675.142</td> <td>0.45%</td> <td>3,500,000</td>	Ocean Avenue Fund III	12/09/15	12/09/25				50,000,000	51.675.142	0.45%	3,500,000
Patiway 11/09/98 05/31/21 125/00/00 12/26/17 0.01% 103/26/17 Patiway 2008 12/26/08 12/26/08 12/26/08 30.000,000 8,574,260 0.07% 2,537,60 Patiway 6 05/24/11 05/24/26 40.000,000 19,081,361 0.16% 3,425,34 Patiway 7 02/07/13 02/07/23 50,000,000 46,672,587 0.40% 3,050,49 Sigular Guff CCERA Opportunities 06/03/14 05/31/25 50,000,000 66,889,532 0.85% 28,197,50 Sigular Guff CCERA Opportunities 12/31/16 12/31/26 0.00% 0.00% 0.00% Sing Partners W 05/18/18 05/18/28 35,000,000 43,805,43 0.00% 43,877,03 TA XV 05/27/21 05/27/31 50,000,000 43,861,185 0.42% 2,875,00 TPG Heathcare Partners I 06/30/22 06/30/32 60,000,00 27,622,882 0.23% 42,980,87 TPG Heathcare Partners IX 06/30/22 06/30/32 65,000,000 34,33,102	Paladin III	08/15/08	08/15/18				25,000,000	4,319,310	0.04%	387,482
Johnson Pathway 2008 12/26/08 12/26/08 12/26/22 12/26/22 30,000,000 4,574,26 0.07% 2,537,456 Pathway 6 05/24/11 05/24/11 05/24/12 40,000,000 19,081,361 0.16% 34,25,34 Pathway 7 02/07/13 02/07/13 02/07/13 70,000,000 46,672,587 0.40% 51,93,79 Siguler Guff Scondary Opportunities 12/31/16 12/31/26 200,000,000 66,889,532 0.58% 28,97,50 Siguler Guff Scondary Opportunities 12/31/16 50,000,000 43,00,543 0.04% 43,377,03 Siguler Guff Scondary Opportunities 12/21/12 12/21/12 22,217,06 0.03% 4,009,49 Symphony Technology Group VII 12/21/22 12/21/12 12/21/12 22,827,06 0.33% 4,009,49 Symphony Technology Group VII 12/21/22 12/21/21 12/21/22 22,827,00 0.24% 43,377,03 TA XV 05/32/21 06/30/22 06/30/32 06/30/32 06/30/32 06/30/32 0.03% 42,825,70	Pathway	11/09/98	05/31/21				125,000,000	1 266 177	0.01%	10 326 704
Norm Description Descretion <thdescription< th=""> <thdes< td=""><td>Pathway 2008</td><td>12/26/08</td><td>12/26/23</td><td></td><td></td><td></td><td>30,000,000</td><td>8 574 260</td><td>0.07%</td><td>2 537 062</td></thdes<></thdescription<>	Pathway 2008	12/26/08	12/26/23				30,000,000	8 574 260	0.07%	2 537 062
Instruction of a constraint of constraint of a	Pathway 6	05/24/11	05/24/26				40,000,000	19 081 361	0.16%	3 425 343
Table of the stress o	Pathway 7	03/24/11	02/07/23					46 672 587	0.40%	5,425,545
Tailing 0 11/20/12 11/20/12 11/20/12 01/20/12 <t< td=""><td>Pathway 8</td><td>11/23/15</td><td>11/23/25</td><td></td><td></td><td></td><td>50,000,000</td><td>56 677 502</td><td>0.49%</td><td>3 050 496</td></t<>	Pathway 8	11/23/15	11/23/25				50,000,000	56 677 502	0.49%	3 050 496
Siguer Guif Secondary Opportunities 12/31/16 12/31/16 12/31/16 12/31/16 12/31/16 12/31/16 12/31/16 12/31/16 12/31/16 12/31/16 13/31/31/31 13/31/31 13/31/31	Sigular Guff CCCERA Opportunities	06/03/14	05/31/25				200,000,000	66 889 532	0.58%	28 197 500
Agend out account of Opportainties in the state of t	Sigular Guff Secondary Opportunities	12/31/16	12/31/25				50,000,000	00,005,552	0.00%	20,157,500
All or all differs 03/10/10/10 03/10/10 03/10/10 </td <td>Siris Partners IV</td> <td>05/18/18</td> <td>05/18/28</td> <td></td> <td></td> <td></td> <td>35,000,000</td> <td>38 542 560</td> <td>0.33%</td> <td>1 000 100</td>	Siris Partners IV	05/18/18	05/18/28				35,000,000	38 542 560	0.33%	1 000 100
Aying hold Yield Nill 12/21/2	Symphony Technology Group VII	12/21/22	12/21/22				50,000,000	4 300 543	0.04%	4,050,450
IA AV 00/21/12 00/21/21 00/21/21 00		05/27/21	05/27/21				50,000,000	4,500,545	0.42%	2 875 000
TAX 03/30/23 03/3		03/21/21	03/27/31				90,000,000	48,801,185	0.42%	2,873,000
TPG Healthcate Partners II 00/2/15 00/2/15 06/30/32 0.33% 33/671,30 Trident VIII, L.P. 05/24/19 05/24/19 05/24/29 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 09/17/31 00/30% 01/30/3 0.33% 16,802,98 Total Private Equity Total: Private Equity 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 11/30/13 1/30/13 00/32,3843 0.00% 1/021,400 Aether Real Assets III Surplus, L.P. 11/30/13 11/30/13 11/30/12 10/101/12 50	TRC Healthcare Partners L P	05/30/23	05/31/33				30,000,000	3,732,301	0.08%	2 090 97
TPG Partners IX 06/30/22 06/30/32 06/30/32 06/30/32 06/30/32 06/30/32 06/30/32 06/30/32 033% 30,671,30 033% 30,671,30 06/30/22 06/30/32 09/17/21 01/01/28 0.00% 0.00% 0.00% 01/01/28 0.00% 01/01/28 0.00% 01/01/28 0.00% 0/10/17/28 0.00% 0/10/17/28 0.00% 0/10/17/28 0.00% 0.00% 0/10/17/28 0.00% 0.00% 0/10/16 0.00% 0/10/17/28 0.00% 0.00% 0/10/17/28		06/27/19	06/27/29				24,000,000	20,272,032	0.23%	2,900,070
Inception Target # of Discretion New Target Funding Market % of Outstanding Acther III & III Surplus 11/30/13 11/30/13 11/30/20 50,000,000 323,843 0.00% 49,798,645 0.43% 4,425,72 Real Assets/Infrastructure Inception Target # of Discretion New Target Funding Market % of Outstanding Acther III & III Surplus 11/30/13 11/30/20 Int/30/20 Int/30/20 75,000,000 323,843 0.00% 1,021,400 Acther Real Assets III Surplus, L.P. 01/01/16 01/01/18 Int/30/20 Int/30/20 Int/20,000,000 46,125,926 0.40% 5,475,800 Acther Real Assets III Surplus, L.P. 06/14/24 06/14/34 Int/30/20 Int/30/20 Int/2,94 50,000,000 323,843 0.00% 1,021,400 Acther Real Assets III LP 01/01/16 01/01/18 01/01/18 01/01/18 01/01/28 Int/2,94 50,000,000 323,843 0.00% 1,22,94 Acther Real Assets III, LP 01/01/16 01/01/128 Int/2,94 50,000,000		06/30/22	06/30/32				60,000,000	27,042,785	0.24%	34,759,370
Indent VII, L.P. 05/24/19 05/24/29 05/24/29 05/24/29 06/24/29 06/24/29 07/21 09/17/21 03/26 0.37% 16,802,98 Total Private Equity Inception Target Termination # of Discretion by GP/LP New Target Termination Funding Commitment Value Yale Outstanding Commitment Acther III & III Surplus, L.P. 11/30/13 11/30/20 Inception Target Termination # of Discretion by GP/LP Total Assets III, LP Sol 000		06/30/22	06/30/32				65,000,000	38,433,102	0.33%	30,671,303
Indentity, L.P. 09/1//21 09/1//21 09/1//31 S5,000,000 42,729,075 0.37% 16,802,98 Total: Private Equity 2,593,861,674 1,194,838,952 10.30% 915,515,600 Real Assets/Infrastructure Inception Target # of Discretion New Target Funding Market % of Outstanding Aether III & III Surplus 11/30/13 11/30/20 Factorian S5,000,000 323,843 0.00% 1,021,400 Aether Real Assets III Surplus, L.P. 11/30/16 01/01/16 01/01/28 Image: Common and the second and t		05/24/19	05/24/29				40,000,000	49,798,645	0.43%	4,425,725
Inception Target # of Discretion New Target Funding Market % of Outstanding Aether III & III Surplus 11/30/13 11/30/20 Extension by GP/LP Termination 75,000,000 323,843 0.00% 1,021,400 Aether Real Assets III Surplus, L.P. 11/30/13 11/30/20 Funding 75,000,000 323,843 0.00% 1,021,400 Aether Real Assets III Surplus, L.P. 01/01/16 01/01/28 Funding 75,000,000 323,843 0.00% 1,021,400 Aether Real Assets III, LP 01/01/16 01/01/28 Funding 75,000,000 323,843 0.00% 712,94 Altor ACT I 06/14/24 06/14/24 06/14/34 Funding 68,766,132 1,381,917 0.01% 63,434,488 Commonfund Capital Natural Resources IX 06/30/13 06/30/20 Funding 50,000,000 29,483,467 0.25% 2,050,000		09/1//21	09/1//31				50,000,000	42,729,075	0.37%	16,802,984
Real Assets/InfrastructureInceptionTarget# ofDiscretionNew TargetFundingMarket% ofOutstandingDateTerminationExtensionby GP/LPTerminationCommitmentValueTotal AssetCommitmentAether III & III Surplus11/30/1311/30/20Inception	Total: Private Equity						2,593,861,674	1,194,838,952	10.30%	915,515,609
DateTerminationExtensionby GP/LPTerminationCommitmentValueTotal AssetCommitmentAether III & III Surplus11/30/1311/30/2311/30/2075,000,000323,8430.00%1,021,400Aether Real Assets III Surplus, L.P.50,000,000323,8430.00%1,021,400Aether Real Assets III, LP50,000,000323,8430.00%712,944Aether IV01/01/1601/01/2850,000,00046,125,9260.40%54,75,800Altor ACT I06/14/2406/14/2406/14/3468,766,1321,381,9170.01%63,434,488Commonfund Capital Natural Resources IX06/30/1306/30/2050,000,00091,560.00%EIF USPE II06/15/0506/15/153rd 1 YRLP06/15/1850,000,00091,560.00%	Real Assets/Infrastructure	Inception	Target	# of	Discretion	New Target	Funding	Market	% of	Outstanding
Aether III & III Surplus 11/30/13 11/30/20 75,000,000 323,843 0.00% 1,021,400 Aether Real Assets III Surplus, L.P. 50,000,000 323,843 0.00% 308,460 Aether Real Assets III, LP 01/01/16 01/01/28 01/01/28 00/000 0 712,940 Aether IV 01/01/16 01/01/28 50,000,000 46,125,926 0.40% 5,475,800 Altor ACT I 06/14/24 06/14/34 68,766,132 1,381,917 0.01% 63,434,488 Commonfund Capital Natural Resources IX 06/30/13 06/30/20 50,000,000 29,483,467 0.25% 2,050,000 EIF USPF II 06/15/05 06/15/15 3rd 1 YR I.P 06/15/18 50,000,000 9,156 0.00%		Date	Termination	Extension	by GP/LP	Termination	Commitment	Value	Total Asset	Commitment
Aether Real Assets III Surplus, L.P. Image: Constant of the system o	Aether III & III Surplus	11/30/13	11/30/20				75,000,000	323,843	0.00%	1,021,408
Aether Real Assets III, LP Image: Constraint of the sector of the se	Aether Real Assets III Surplus, L.P.						50,000,000	323,843		308,464
Aether IV 01/01/16 01/01/28 Image: Constraint of the second of the	Aether Real Assets III, LP						25,000,000	0		712,944
Altor ACT I 06/14/24 06/14/34 68,766,132 1,381,917 0.01% 63,434,489 Commonfund Capital Natural Resources IX 06/30/13 06/30/20 50,000,000 29,483,467 0.25% 2,050,000 EIF USPF II 06/15/05 06/15/15 3rd 1 YR LP 06/15/18 50,000,000 9,156 0.00%	Aether IV	01/01/16	01/01/28				50,000,000	46,125,926	0.40%	5,475,801
Commonfund Capital Natural Resources IX 06/30/13 06/30/20 50,000,000 29,483,467 0.25% 2,050,000 EIF USPE II 06/15/05 06/15/15 3rd 1 YR I.P 06/15/18 50,000,000 9,156 0,00%	Altor ACT I	06/14/24	06/14/34				68,766,132	1,381,917	0.01%	63,434,489
EIF USPE II 06/15/15 3rd 1 YR I P 06/15/18 50 000 000 9 156 0 00%	Commonfund Capital Natural Resources IX	06/30/13	06/30/20				50,000.000	29,483.467	0.25%	2,050.007
	EIF USPF II	06/15/05	06/15/15	3rd 1 YR	LP	06/15/18	50,000,000	9,156	0.00%	0

Inception	Target	# of	Discretion	New Target	Funding	Market	%
Date	Termination	Extension	by GP/LP	Termination	Commitment	Value	Tota
11/30/13	11/30/20				75,000,000	323,843	0.
					50,000,000	323,843	
					25,000,000	0	
01/01/16	01/01/28				50,000,000	46,125,926	0.
06/14/24	06/14/34				68,766,132	1,381,917	0.
06/30/13	06/30/20				50,000,000	29,483,467	0.
06/15/05	06/15/15	3rd 1 YR	LP	06/15/18	50,000,000	9,156	0.

EIF USPF III	02/28/07	02/28/17	1st 1 YR	LP	02/28/18	65,000,000	37,629	0.00%	0
EIF USPF IV	06/28/10	06/28/20				50,000,000	22,301,271	0.19%	4
Ares EIF V	09/09/15	11/19/25				50,000,000	21,053,389	0.18%	3,888,697
EQT Infrastructure	11/15/23	11/15/35				125,000,000	31,749,238	0.27%	86,983,780
Wastewater Opportunity Fund	12/31/15	11/30/22				25,000,000	573,042	0.00%	521,541
Totall: Real Assets/Infrastructure					608,766,132	153,038,878	1.32%	163,375,727	
Total: Private Equity and Real Assets/Infrastructure					3,202,627,806	1,347,877,830	11.62%	1,078,891,336	
Outstanding Commitments				_	1,078,891,336				
Total			2,426,769,166						

Market value equals the most recent reported net asset value, plus capital calls after net asset value date, less distributions after net asset value date. The Target Termination column is the beginning of liquidation of the fund, however, some funds may be extended for an additional two or three years.

Contra Costa County Employees' Retirement Association

Actuarial Experience Study

Analysis for the period from January 1, 2021 through December 31, 2023



May 7, 2025 / Todd Tauzer / Andy Yeung / Eva Yum

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Actuarial Experience Study Overview Summary of Recommendations Actuarial Cost Impact Taking a Closer Look

Actuarial Experience Study Overview



Actuarial Experience Study Overview *Why do we need experience studies?*

Develop recommended assumptions for annual actuarial valuation

- Reviews economic and demographic assumptions every three years
- Current study is based on the three-year period from 2021-2023
 - Various assumptions include experience from prior studies to increase the "credibility"

Segal's role is to make appropriate recommendations to the Board

- Recommendations follow guidance of Actuarial Standards of Practice
 - Assumptions are reasonable individually and in aggregate (ASOP No. 27)

Purpose of the Actuarial Assumptions *What do the assumptions do?*



How will assets grow?

How will salaries and benefits increase?

How will UAAL be amortized?

What type of benefits will be paid? When will benefits be paid and how long?



Actuaries make assumptions as to when and how a member will leave active service and estimate the amount, duration and present value of the expected benefits paid.

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Role of Actuarial Assumptions and Methods

C + I = B + E <u>C</u>ontributions + Investment Income equals <u>B</u>enefit Payments + Expenses

 Assumptions do not directly affect the payment of benefits, only the timing of contributions

- Actuarial valuation determines the "current" cost, not the ultimate cost

Summary of Recommendations



Summary of Economic Assumptions



Assumption	Recommendation
Inflation	 Maintain current assumption of 2.50%
Cost-of-Living Adjustments (COLA)	 Maintain current assumptions of 2.75% (for tiers with a 3% or 4% max COLA) and 2.00% (for tiers with a 2% max COLA) 2.75% assumption reflects 0.25% margin above recommended inflation assumption
Investment Return	 Maintain current assumption of 6.75% New model to calculate assumption based on geometric average return
Salary Increase	 Maintain current inflation assumption of 2.50% Maintain current "across-the-board" salary assumption of 0.50% Introduce separate assumptions for Legacy and PEPRA Tiers Increase merit & promotion salary assumptions to reflect higher salary increases overall
Payroll Growth	 Maintain current assumption of 3.00%
Administrative Expenses	 Maintain current administrative expense load assumption to be based on actual administrative expenses and payroll for the prior year



Summary of Demographic Assumptions *Rates of decrement*

Assumption	Recommendation
Mortality	 Adopt new Pub-2016 base tables Adopt new adjustments to base tables to reflect CCCERA experience Maintain latest MP-2021 projection scale
Disability	 Reduce rates to reflect lower overall disability incidence
Termination	 Adjust rates to reflect higher overall termination experience for General and lower overall termination experience for Safety
Retirement	 Reduce rates to reflect lower overall retirement experience for all General members Reduce rates to reflect lower overall retirement experience for Legacy Safety enhanced members Increase rates to reflect higher overall retirement experience for Legacy Safety non-enhanced members and PEPRA Safety members



Summary of Demographic Assumptions *Miscellaneous assumptions*

Assumption	Recommendation
Deferred Vested Retirement Age	 Increase assumption from 60 to 61 for General members with reciprocity Maintain current assumption of 60 for General members without reciprocity Maintain current assumption of 53 for Safety members with reciprocity Decrease assumption from 51 to 50 for Safety members without reciprocity
Reciprocity	 Reduce assumption from 40% to 20% of General members will have reciprocity Reduce assumption from 70% to 50% of Safety members will have reciprocity
Beneficiary Assumptions	 Increase assumption from 65% to 70% of males have an eligible survivor Increase assumption from 50% to 55% of females have an eligible survivor Maintain current age and gender of survivor assumptions
Active Death Optional Form Election	 Introduce new assumption for members without an eligible spouse/domestic partner beneficiary
Sick Leave Conversion	 Adjust assumption to reflect slightly higher/lower sick leave conversion based on General/Safety membership group
Leave Cashouts	 Adjust assumption to reflect slightly higher/lower leave cashouts based on Cost Group

Actuarial Cost Impact



Estimated Actuarial Impact Modeled as of December 31, 2023

• Actual cost impact will be reflected in the December 31, 2024 valuation

Component	Current Assumptions	Total Change	Proposed Assumptions
Employer normal cost rate	15.07%	-0.30%	14.77%
Employer UAAL rate	<u>13.48%</u>	<u>-0.24%</u>	<u>13.24%</u>
Total Employer rate	28.55%	-0.54%	28.01%
Total Member rate	12.13%	0.03%	12.16%
UAAL	\$1,115 M	-\$41 M	\$1,074 M
VVA funded ratio	91.0%	+0.3%	91.3%


Employer Contribution Rate Impact Modeled as of December 31, 2023 as % of payroll

	Current	Total	Proposed
Cost Group	Assumptions	Change	Assumptions
Cost Group #1	24.00%	-0.67%	23.33%
Cost Group #2	21.41%	-0.72%	20.69%
Cost Group #3	17.80%	-0.61%	17.19%
Cost Group #4	27.50%	-0.84%	26.66%
Cost Group #5	39.81%	-0.53%	39.28%
Cost Group #6	15.13%	-0.28%	14.85%
Cost Group #7	59.75%	+0.09%	59.84%
Cost Group #8	60.55%	-0.09%	60.46%
Cost Group #9	49.46%	+0.21%	49.67%
Cost Group #10	91.22%	-0.31%	90.91%
Cost Group #11	48.58%	+0.23%	48.81%
Cost Group #12	76.09%	+1.21%	77.30%
Total employer rate	28.55%	-0.54%	28.01%

Note: There is a decrease in employer rate caused by demographic assumption changes (including higher termination, lower disability and lower life expectancies for current payees) offset somewhat by change in merit and promotion salary assumptions.

Member Contribution Rate Impact

Modeled as of December 31, 2023 as % of payroll

	Current	Total	Proposed
Cost Group	Assumptions	Change	Assumptions
Cost Group #1	11.62%	0.00%	11.62%
Cost Group #2	10.68%	-0.06%	10.62%
Cost Group #3	11.55%	+0.05%	11.60%
Cost Group #4	11.71%	-0.03%	11.68%
Cost Group #5	11.85%	+0.02%	11.87%
Cost Group #6	13.23%	+0.02%	13.25%
Cost Group #7	18.66%	+0.44%	19.10%
Cost Group #8	17.60%	+0.39%	17.99%
Cost Group #9	17.06%	+0.17%	17.23%
Cost Group #10	18.19%	+0.42%	18.61%
Cost Group #11	17.46%	+0.38%	17.84%
Cost Group #12	16.54%	+0.35%	16.89%
Total employer rate	12.13%	+0.03%	12.16%

Note: There is an increase in member rate caused by change in merit and promotion salary assumptions. (Most of the demographic assumption changes have no impact on member rates.)

Taking a Closer Look...



Summary of Economic Assumptions What are the components of the economic assumptions?



Each component should be consistent across all economic assumptions

Historical Consumer Price Index (CPI) Price inflation historical review



Segal 17

Historical Inflation Forecasts

Price inflation comparisons



Segal 18

Price Inflation Assumption Looking forward

Future expectations

- Investment consultant survey average inflation is 2.47%
 - Verus: 2.20% annual inflation over 30 years
- Social Security Administration: 2.40% average CPI over 75 years
- Market implied forward inflation hovering between 2%-2.5%
- Public Plan Database: 2.50% median inflation assumption

Recommend maintaining annual inflation assumption at 2.50%



Moving from arithmetic to geometric returns

- Expected arithmetic returns
 - Expected to have no surplus or shortfall ("mean")
 - Investment management fees reduce expected return
 - Used in 2021 experience study
- Expected geometric returns
 - Equal likelihood of surplus or shortfall ("median")
 - Investment management fees do not reduce expected return
 - New! Used in 2024 experience study
- Differences offset to some degree, so results are generally comparable

Investment earnings assumption *Putting it all together*

Assumption Component	December 31, 2024 Geometric	December 31, 2024 Arithmetic	December 31, 2021 Adopted
Inflation	2.50%	2.50%	2.50%
Portfolio expected arithmetic real return	5.72%	5.72%	5.60%
Adjustment to expected geometric real return	(0.56)%	N/A	N/A
Expense adjustment	(0.05)%	(0.60)%	(0.60)%
Risk adjustment	(0.86)%	(0.87)%	(0.75)%
Total	6.75%	6.75%	6.75%
Confidence level	62%	62%	59%

Expense and Risk Adjustment

Investment expenses

- Recommend decreasing expense assumption from 0.60% to 0.05%
 - No longer reflects investment manager fees

Risk adjustment	Years Ending December 31	Investment Return	Risk Adjustment	Confidence Level
Increase in risk adjustment	2006 – 2008	7.80%	0.86%	60%
	2009 - 2011	7.75%	0.41%	55%
- Results in higher confidence level	2012 – 2014	7.25%	0.25%	53%
 Compares risk position over time 	2015 – 2017	7.00%	0.30%	54%
	2018 – 2020	7.00%	0.61%	59%
	2021 – 2023	6.75%	0.75%	59%
	2024 (Recommended)	6.75%	0.86%	62%

Segal 22

Comparison with Other Systems *How does the 6.75% recommendation compare?*

- National median is 7.00%
 - 221 large public retirement funds in their 2023 fiscal year valuation
 - State systems outside California tend to lag emerging practices
- In California most common return assumption is 6.75% or lower

System(s)	Assumption	Count
CalPERS	6.80%	
CalSTRS	7.00%	
University of California	6.75%	
1937 CERL Systems	7.25%	1
	7.00%	6
	6.75%	9
	6.50%	3
	6.25%	1
San Francisco	7.20%	
LACERS, LAFPP	7.00%	
LADWP	6.50%	
Fresno City	6.75%	
San Jose	6.625%	
San Diego City	6.50%	

Segal 23

Merit and Promotion Increase Example Legacy General Members



Retirement Increase Example

General Tier 3 Enhanced Members



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25

Note: Results may not add due to rounding.

Active Death Optional Form Election % *Optional Settlement 2 Election*

- Currently, assume only members who are married or have a domestic partner would make this advance election to provide a continuance of 100% upon the member's active death
- Introduce a new active death optional form election assumption for members who are assumed to be not married at pre-retirement death:

Beneficiary Type	Observed Percentage	Proposed Percentage Assumption	Proposed Age Difference with Active Member
Child	30%	30%	30 years younger
Parent	32%	30%	30 years older
Sibling and other	38%	40%	Same age

Thank You

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Contra Costa County Employees' Retirement Association

Actuarial Experience Study

Analysis of Actuarial Experience During the Period January 1, 2021 through December 31, 2023

This report should only be copied, reproduced, or shared with other parties in its entirety as necessary for the proper administration of the Plan.





April 30, 2025

Board of Retirement Contra Costa County Employees' Retirement Association 1200 Concord Avenue, Suite 300 Concord, CA 94520

Re: Review of Actuarial Assumptions for the December 31, 2024 Actuarial Valuation

Dear Members of the Board:

We are pleased to submit this report of our review of the actuarial experience for the Contra Costa County Employees' Retirement Association (CCCERA). This study utilizes the census data for the period January 1, 2021 through December 31, 2023 as well as prior periods for certain assumptions, examines other relevant inputs, and provides the proposed actuarial assumptions, both economic and demographic, to be used in the December 31, 2024 valuation.

The actuarial calculations were completed under the supervision of Andy Yeung, ASA, MAAA, FCA, 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.

Segal makes no representation or warranty as to the future status of the Plan and does not guarantee any particular result. This document does not constitute legal, tax, accounting or investment advice or create or imply a fiduciary relationship. The Board is encouraged to discuss any issues raised in this report with the Plan's legal, tax and other advisors before taking, or refraining from taking, any action.

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

Sincerely,

lavega

Todd Tauzer, FSA, MAAA, FCA, CERA Senior Vice President and Actuary

Eva y

Eva Yum, FSA, MAAA, EA Vice President and Actuary

Andy Yeing

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

EK/jl

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To project the cost and liabilities of the pension plan, assumptions are made about all future events that could affect the amount and timing of the benefits to be paid and the assets to be accumulated. Each year actual experience is compared against the projected experience, and to the extent there are differences, the future contribution requirement is adjusted.

If assumptions are modified, contribution requirements are adjusted to take into account a change in the projected experience in all future years. There is a great difference in both philosophy and cost impact between recognizing the actuarial deviations as they occur annually and changing the actuarial assumptions. Taking into account one year's gains or losses without making a change in the assumptions means that year's experience is treated as temporary and that, over the long run, experience will return to what was originally assumed. Changing assumptions reflects a basic change in thinking about the future, and has a much greater effect on the current contribution requirements than recognizing gains or losses as they occur.

The use of realistic actuarial assumptions is important in maintaining adequate funding, while paying the promised benefit amounts to participants already retired and to those near retirement. The actuarial assumptions used do not determine the "actual cost" of the plan. The actual cost is determined solely by the benefits and administrative expenses paid out, offset by investment income received. However, it is desirable to estimate as closely as possible what the actual cost will be so as to permit an orderly method for setting aside contributions today to provide benefits in the future, and to maintain equity among generations of participants and taxpayers.

This study was undertaken in order to review the economic and demographic actuarial assumptions and to compare the actual experience with that expected under the current assumptions during the three-year experience period from January 1, 2021 through December 31, 2023. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27 "Selection of Assumptions for Measuring Pension Obligations". This Standard of Practice provide guidance for the selection of the various actuarial assumptions utilized in a pension plan actuarial valuation. Based on the study's results and expected future experience, we are recommending various changes in the current actuarial assumptions.

We are recommending changes in the assumptions for merit and promotion salary increases, pre-retirement mortality, post-retirement (healthy and disabled) mortality, beneficiary mortality, disability incidence, termination, retirement from active employment, retirement age for deferred vested members, leave cashouts, sick leave conversion, percent of future deferred vested members expected to be covered by a reciprocal system, reciprocal salary increases, percent of members with an eligible survivor, and active death optional form election assumption for members who are assumed to be not married at pre-retirement death.



Our recommendations for the major actuarial assumption categories are as follows:

Pg #	Actuarial Assumption Category	Recommendation
12	Inflation: Future increases in the Consumer Price Index (CPI), which affects investment returns, active member salary increases and retiree COLAs.	Maintain the inflation assumption at 2.50% per annum as discussed in <i>Section 3(A)</i> .
15	Retiree COLA: Future increases in the cost-of-living adjustments (COLA) for retirees.	 Tiers with a 3% or 4% maximum COLA: Maintain the COLA assumption at 2.75% per annum (include inflation assumption of 2.50% plus a margin for adverse deviation of 0.25%) as discussed in <i>Section 3(A)</i> Tiers with a 2% maximum COLA: Maintain the COLA assumption at 2.00% per annum as discussed in <i>Section 3(A)</i>
16	Investment return: The estimated average net rate of return on current and future assets of the Association as of the valuation date. This rate is used to discount liabilities.	Maintain the investment return assumption at 6.75% per annum as discussed in <i>Section 3(B)</i> .
25	 Salary increases: Increases in the salary of a member between the date of the valuation to the date of separation from active service. This assumption has three components: Inflationary increase Real "across-the-board" increase Merit and promotion increase Payroll growth: Used to amortize the UAAL in determining the UAAL contribution rate. 	Maintain the inflationary salary increase assumption at 2.50% and maintain the real "across-the-board" salary increase assumption at 0.50%. Adjust the merit and promotion rates of salary increase as developed in <i>Section 3(C)</i> to reflect past experience. This includes introducing separate rates of merit and promotion salary increases for legacy and PEPRA members. The recommended total rates of salary increase anticipate higher increases overall than the current assumptions for General and Safety members. Maintain the payroll growth assumption (combined inflationary and real "across-the-board" salary increases) at 3.00%.
35	Administrative Expenses: Expenses incurred in connection with the plan's operation.	Maintain the administrative expense load assumption to be equal to the actual administrative expenses for the prior year as a percent of actual payroll for the prior year as discussed in <i>Section 3(D)</i> .



Pg #	Actuarial Assumption Category	Recommendation
36 Mortality rates — healthy: The probability of dying at each age for	Healthy retirees	
	Current base table for General members:	
	non-disabled members. Mortality rates are used to anticipate	Pub-2010 General Healthy Retiree Amount- Weighted Above-Median Mortality Table
	life expectancies.	Recommended base table for General members:
		Pub-2016 General Healthy Retiree Amount- Weighted Above-Median Mortality Table with rates increased by 5% for females
		Current base table for Safety members:
		Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and decreased by 5% for females
		Recommended base table for Safety members:
		Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and decreased by 5% for females
		Beneficiaries
		Current base table for beneficiaries in pay status at the valuation:
	Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and females	
		Recommended base table for beneficiaries in pay status at the valuation:
		Pub-2016 Contingent Survivor Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and females
	Current base table for beneficiaries not in pay status at the valuation:	
		Pub-2010 General Healthy Retiree Amount- Weighted Above-Median Mortality Table
		Recommended base table for beneficiaries not in pay status at the valuation:
		Pub-2016 General Healthy Retiree Amount- Weighted Above-Median Mortality Table with rates increased by 5% for females
		Pre-retirement mortality
		Current base table for General members:
		Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table
		Recommended base table for General members:
		Pub-2016 General Employee Amount-Weighted Above-Median Mortality Table with rates decreased by 5% for males and females



Pg #	Actuarial Assumption Category	Recommendation
		Current base table for Safety members:
		Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table
		Recommended base table for Safety members:
		Pub-2016 Safety Employee Amount-Weighted Above-Median Mortality Table
		Mortality projection
		Current and recommended projection:
		All tables are projected generationally with the two- dimensional mortality improvement scale MP-2021.
		Mortality for member contribution rates, optional forms and reserves: Adjust the mortality rates to those developed in <i>Section</i> $4(A)$ for legacy member contribution rates. A discussion of mortality rates for optional forms and reserves is also provided in <i>Section</i> $4(A)$.
45	Mortality rates — disabled: The	Disabled retirees
	probability of dying at each age for	Current base table for General members:
	Mortality rates are used to anticipate life expectancies.	Pub-2010 Non-Safety Disabled Retiree Amount- Weighted Mortality Table with rates increased by 5% for males
		Recommended base table for General members:
		Pub-2016 Non-Safety Disabled Retiree Amount- Weighted Mortality Table with rates increased by 5% for males and females
		Current base table for Safety members:
		Pub-2010 Safety Disabled Retiree Amount- Weighted Mortality Table with rates increased by 5% for males
		Recommended base table for Safety members:
		Pub-2016 Safety Disabled Retiree Amount- Weighted Mortality Table with rates increased by 5% for males and decreased by 5% for females
		Mortality projection
		Current and recommended projection:
		All tables are projected generationally with the two- dimensional mortality improvement scale MP-2021.
49	Disability incidence rates: The probability of becoming disabled at each age.	Adjust the disability rates to those developed in <i>Section 4(C)</i> to reflect slightly lower incidence of disability overall for General and Safety members.
56	Termination rates: The probability of leaving employment at each service interval.	Adjust the termination rates to those developed in <i>Section 4(D)</i> to reflect higher incidence of termination for General members and lower incidence of termination for Safety members.

Pg # Actuarial Assumption Category	Recommendation
61 Retirement rates: The probability of retirement at each age a member is	For active members, adjust the current retirement rates to those developed in <i>Section 4(E)</i> .
eligible to retire. Includes retirement age for deferred vested members.	For deferred vested members that work for a reciprocal employer, increase the assumed retirement age from 60 to 61 for General members and maintain the assumption at 53 for Safety members.
	For deferred vested members that do not work for a reciprocal employer, maintain the assumed retirement age of 60 for General members and reduce the assumption from 51 to 50 for Safety members.
78 Leave cashouts: Additional pay elements that are expected to be received during the member's final average earnings period.	Adjust the leave cashouts to those developed in Section $4(F)$.
81 Service from unused sick leave: Additional service that is expected to be received when the member retires due to conversion of unused sick leave.	Adjust the current service from unused sick leave conversion assumptions to those developed in Section $4(G)$.
 82 Miscellaneous assumptions: Reciprocity Percent with eligible survivor Eligible survivor age and gender Future benefit accruals Unknown data for members Form of payment Active death optional form elections 	Reduce the current proportion of future inactive members expected to be covered by a reciprocal system from 40% to 20% for General members and reduce the assumption from 70% to 50% for Safety members. In addition, increase the reciprocal salary increase assumption from 3.50% to 3.55% for General members and increase the assumption from 4.00% to 4.10% for Safety members. Increase the current proportion of active and deferred vested members expected to have an eligible survivor at retirement or pre-retirement death from 65% to 70% for males and increase the assumption from 50% to 55% for females. Maintain the eligible survivor age difference assumption that male retirees are three years older than their spouses and that female retirees are two years younger than their spouses. Maintain the assumption that male retirees are assumed to have a female spouse and that female retirees are assumed to have a male spouse. Maintain the current future benefit accrual assumption, adjust the assumption for members with unknown gender, and maintain the form of payment assumptions as outlined in <i>Section</i> 4(<i>H</i>). Introduce a new active death optional form election assumption for members who are assumed to be not married at pre-retirement death.

We have estimated the impact of the recommended assumption changes as if they were applied to the December 31, 2023 actuarial valuation. The table below provides an overview of the impact on key results, while more details, including the contribution impact by cost group, can be found in *Section 5*.



Cost Impact of All Recommended Assumptions Based on December 31, 2023 Actuarial Valuation

Valuation Result	Total Estimated Impact
Actuarial accrued liability	Decrease of \$41.3 million
Funded ratio	Increase of 0.30%
Average employer contribution rate	Decrease of 0.54% of payroll
Average member contribution rate	Increase of 0.03% of payroll

There is a decrease in the average employer rate of 0.54% (which includes a decrease in normal cost rate of about 0.30% and a decrease in the UAAL rate of about 0.24%). This decrease is mainly due to demographic assumption changes that reduce cost (such as higher termination rate, lower disability rate and new mortality tables that predict lower life expectancies for payees at advance ages) that is offset somewhat by the increase in the merit and promotion salary increases assumption.

There is an increase in the average member rate mainly due to the increase in the merit and promotion salary increases assumption. We note that the basic contribution rates for legacy members are not impacted by most of the demographic assumptions such as retirement rate, termination rate and disability rate. Therefore, the changes in those assumptions do not have an impact on the basic contribution rates for legacy members. Moreover, the reduction in the employer UAAL rate is also not shared by the members.

Section 2 provides some background on the basic principles and methodology used in the experience study for the review of the economic and demographic actuarial assumptions. A detailed discussion of each assumption and reasons for the proposed changes are found in *Section 3* for the economic assumptions and *Section 4* for the demographic assumptions. The cost impact of the proposed changes is detailed in *Section 5*. Lastly, a summary of all the current actuarial assumptions is provided in *Appendix A*, and a summary of all the proposed actuarial assumptions is provided in *Appendix B*.



Section 2: Background and Methodology

In this report, we analyzed both economic and demographic ("non-economic") assumptions.

The primary economic assumptions reviewed are inflation, investment return, salary increases, and administrative expenses. Demographic assumptions include the probabilities of certain events occurring in the population of members, referred to as "decrements" (e.g., termination from service, disability retirement, service retirement, and death before and after retirement). In addition to decrements, other demographic assumptions reviewed in this study include the percent of members assumed to go on to work for a reciprocal system, reciprocal salary increases, percentage of members with an eligible spouse or domestic partner, survivor age difference, leave cashouts, conversion of service from unused sick leave and active death optional form election assumption for members who are assumed to be not married at pre-retirement death.

Economic assumptions

Economic assumptions consist of:

- Inflation: Increases in the price of goods and services. The inflation assumption reflects the basic return that investors expect from securities markets. It also reflects the expected basic salary increase for active employees and drives increases in the allowances of retired members (if any).
- **Investment return:** Expected long-term rate of return on the Association's investments after accounting for certain investment expenses. This assumption has a significant impact on contribution rates.
- Salary increases: In addition to inflationary increases, it is assumed that salaries will also grow by real "across-the-board" pay increases in excess of price inflation. It is also assumed that employees will receive raises above these average increases as they advance in their careers, which are commonly referred to as merit and promotion increases. Payments to amortize any Unfunded Actuarial Accrued Liability (UAAL) are calculated to increase each year by the price inflation rate plus any real "across-the-board" pay increases that are assumed.
- Administrative Expenses: These include expenses incurred in connection with the Plan's operation.

The setting of these economic assumptions is described in Section 3.

Demographic assumptions

To determine the probability of an event occurring, we examine the "decrements" and "exposures" of that event. For example, when considering termination from service, we compare the number of employees who actually terminate in a specific service category (the number of



Section 2: Background and Methodology

"decrements") with those who could have terminated (the number of "exposures"). If there were 500 active employees in the 3–4 service category at the beginning of the year and 50 of them left during the year, the probability of termination in that service group is $50 \div 500$, or 10%.

The reliability of the resulting probability depends heavily on both the number of decrements and the number of exposures. For instance, if there are only a few people in a high service category at the beginning of the year (number of exposures), the probability of termination developed for that service category may be less credible, particularly if it does not align with the pattern shown for the other service categories. Similarly, when considering the death decrement, if an age category has a large number of exposures but very few decrements (actual deaths), then the probability developed for that category would still be considered less reliable.

One reason we use several years of experience for such a study is to enhance statistical reliability by increasing the number of exposures and decrements. Another reason for using several years of data is to smooth out any fluctuations that may occur from one year to the next. Nevertheless, we also calculate the rates on a yearly basis to check for any emerging trends in the more recent years.

The setting of the demographic assumptions is provided in Section 4.



A. Inflation

Unless an investment grows at least as fast as prices increase, investors will experience a reduction in the inflation-adjusted value of their investment. There may be times when "riskless" investments return more or less than inflation, but over the long term, investment market forces will generally require an issuer of fixed income securities to maintain a minimum return which protects investors from inflation.

The inflation assumption is long term in nature, so our analysis begins with a review of historical information. Following is a graph showing historical inflation rates and a comparison with the inflation assumption of 2.50% that we recommend in this report.



Historical Consumer Price Index (CPI) — 1930 to 2024¹ (U.S. City Average — All Urban Consumers)

There was a spike in inflation that started in the second quarter of 2021 and continued into 2022. The rate of inflation started to decrease after the Federal Reserve began to increase interest rates starting around the second quarter of 2022. The Federal Reserve then changed course and reduced interest rates three times since the third quarter of 2024 in reaction to a continued reduction in inflation. However, they have recently signaled a pause in their adjustment to the interest rates until more economic data becomes available. Based on the most recent inflation data, the change in the CPI from March 2024 to March 2025 was 2.4%.

¹ Source: Bureau of Labor Statistics – Based on CPI for All Items in U.S. city average, all urban consumers, not seasonally adjusted (Series ID: CUUR0000SA0).



Based on information found in the Public Plans Database, which is produced in partnership with the National Association of State Retirement Administrators (NASRA), the median inflation assumption used by 220¹ large public retirement funds in their 2023 fiscal year valuations was 2.50%. In California, CalSTRS and five² 1937 Act CERL systems currently use an inflation assumption of 2.75%, the other 15 1937 Act CERL systems use an inflation assumption of 2.50%³ (including CCCERA) and CalPERS uses an inflation assumption of 2.30%.

CCCERA's investment consultant, Verus, anticipates an annual inflation rate of 2.20% over a 30-year horizon, while the average inflation assumption provided by Verus and five other investment advisory firms retained by Segal's California public sector clients, as well as Segal's investment advisory division (Segal Marco Advisors), was 2.47%. Note that, in general, investment consultants use a time horizon for this assumption that is shorter than the time horizon we use for the actuarial valuation.⁴

To find a forecast of inflation based on a longer time horizon, we referred to the Social Security Administration's (SSA) 2024 report on the financial status of the Social Security program.⁵ The projected average increase in the CPI over the next 75 years under the intermediate cost assumptions used in that report was 2.40%, which the SSA has maintained for several years. The SSA report also includes alternative projections using lower and higher inflation assumptions of 1.80% and 3.00%, respectively.

We also compared the yields on the thirty-year inflation indexed U.S. Treasury bonds to comparable traditional U.S. Treasury bonds.⁶ This "break-even rate" is commonly regarded as a market-based gauge of future inflation expectations. As of March 2025, the difference in yields is 2.25% which provides a measure of market expectations of inflation. It is worth noting that even during the peak of the recent inflation spike this break-even rate exceeded 2.50% in only a single month, April 2022 (2.55%). This measure of market expectation for long-term inflation can be quite volatile, which is illustrated in the table on the following page.

¹ Among 228 large public retirement funds, the 2023 fiscal year inflation assumption was not available for 8 of the public retirement funds in the survey data as of April 2025.

- ² We note that none of these five 1937 Act CERL Systems are served by Segal.
- ³ Eight of these 1937 Act CERL systems use a 2.50% inflation assumption with a 2.75% COLA assumption.



⁴ The time horizon used by the investment consultants included in our review, with the exception of one investment consultant that uses a 1-year horizon, generally ranges from 20 years to 30 years, with Verus using a 30-year horizon.

⁵ Source: "Social Security Administration: The 2024 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds."

⁶ Source: Board of Governors of the Federal Reserve System.

Observation Month	Difference in Yields	Observation Month	Difference in Yields
February 2022	2.18%	September 2023	2.34%
March 2022	2.49%	October 2023	2.47%
April 2022	2.55%	November 2023	2.40%
May 2022	2.47%	December 2023	2.19%
June 2022	2.47%	January 2024	2.24%
July 2022	2.21%	February 2024	2.26%
August 2022	2.29%	March 2024	2.27%
September 2022	2.27%	April 2024	2.35%
October 2022	2.33%	May 2024	2.34%
November 2022	2.40%	June 2024	2.27%
December 2022	2.26%	July 2024	2.28%
January 2023	2.24%	August 2024	2.12%
February 2023	2.29%	September 2024	2.11%
March 2023	2.26%	October 2024	2.28%
April 2023	2.23%	November 2024	2.29%
May 2023	2.26%	December 2024	2.27%
June 2023	2.23%	January 2025	2.35%
July 2023	2.27%	February 2025	2.33%
August 2023	2.31%	March 2025	2.25%

The following graph shows CCCERA's historical and current proposed inflation assumptions compared to the two other metrics just discussed, going back to 2011. In effect, this compares CCCERA's assumption to two separate independent forecasts, one based on market observations and one developed by economists at the SSA. The graph shows that over the observed period, CCCERA's assumption has been generally higher, but consistently moving towards these other forecasts and seems to be in a stable place at this point in time.

Historical Inflation Forecasts



The setting of the inflation assumption using the information outlined above is a somewhat subjective process, and Segal does not apply a specific weight to each of the metrics in determining our recommended inflation assumption. Based on a consideration of all the above metrics, beginning in 2021 we have been recommending the same 2.50% inflation assumption in our experience studies for our California public retirement system clients.



Based on all of the above information, we recommend maintaining the annual inflation assumption at 2.50%.

Retiree Cost of Living Increases

In our last experience study as of December 31, 2021, the Board adopted the recommended cost-of-living adjustments (COLA) assumption of 2.75% for all retirees in tiers with a maximum COLA of 3% or 4%.¹ The adopted and the recommended COLA assumption was 2.00% for tiers with a maximum COLA of 2%. The assumption of 2.75% included a 0.25% margin above the recommended inflation assumption, to reflect the experience from the December-to-December CPI based on San Francisco-Oakland-Hayward area, which is used by the Board to set COLAs.

The table below shows the changes in the December-to-December CPI based on San Francisco-Oakland-Hayward area (used by the Board to set COLAs) for the most recent five-year, 10-year, 15-year and 20-year periods ending on December 31, 2024.

Period	Change in Dec-to-Dec CPI for San Francisco-Oakland- Hayward Area	Change in Dec-to-Dec CPI for U.S. City Average
5-year period	3.22%	4.20%
10-year period	3.27%	3.00%
15-year period	2.97%	2.56%
20-year period	2.82%	2.56%

With the exception of the most recent five-year period, the December-to-December CPI for the San Francisco-Oakland-Hayward area has historically been higher than the corresponding CPI change for the US City Average (which is a data point considered in setting the recommended inflation assumption). Therefore, we recommend maintaining the retiree COLA assumption of 2.75%, which includes a 0.25% margin above our recommended inflation assumption for retirees in tiers with a maximum COLA of 3% or 4%. Our recommended COLA assumption for tiers with a maximum 2% remains unchanged at 2.00%. A summary of the COLA Assumption by maximum COLA (which varies by tier), is shown below:

Ma	aximum COLA	Current Assumption	Proposed Assumption
:	2.00%	2.00%	2.00%
;	3.00%	2.75%	2.75%
	4.00%	2.75%	2.75%

¹ For current retirees and beneficiaries, we would utilize the accumulated COLA banks to value an annual 3.00% or 4.00% COLA increase to tiers with a maximum COLA of 3% or 4%, respectively, until those banks become depleted.



B. Investment return

The investment return assumption is comprised of two primary components, inflation and real rate of investment return, with adjustments for certain expenses and risk.

Real rate of investment return

This component represents the portfolio's incremental investment market returns over inflation. Generally, when an investor takes on greater investment risk, the return on the investment is expected to also be greater, at least in the long run.¹ This additional risk and return is expected to vary by asset class and empirical data supports that expectation. For that reason, the real rate of return assumptions are developed by asset class. Therefore, the real rate of return assumption for a retirement plan's portfolio will vary with the Board's asset allocation among asset classes.

The Association's current target asset allocation and the assumed real rate of return assumptions by asset class are shown in the following table. The first column of real rate of return assumptions are determined by reducing Verus' total or "nominal" 30-year return assumptions for 2025 by their assumed 2.20% inflation rate. The second column of returns (except for certain asset classes as noted in the table) represents the average of a sample of real rate of return assumptions. The sample includes the expected annual real rate of return provided to us by Verus and five other investment advisory firms retained by Segal's public sector clients, as well as Segal's investment advisory division (Segal Marco Advisors). We believe these averages are a reasonable consensus forecast of long-term future market returns in excess of inflation.²



¹ However, an argument can also be made that taking on more risk in the portfolio could justify a greater risk margin in the actuarial assumption used, to help manage that risk.

² Note that, just as for the inflation assumption, in general the time horizon used by the investment consultants in determining the real rate of return assumption is generally shorter than the time horizon encompassed by the actuarial valuation.

CCCERA'S Target Asset Allocation and Assumed Arithmetic Net Real Rate of Return Assumptions by Asset Class and for the Portfolio

	Percentage	Verus' Assumed Net Real Rate	Average Assumed Net Real Rate of Return from a Sample of Consultants to Segal's California
Asset Class	of Portfolio	of Return ¹	Public Sector Clients ²
U.S. Large-Cap Equity	9.00%	4.60%	5.59%
U.S. Small-Cap Equity	2.00%	6.40%	6.45%
International Developed Equity	5.00%	5.90%	6.23%
Global Equity	10.00%	5.20%	6.35%
Emerging Market Equity	2.00%	7.40%	7.89%
Short-term Gov't/Credit	14.00%	2.20%	1.84%
US Treasury	3.50%	2.10%	1.80%
Cash	3.00%	1.70%	0.98%
Private Equity	15.00%	8.70%	9.31%
Private Credit	13.00%	6.60%	6.47%
Real Estate — Debt	3.00%	5.00%	5.00% ³
Real Estate — Value-add	3.00%	7.90%	7.90% ³
Real Estate — Opportunistic	4.00%	9.70%	9.70% ³
Infrastructure	3.00%	7.20%	7.20% ³
Hedge Funds	6.50%	3.50%	3.50% ³
Multi-Sector Credit	4.00%	4.50%	4.50% ³
Total	100.00%	5.50%	5.72%

Generally, the above are representative of "indexed" returns for securities that are publicly traded, returns net of fees for securities that are non-publicly traded and do not include any additional returns ("alpha") from active management. Consideration of returns without alpha is consistent with the Actuarial Standard of Practice No. 27, Section 3.7.3.d, which states:

"Investment Manager Performance — Anticipating superior (or inferior) investment manager performance may be unduly optimistic (or pessimistic). The actuary should not assume that superior or inferior returns will be achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy unless the actuary believes, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period."



¹ The rates shown have been estimated by Segal by taking Verus' nominal arithmetic returns and reducing by Verus' assumed 2.20% inflation rate to develop the assumed real rate of return shown. These return assumptions are net of any applicable investment management expenses.

² These are based on the projected arithmetic returns provided by Verus and five other investment advisory firms serving Segal's public sector retirement clients in California, as well as Segal's investment advisory division. These return assumptions are net of any applicable investment management expenses.

³ For these asset classes, Verus' assumption is applied in lieu of the average because there is a larger disparity in returns for these asset classes among the firms surveyed and using Verus' assumption should more closely reflect the underlying investments made specifically for CCCERA.

The following are some observations about the returns provided above:

- 1. The investment consultants to our California public sector clients, as well as Segal's investment advisory division, have each provided us with their expected real rates of return for each asset class, over various future periods of time. However, in general, the returns available from investment consultants are projected over time periods that are shorter than the durations of a retirement plan's liabilities.
- 2. As discussed in the next section, the real rates of return provided this year by the investment consultants reflect a change in how investment expenses are reported.
- 3. Using a sample average of expected real rate of returns allows CCCERA's investment return assumption to reflect a broader range of capital market information and should help reduce year to year volatility in the investment return assumption.
- 4. We recommend that the 5.72% portfolio **net** real rate of return be used in the determination of CCCERA's investment return assumption, but with some caution. This return is 0.12% higher than the 5.60% **gross** return that was used three years ago in the review of the recommended investment return assumption for the December 31, 2021 valuation. This is before we consider the approximately 0.55% in investment management expense that, as discussed in the next section, will no longer be subtracted from this year's 5.72% net real rate of return.
- 5. The 0.12% increase in the portfolio real rate of return since 2021 is due to changes in the real rate of return assumptions provided to us by the investment advisory firms (+0.45% under the 2021 asset allocation), changes in CCCERA's target asset allocation (-0.50%) and the interaction effect between these changes (+0.17%). We believe the increase in the real rates of return provided to us by the investment advisory firms may be in part due to the low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate starting in 2022 (even though recently they have started to decrease). Additionally, it is worth noting that the real rates of return provided in these capital market assumptions are generally higher than the ten-year period following the Global Financial Crisis, and so altogether should be used with caution in selecting a long-term investment return assumption.

Investment expenses

For funding purposes, the real rate of return assumption for the portfolio needs to be adjusted for investment expenses expected to be paid from investment income. In prior experience studies, we adjusted the **gross** real rate of return developed using the target asset allocation by the investment expenses expected to be paid by CCCERA.

However, as prevailing practice by investment advisory firms is to provide us with the real rates of return **net** of expected investment expenses, especially for active portfolio management, we now need to make adjustments only for investment consulting fees, custodian fees and other miscellaneous investment expenses excluding investment manager fees.

The following table provides these investment expenses in relation to the actuarial value of assets for the six years ending December 31, 2023.



Investment Expenses as a Percentage of Actuarial Value of Assets (\$ in '000s)

Year Ending December 31	Actuarial Value of Assets ¹	Investment Expenses ^{2,3}	Investment Expenses as %
2018	\$8,195,517	\$2,628	0.03%
2019	8,666,778	3,783	0.04%
2020	9,144,580	3,946	0.04%
2021	9,678,508	3,964	0.04%
2022	10,451,125	4,058	0.04%
2023	10,878,818	4,672	0.04%

Investment Expenses Averages and Assumptions

Averaging Period and Assumption	Investment Expenses
Three-year average (2021 – 2023)	0.04%
Six-year average (2018 – 2023)	0.04%
Current assumption (including investment management fees)	0.60%
Proposed assumption (excluding investment management fees)	0.05%

Based on the above experience, we recommend reducing the investment expense component of the investment return assumption from 0.60% to 0.05%.

Note related to investment expenses paid to active managers – As cited above, under Section 3.7.3.d of ASOP No. 27, the effect of an active investment management strategy should be considered "net of investment expenses…unless the actuary believes, based on relevant data, that such superior or inferior returns represent a reasonable expectation over the measurement period."

We have not performed a detailed analysis to measure how much of the investment expenses paid to active managers might have been offset by additional returns ("alpha") earned by that active management. For this study, we will continue to use the current approach that any "alpha" that may be identified would be treated as an increase in the risk adjustment and corresponding confidence level that are discussed in the next section. However, as discussed above, the real return assumptions provided by the investment advisory firms assume that active management will generate additional returns to cover the expense of such management, an assumption that is consistent with ASOP No. 27.

¹ As of beginning of plan year.



² Equals the sum of investment consulting fees, custodian fees and other miscellaneous investment expenses. Excludes investment manager fees.

³ Net of securities lending expenses. Because we do not assume any additional net return for this program, we effectively assume that any securities lending expenses will be offset by related income.

Model change

The 5.72% expected real rate of return developed earlier in this report was based on expected arithmetic average returns. A retirement system using an expected arithmetic average return as the discount rate in a funding valuation is expected, over long periods of time, to have no surplus or asset shortfall relative to its expected obligations assuming all other actuarial assumptions are met in the future.¹ That is the basis used in Segal's previous experience studies for CCCERA.

Beginning with this study, in addition to no longer including an explicit adjustment for investment management fees, we are converting the portfolio's expected arithmetic average return to an expected geometric average return. A retirement system using an expected geometric average return as the discount rate in a funding valuation will, over long periods of time, have an equal likelihood of having a surplus or asset shortfall relative to its expected obligations assuming all actuarial assumptions are met in the future.² For any given asset portfolio, the expected geometric average return.³

Risk adjustment

The real rate of return assumption for the portfolio is adjusted to reflect the potential risk of shortfalls in the return assumptions. CCCERA's asset allocation determines this portfolio risk, since risk levels are driven by the variability of returns for the various asset classes and the correlation of returns among those asset classes. This portfolio risk is incorporated into the real rate of return assumption through a risk adjustment.

The purpose of the risk adjustment (as measured by the corresponding confidence level) is to increase the likelihood of achieving the actuarial investment return assumption in the long term.⁴ It also acknowledges that investment results carry significant volatility over time, and yet the proposed assumption is a static number that does not explicitly convey this risk. This practice of a risk adjustment is consistent with our experience that retirement plan fiduciaries would generally prefer that returns exceed the assumed rate more often than not.

Under either the arithmetic or geometric model, the confidence level associated with a particular risk adjustment represents a relative likelihood that future investment earnings would equal or exceed the assumed earnings over a 15-year period. The 15-year time horizon represents an approximation of the "duration" of the fund's liabilities, where the duration of a liability represents the sensitivity of that liability to interest rate variations.

For comparison purposes we first consider how the model used in previous experience studies for CCCERA would look if used in this year's study. Three years ago, the Board adopted an investment return assumption of 6.75%. Under the model used in that experience study, that return implied a risk adjustment of 0.75%, corresponding to a 15-year confidence level of 59%, based on an annual portfolio return standard deviation of 12.50% provided by Verus in 2022.



¹ The mathematical terminology for this is that the mean (or average) surplus or asset shortfall is expected to be zero.

² The mathematical terminology for this is that over time the median surplus or asset shortfall is expected to be zero.

³ This is because the expected geometric average return reflects expected median outcomes, while the expected arithmetic average return reflects expected average or mean outcomes. Expected median outcomes are lower than expected average outcomes because they are less affected by the possibility of extraordinary ("outlier") favorable outcomes.

⁴ This type of risk adjustment is referred to in the Actuarial Standards of Practice as a "margin for adverse deviation."
If we use the same 59% 15-year confidence level from our last study to set this year's risk adjustment, along with the same methodology, and the current annual portfolio return standard deviation of 10.90% provided by Verus, the corresponding risk adjustment would be 0.66% (the slightly lower standard deviation allows for a slightly lower risk adjustment). Together with the other investment return components (including for this comparison updated expected arithmetic average returns and **the same expense adjustment as used in the prior study**), this would result in an investment return assumption of 6.96%, which is higher than the current assumption of 6.75%. This result would leave room for a potentially larger risk adjustment and confidence level in this year's study based on the previous methodology.

Based on the general practice of using one-quarter percentage point increments for economic assumptions, we evaluated the effect on the confidence level of other alternative investment return assumptions. We also considered that, as discussed above, the increase in the real rates of return provided by the investment consultants may reflect the low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate starting in 2022 (even though recently they have started to decrease), and so could be overly optimistic for use in selecting a long-term investment return assumption. For that reason, for this comparison value we evaluated a net investment return assumption of 6.75% which, together with the other investment return components, would produce a risk adjustment of 0.87% which corresponds to a confidence level of 62% **under the model and expense adjustment used in prior studies**. We believe this increase in confidence level is appropriate given the concerns stated.

As noted above, beginning with this study, in addition to no longer including an explicit adjustment for investment management fees, we are converting the portfolio's expected arithmetic average return to an expected geometric average return. For any given asset portfolio, the expected geometric average return will be less than the expected arithmetic average return. The difference depends on the variability of the portfolio as measured by its standard deviation. The annual portfolio standard deviation provided by Verus is 10.90%, which produces a conversion factor to the expected return of 0.56%. This results in an expected geometric average real return of 5.72% reduced by 0.56%).

Together with the other investment return components (now excluding investment management expenses) and **prior to any risk adjustment**, this would result in a median expected (or geometric average return) assumption of 7.61%, which is higher than the current assumption of 6.75%. In applying this model to CCCERA for the first time, we again evaluated a net investment return assumption of 6.75% which, together with the other investment return components, would produce a risk adjustment of 0.86% and a corresponding confidence level of 62%.

Recommended investment return assumption

The following table summarizes the components of the recommended investment return assumption developed in the previous discussion. For comparison purposes, we have also included similar values from the last study as well as the comparison values discussed above that apply the prior study's model to this year's information.



Assumption Component	December 31, 2024 Geometric Model Recommended ¹ Value	December 31, 2024 Arithmetic Model For Comparison ² Only	December 31, 2021 Adopted ² Value
Inflation	2.50%	2.50%	2.50%
Portfolio expected arithmetic real rate of return	5.72%	5.72%	5.60%
Adjustment to expected geometric real rate of return	(0.56)%	N/A	N/A
Expense adjustment	(0.05)%	(0.60)% ³	(0.60)%
Risk adjustment	(0.86)%	(0.87)%	(0.75)%
Total	6.75%	6.75%	6.75%
Confidence level	62%	62%	59%

Based on this analysis, we recommend maintaining the investment return assumption at 6.75% per annum.

The table below shows CCCERA's recommended investment return assumption and the corresponding risk adjustment and confidence level compared to the similar values for prior studies.

Historical Investment Return Assumptions, Risk Adjustments and Confidence Levels based on Assumptions Adopted by the Board

Years Ending December 31	Investment Return⁴	Risk Adjustment	Corresponding Confidence Level
2006 - 2008	7.80%	0.86%	60%
2009 - 2011	7.75%	0.41%	55%
2012 - 2014	7.25%	0.25%	53%
2015 - 2017	7.00%	0.30%	54%
2018 - 2020	7.00%	0.61%	59%
2021 – 2023	6.75%	0.75%	59%
2024 (Recommended)	6.75%	0.86%	62%

As we have discussed in prior experience studies, the risk adjustment model and associated confidence level is most useful as a means for comparing how CCCERA has positioned itself relative to risk over periods of time.⁵ The use of a 62% confidence level should be considered in context with other factors, including:

- ¹ Based on expected geometric average returns.
- ² Based on expected arithmetic average returns.
- ³ For purposes of these comparison values, we have assumed the same investment expenses as in the previous study, which included investment management fees.
- ⁴ The investment return assumptions since 2015 are gross of administrative expenses.

⁵ In particular, it would not be appropriate to use this type of risk adjustment as a measure of determining an investment return rate that is "risk-free."



- As noted above, the confidence level is more of a relative measure than an absolute measure, and so can be reevaluated and reset for future comparisons. This is particularly true when comparing confidence levels developed using different models, as we are doing in this transitional year from one model to another.
- The confidence level is based on the standard deviation of the portfolio that is determined and provided to us by Verus. The standard deviation is a statistical measure of the future volatility of the portfolio and so is itself based on assumptions about future portfolio volatility and can be considered somewhat of a "soft" number.
- We have not taken into account any additional returns ("alpha") that might be earned on active management. This means that if active management generates enough alpha to cover its related expenses, this would increase returns. This aspect of Segal's model is further evaluated below.
- As with any model, the results of the risk adjustment model should be evaluated for reasonableness and consistency. This is discussed in the later section on "Comparing with other public retirement systems".

Comparison with alternative model used to review investment return assumption

In previous studies, we have consistently reviewed investment return assumptions based on our old model that incorporates expected arithmetic real returns for the different asset classes and for the entire portfolio as one component of that model.¹ The use of "forward looking expected arithmetic returns" is one of the approaches discussed for use in the Selection of Assumptions for measuring Pension Obligations under Actuarial Standards of Practice (ASOP) No. 27.

Besides using forward looking expected arithmetic returns, ASOP No. 27 also discusses setting investment return assumptions using an alternative "forward looking expected geometric returns" approach, which is the model we have used in this study.² Even though as noted earlier expected geometric returns are lower than expected arithmetic returns, public retirement systems that have set investment return assumptions using this geometric approach have in practice adopted investment return assumptions that are comparable to those adopted by the Board for CCCERA under the arithmetic approach in the past. This is because under the model used by those retirement systems and by Segal in this report, the investment return assumption is **not** reduced to anticipate future investment management expenses. For CCCERA, these two changes almost offset each other entirely, which is why, as shown earlier, the same 6.75% assumption has essentially the same confidence level under the two models (comparison values and recommended value).

In the interest of still having an alternative model for comparison, we evaluated the recommended 6.75% assumption based on the expected geometric return for the entire portfolio gross of investment management expenses, but using a fully stochastic approach and a different source for capital market assumptions. Under this alternative model, over a 15-year



¹ Again, as discussed earlier in this section, if a retirement system uses the expected arithmetic average return as the discount rate in the funding valuation, that retirement system is expected to have no surplus or asset shortfall relative to its expected obligations assuming all actuarial assumptions are met in the future.

² As also noted earlier in slightly different terms, if a retirement system uses the expected geometric average return as the discount rate in the funding valuation, that retirement system is expected to have an asset value that generally converges to the median accumulated value as the time horizon lengthens assuming all actuarial assumptions are met in the future.

period, there is a 62% likelihood that future average geometric returns will meet or exceed 6.75%¹ developed using the capital market assumptions compiled by Horizon Actuarial Services based on their most recent survey published in August 2024. This 62% likelihood of achieving a 6.75% return is higher than the corresponding likelihood of 58% (for achieving a 6.75% return) that we observed in this comparison during the assumption review in 2021.

Comparing with other public retirement systems

One final test of the recommended investment return assumption is to compare it against those used by other public retirement systems, both in California and nationwide.

We note that an investment return of 6.75% or lower is becoming more common among California public sector retirement systems. Of the twenty 1937 Act CERL systems, one uses a 7.25% investment assumption, six use 7.00%, nine use 6.75% (including CCCERA), three use 6.50%, and one uses 6.25%. Furthermore, CalSTRS currently uses a 7.00% investment return assumption and CalPERS uses a 6.80% investment return assumption.

The following table compares CCCERA's recommended investment return assumption against those of the 221² large public retirement funds in their 2023 fiscal year valuations based on information found in the Public Plans Database, which is produced in partnership with NASRA:

CCCERA's Investment Return vs. Public Plans Database³ Investment Return Assumptions

Assumption	CCCERA	Public Plan Data Low	Public Plan Data Median	Public Plan Data High
Net investment return	6.75%	4.31%	7.00%	8.25%

The detailed survey results show that over 80% of the systems have an investment return assumption in the range of 6.75% to 7.50%. Also, over three quarters of the systems have reduced their investment return assumption from 2017 to 2023. State systems outside of California tend to change their economic assumptions less frequently and so may lag behind emerging practices in this area.



¹ We performed this stochastic simulation using the capital market assumptions included in the 2024 survey prepared by Horizon Actuarial Services. That simulation was performed using 10,000 trial outcomes of future market returns, using assumptions from 20-year arithmetic returns, standard deviations and correlation matrix that were found in the 2024 survey that included responses from 26 investment advisors.

² Among 228 large public retirement funds, the 2023 fiscal year investment return assumption was not available for 7 of the public retirement funds in the Public Plans Database as of April 2025.

³ Public Plans Data website – Produced in partnership with the National Association of State Retirement Administrators (NASRA).

C. Salary increases

Salary increases impact plan costs in two ways:

- 1. Increasing members' benefits (since benefits are a function of the members' highest average pay) and future normal cost collections; and
- 2. Increasing total active member payroll which in turn generates lower UAAL contribution rates as a percent of payroll.

As an employee progresses through his or her career, increases in pay are expected to come from three sources:

1. **Inflation:** Unless pay grows at least as fast as consumer prices grow, employees will experience a reduction in their standard of living. There may be times when pay increases lag or exceed inflation, but over the long term, labor market forces may require an employer to maintain its employees' standards of living.

As discussed earlier in this report, we recommend maintaining the annual inflation assumption at 2.50%. This inflation component is used as part of the salary increase assumption.

2. Real "across-the-board" pay increases: These increases are typically termed productivity increases since they are considered to be derived from the ability of an organization or an economy to produce goods and services in a more efficient manner. As that occurs, at least some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all employees "across the board." The State and Local Government Workers Employment Cost Index produced by the Department of Labor provides evidence that real "across-the-board" pay increases have averaged about 0.2% – 0.4% annually during the last ten to twenty years.

We also referred to the annual report on the financial status of the Social Security program published in May 2024. In that report, real "across-the-board" pay increases are forecast to be 1.14% per year under the intermediate assumptions.

The real pay increase assumption is generally considered a more "macroeconomic" assumption that is not necessarily based on individual plan experience. However, the following table compares CCCERA's recent salary experience to the change in CPI over the three-year period ending December 31, 2023 in the following table:

Valuation Date	Actual Average Wage Inflation ¹	Actual December to December Change in CPI ²
December 31, 2021	3.79%	4.24%
December 31, 2022	4.91%	4.88%
December 31, 2023	4.86%	2.62%
Three-year average	4.52%	3.91%

Based on the above information, we recommend maintaining the real "across-theboard" salary increase assumption at 0.50%.

¹ Reflects the increase in average salary for members at the beginning of the year versus those at the end of the year. It does not reflect the average salary increases received by members who worked the full year.

² Based on the change in the December CPI index for the San Francisco-Oakland-Hayward Area compared to the prior year.



3. **Merit and promotion increases:** As the name implies, these increases come from an employee's career advancement. This form of pay increase differs from the previous two, since it is specific to the individual. For CCCERA, we continue to recommend service-specific merit and promotion increase assumptions.

The annual merit and promotion increases are determined by measuring the actual increases received by members over the experience period, net of the inflationary and real "across-the-board" pay increases. This is accomplished by:

- a. Measuring each continuing member's actual salary increase over each year of the experience period on a salary-weighted basis, with higher weights assigned to experience from members with larger salaries;
- b. Excluding any members with increases of more than 50% or decreases of more than 10% during any particular year;
- c. Categorizing these increases into groups by years of service;
- d. Removing the wage inflation component from these increases (assumed to be equal to the increase in the members' average salary during the year, calculated separately for General and Safety members);
- e. Averaging these annual increases over the experience period; and
- f. Modifying current assumptions to reflect some portion of these measured increases reflective of their "credibility."

To be consistent with the other economic assumptions, these merit and promotion assumptions should be used in combination with the total 3.00% assumed inflation and real "across-the-board" increases recommended in this study.

Merit and promotion increases are measured separately for General and Safety members. Note that beginning with this experience study, we are also recommending separate merit and promotion increase assumptions for Legacy and PEPRA members.

Due to the high variability of the actual salary increases, we have analyzed this assumption using data for the past **six** years. We believe that when the experience from the current and prior study is combined, it provides a more reasonable representation of potential future merit and promotion salary increases over the long term.

The following table shows the General Legacy members' actual average merit and promotion increases by years of service over the three-year period from January 1, 2021 through December 31, 2023. As mentioned above, we have also included the actual average increases based on the past six years (January 1, 2018 through December 31, 2023) for General Legacy and PEPRA members. These actual increases were reduced by the actual average inflation plus "across-the-board" increase (i.e., wage inflation, estimated as the increase in average salaries) for each year during the experience period (4.39% on average for the most recent three-year period and 4.43% for the most recent six-year period). The current and proposed assumptions are also shown.





Years of Service	Current Assumption	Actual Average (Last 3 Years: Legacy)	Actual Average (Last 6 Years: Legacy & PEPRA)	Proposed Assumption
Less than 1	11.00%	0.35%	3.19%	11.00%
1 – 2	6.50%	1.64%	4.59%	6.50%
2 – 3	4.75%	5.74%	3.52%	4.75%
3 – 4	3.50%	2.27%	2.38%	3.50%
4 – 5	2.50%	4.23%	2.18%	2.50%
5 – 6	2.00%	2.05%	1.58%	2.00%
6 – 7	1.75%	2.44%	1.63%	1.75%
7 – 8	1.65%	2.21%	1.65%	1.65%
8 – 9	1.45%	1.93%	1.70%	1.65%
9 – 10	1.35%	2.69%	2.38%	1.70%
10 – 11	1.30%	2.18%	1.81%	1.70%
11 – 12	1.10%	1.48%	0.87%	1.25%
12 – 13	1.00%	0.95%	0.54%	1.10%
13 – 14	0.90%	1.46%	0.89%	1.20%
14 – 15	0.80%	1.86%	1.68%	1.30%
15 – 16	0.75%	1.73%	1.32%	1.30%
16 – 17	0.70%	1.34%	0.81%	1.00%
17 – 18	0.65%	1.15%	0.71%	0.90%
18 – 19	0.60%	0.80%	0.52%	0.80%
19 – 20	0.55%	1.15%	0.58%	0.75%
20 – 21	0.50%	1.08%	0.81%	0.75%
21 – 22	0.50%	0.41%	0.26%	0.60%
22 – 23	0.50%	0.91%	0.70%	0.60%
23 – 24	0.50%	1.14%	0.85%	0.60%
24 – 25	0.50%	0.56%	0.51%	0.60%
25 and over	0.50%	0.63%	0.43%	0.55%

General Legacy – Merit and Promotion Salary Increase Rates

For General Legacy members with less than eight years of service, we recommend no changes to the current merit and promotion salary increases. This is because at those years of service, there is relatively limited experience available for General Legacy members since most of the members have entered the PEPRA Tiers.

For General Legacy members with more than eight years of service, based on the General Legacy and PEPRA combined experience from the last six years, we recommend increasing the merit and promotion salary increases for all service categories.

Chart 1 on page 33 compares the actual merit and promotion increase experience for General Legacy members with the current and proposed assumptions.

The following table shows similar information for General PEPRA members, with the exception that the actual average merit and promotion increases by years of service over



the three-year period from January 1, 2021 through December 31, 2023 are shown for PEPRA members only.

Years of Service	Current Assumption	Actual Average (Last 3 Years: PEPRA) ¹	Actual Average (Last 6 Years: Legacy & PEPRA)	Proposed Assumption
Less than 1	11.00%	2.10%	3.19%	9.00%
1 – 2	6.50%	5.48%	4.59%	6.00%
2 – 3	4.75%	4.35%	3.52%	4.50%
3 – 4	3.50%	2.96%	2.38%	3.25%
4 – 5	2.50%	2.68%	2.18%	2.50%
5 – 6	2.00%	1.96%	1.58%	2.00%
6 – 7	1.75%	1.66%	1.63%	1.70%
7 – 8	1.65%	1.54%	1.65%	1.60%
8 – 9	1.45%	1.60%	1.70%	1.65%
9 – 10	1.35%	2.98%	2.38%	1.70%
10 – 11	1.30%	1.45%	1.81%	1.70%
11 – 12	1.10%	0.86%	0.87%	1.25%
12 – 13	1.00%	N/A	0.54%	1.10%
13 – 14	0.90%	N/A	0.89%	1.20%
14 – 15	0.80%	N/A	1.68%	1.30%
15 – 16	0.75%	N/A	1.32%	1.30%
16 – 17	0.70%	N/A	0.81%	1.00%
17 – 18	0.65%	N/A	0.71%	0.90%
18 – 19	0.60%	N/A	0.52%	0.80%
19 – 20	0.55%	N/A	0.58%	0.75%
20 – 21	0.50%	N/A	0.81%	0.75%
21 – 22	0.50%	N/A	0.26%	0.60%
22 – 23	0.50%	N/A	0.70%	0.60%
23 – 24	0.50%	N/A	0.85%	0.60%
24 – 25	0.50%	N/A	0.51%	0.60%
25 and over	0.50%	N/A	0.43%	0.55%

General PEPRA – Merit and Promotion Salary Increase Rates

For General PEPRA members with less than eight years of service, based on the General PEPRA experience only from the last three years, we recommend decreasing the merit and promotion salary increases for most service categories. As mentioned earlier, the recommended assumptions for members with more than eight years of service are based on the combined experience for General Legacy and PEPRA members from the last six years.

Chart 2 on page 33 compares the actual merit and promotion increase experience for General PEPRA members with the current and proposed assumptions.

¹ A value of "N/A" represents a service bucket for which there were less than five exposures over the time-period measured.



The following table shows the Safety Legacy members' actual average merit and promotion increases by years of service over the three-year period from January 1, 2021 through December 31, 2023. As mentioned above, we have also included the actual average increases based on the past six years (January 1, 2018 through December 31, 2023) for Safety Legacy and PEPRA members. These actual increases were reduced by the actual average inflation plus "across-the-board" increase (i.e., wage inflation, estimated as the increase in average salaries) for each year during the experience period (4.82% on average for the most recent three-year period and 4.89% for the most recent six-year period). The current and proposed assumptions are also shown.

Years of Service	Current Assumption	Actual Average (Last 3 Years: Legacy) ¹	Actual Average (Last 6 Years: Legacy & PEPRA)	Proposed Assumption
Less than 1	12.00%	N/A	2.19%	12.00%
1 – 2	8.50%	N/A	9.13%	8.50%
2 – 3	5.50%	N/A	5.48%	5.50%
3 – 4	5.00%	N/A	5.05%	5.00%
4 – 5	4.00%	N/A	4.44%	4.00%
5 - 6	3.00%	3.84%	3.59%	3.00%
6 – 7	2.25%	4.08%	2.10%	2.25%
7 – 8	1.75%	2.14%	1.39%	1.75%
8 – 9	1.50%	2.65%	2.16%	1.75%
9 – 10	1.45%	2.61%	1.93%	1.75%
10 – 11	1.40%	1.82%	1.85%	1.60%
11 – 12	1.35%	1.19%	1.34%	1.60%
12 – 13	1.30%	1.54%	1.67%	1.60%
13 – 14	1.25%	1.99%	2.18%	1.70%
14 – 15	1.25%	3.41%	2.74%	1.80%
15 – 16	1.25%	2.22%	1.99%	1.80%
16 – 17	1.25%	1.27%	1.30%	1.50%
17 – 18	1.25%	1.72%	1.48%	1.50%
18 – 19	1.25%	1.34%	1.57%	1.50%
19 – 20	1.25%	2.41%	1.98%	1.75%
20 – 21	1.00%	2.69%	2.25%	1.75%
21 – 22	1.00%	1.89%	1.41%	1.40%
22 – 23	1.00%	1.62%	1.58%	1.30%
23 – 24	1.00%	2.60%	2.32%	1.25%
24 – 25	1.00%	1.43%	1.75%	1.15%
25 and over	1.00%	1.55%	1.41%	1.10%

Safety Legacy — Merit and Promotion Salary Increase Rates

For Safety Legacy members with less than eight years of service, we recommend no changes to the current merit and promotion salary increases. This is because at those

¹ A value of "N/A" represents a service bucket for which there were less than five exposures over the time-period measured.



years of service, there is relatively limited experience available for Safety Legacy members since most of those members have entered the PEPRA tiers.

For Safety Legacy members with more than eight years of service, based on the Safety Legacy and PEPRA combined experience from the last six years, we recommend increasing the merit and promotion salary increases for all service categories.

Chart 3 on page 34 compares the actual merit and promotion increase experience for Safety Legacy members with the current and proposed assumptions.

The following table shows similar information for Safety PEPRA members, with the exception that the actual average merit and promotion increases by years of service over the three-year period from January 1, 2021 through December 31, 2023 are shown for PEPRA only.



Years of Service	Current Assumption	Actual Average (Last 3 Years: PEPRA) ¹	Actual Average (Last 6 Years: Legacy & PEPRA)	Proposed Assumption
Less than 1	12.00%	0.86%	2.19%	10.00%
1 – 2	8.50%	9.07%	9.13%	8.50%
2 – 3	5.50%	5.97%	5.48%	5.50%
3-4	5.00%	5.22%	5.05%	5.00%
4 – 5	4.00%	4.67%	4.44%	4.25%
5-6	3.00%	3.50%	3.59%	3.25%
6 – 7	2.25%	2.16%	2.10%	2.25%
7 – 8	1.75%	1.25%	1.39%	1.75%
8 – 9	1.50%	1.58%	2.16%	1.75%
9 – 10	1.45%	1.81%	1.93%	1.75%
10 – 11	1.40%	N/A	1.85%	1.60%
11 – 12	1.35%	N/A	1.34%	1.60%
12 – 13	1.30%	N/A	1.67%	1.60%
13 – 14	1.25%	N/A	2.18%	1.70%
14 – 15	1.25%	N/A	2.74%	1.80%
15 – 16	1.25%	N/A	1.99%	1.80%
16 – 17	1.25%	N/A	1.30%	1.50%
17 – 18	1.25%	N/A	1.48%	1.50%
18 – 19	1.25%	N/A	1.57%	1.50%
19 – 20	1.25%	N/A	1.98%	1.75%
20 – 21	1.00%	N/A	2.25%	1.75%
21 – 22	1.00%	N/A	1.41%	1.40%
22 – 23	1.00%	N/A	1.58%	1.30%
23 – 24	1.00%	N/A	2.32%	1.25%
24 – 25	1.00%	N/A	1.75%	1.15%
25 and over	1.00%	N/A	1.41%	1.10%

Safety PEPRA — Merit and Promotion Salary Increase Rates

For Safety PEPRA members with less than eight years of service, based on the Safety PEPRA experience only from the last three years, we recommend the above adjustments to the merit and promotion salary increases. As mentioned earlier, the recommended assumptions for members with more than eight years of service are based on the combined experience for Safety Legacy and PEPRA members from the last six years.

Based on this experience, we are proposing overall increases in the merit and promotion salary increases for General and Safety members. For General PEPRA and Safety PEPRA members, we are proposing an overall decreases in the service categories less than eight.

Chart 4 on page 34 compares the actual merit and promotion increase experience for Safety PEPRA members with the current and proposed assumptions.

¹ A value of "N/A" represents a service bucket for which there were less than five exposures over the time-period measured.



Active member payroll

Projected active member payrolls are used to develop the UAAL contribution rate. Future values are determined as a product of the number of employees in the workforce and the average pay for all employees. The average pay for all employees increases only by inflation and real "across-the-board" pay increases. The merit and promotion increases are not included, because this average pay is not specific to an individual.

Under the Board's current practice, the UAAL contribution rate is developed by assuming that the number of active members will remain about the same, so that the total payroll for all active members will increase annually over the amortization periods at the same assumed rates of inflation plus real "across-the-board" salary increase assumptions as are used to project the members' future benefits. Note again that this does not include the assumed merit and promotion increases, because longer service members are assumed to be replaced by new members.

As part of reviewing the current practice, we have summarized in the table below how the number of active members and total payroll has changed over the last six valuations.

Year Ending December 31	Number of Active Members	Total Payroll (\$ in '000s)
2018	10,021	\$850,522
2019	10,075	891,202
2020	10,099	941,299
2021	10,005	967,867
2022	10,082	1,023,166
2023	10,349	1,101,262
Average Annual Increase	0.65%	5.30%

Active Members and Total Payroll

The average annual rate of increase in payroll during the above period was 5.30% before accounting for the 0.65% growth in the total active workforce (and 4.63% after netting out the impact due to the growth in the active workforce). The average annual rate of increase in payroll is also affected by the number of PEPRA members who have reached the limit on pensionable compensation imposed by PEPRA. This is because everything else being equal, after those members reach the pensionable compensation limit, their salaries as applied in the computation of the total payroll would only increase by inflation (and no across-the-board salary increase). In the case of CCCERA, the proportion of members who have reached the limit was about 7% as of December 31, 2023.

After considering the above factors and experience, we recommend maintaining the payroll growth assumption at 3.00% annually (consistent with the combined recommended inflation and real "across-the-board" salary increase assumptions).







Chart 3: Merit and Promotion Salary Increase Rates Safety Legacy Members





D. Administrative expenses

Like benefit payments made to members, expenses incurred in connection with the plan's operation are paid from CCCERA's assets. These expenses include fees for administrative, legal, accounting, and actuarial services, as well as routine costs for printing, mailings, computer-related activities, and other functions carried out by the plan. They do not include investment-related expenses.

In order to reflect future administrative expenses in the contribution rates, a load is calculated based on actual administrative expenses as a percentage of payroll. It is allocated between the employer and member based on normal cost (before expenses) for the employer and the member. This assumption is subject to change each year based on actual administrative expenses and payroll.

The following table shows actual administrative expenses as a percent of covered payroll.

Year Ending December 31,	Actual Payroll for Year	Actual Administrative Expenses	Total %
2021	\$976,332,448	\$11,237,383	1.15%
2022	1,023,662,811	11,537,709	1.13%
2023	1,093,972,642	12,839,955	1.17%
Average	\$1,031,322,634	\$11,871,682	1.15%

Administrative Expenses as a Percentage of Covered Payroll

The experience shows that actual administrative expenses when expressed as a percent of payroll have been relatively stable during the three-year period shown above. In the prior three-year period, the average was 1.15%.

We recommend maintaining the practice of setting the administrative expense assumption to be equal to the actual administrative expenses for the prior year as a percent of payroll for the prior year.

There will still be actuarial gains and losses associated with this assumption; however, the assumption will be adjusted to the most recent experience in each valuation.



A. Mortality rates — healthy

The "healthy" mortality rates project the life expectancy of a member who retires from service (i.e., who did not retire on a disability pension). Also, the "healthy" pre-retirement (employee) mortality rates project what proportion of members will live to retirement.

In 2019, the Retirement Plans Experience Committee (RPEC) of the SOA published the first family of mortality tables based exclusively on public sector pension plan experience in the United States referred to as the Pub-2010 Public Retirement Plans Mortality Tables (Pub-2010). In January 2025, RPEC released an exposure draft of updated mortality experience for public retirement plans, referred to as the Pub-2016 Public Retirement Plans Mortality Tables (Pub-2016)¹. The Pub-2016 mortality tables are expected to be formally approved by the SOA later this year. For this experience study, we are recommending a switch from the Pub-2010 mortality tables to the recently updated Pub-2016 mortality tables for all mortality related assumptions.

Within the Pub-2010 and Pub-2016 family of mortality tables, there are separate tables by job categories of General, Safety and Teachers. Included with the mortality tables is the analysis prepared by RPEC that continues to observe that benefit amount for healthy retirees and salary for employees are the most significant predictors of mortality differences within the job categories. Therefore, Pub-2010 and Pub-2016 include mortality rates developed on an "amount-weighted" basis, with higher credibility assigned to experience from annuitants and employees receiving larger benefits and salaries, respectively.

A generational mortality table provides dynamic projections of mortality experience for each cohort of retirees. For example, the mortality rate for someone who is 65 next year will be slightly less than for someone who is 65 this year. In general, using generational mortality anticipates increases in the cost of the plan over time as participants' life expectancies are projected to increase and is now the established practice within the actuarial profession.

Periodically² RPEC publishes updates to their mortality improvement scales. The twodimensional mortality improvement scale MP-2021 is the latest improvement scale available as of the date of this report.

We recommend the "amount-weighted" tables from the Pub-2016 family of mortality tables be used (adjusted for CCCERA experience as discussed herein), as well as using the "above-median" tables where applicable.



¹ The Pub-2016 family of mortality tables have been developed without experience from the COVID-19 pandemic.

² We understand that RPEC generally publishes an update to their mortality improvement scale annually based on the newest mortality data available. However, the mortality data observed during 2020 was severely impacted by the COVID-19 pandemic and RPEC elected to not release a new mortality improvement scale for 2022, 2023 and 2024 that would have incorporated the substantially higher rate of mortality experience from 2020. Therefore, the MP-2021 remains the most recent mortality improvement scale published.

We continue to recommend that the MP-2021 mortality improvement scale be used and applied generationally where each future year has its own mortality table that reflects the forecasted improvements.

In order to reflect more CCCERA experience in our analysis of the mortality assumption, we have used experience over a **15-year** period by using data from the current experience study period (from January 1, 2021 through December 31, 2023) and the last four experience study periods (from January 1, 2018 through December 31, 2020; from January 1, 2015 through December 31, 2020; from January 1, 2015 through December 31, 2014; and from January 1, 2009 through December 30, 2011).

In 2008 the SOA published an article recommending that mortality assumptions include an adjustment for credibility. Under this approach, the number of deaths needed for full credibility for a headcount-weighted mortality table is just over 1,000,¹ where full credibility means a 90% confidence that the actual experience will be within 5% of the expected value. For CCCERA, the number of actual deaths differs for each cohort and varies from 0 deaths for Safety active females to 1,371 deaths for General healthy retiree females over the 15-year period studied. In our recommended assumptions, we have adjusted the Pub-2016 mortality tables to fit CCCERA's experience based on the partial credibility for each cohort.

Post-retirement mortality (service retirements)

The current mortality tables used for post-retirement mortality are as follows:

- **General members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

The following table shows the observed benefit-weighted deaths for heathy retired members based on the actual experience during the 15-year period. Also shown are the expected benefit-weighted deaths under the current and proposed assumptions. This information is shown separately by gender.

As discussed, we continue to recommend the use of a generational mortality table, which incorporates a more explicit assumption for future mortality improvement. Accordingly, the goal is to start with a mortality table that closely matches the current experience (without a margin for future mortality improvement), and then reflect mortality improvement by projecting lower mortality rates in future years. As shown in the table below, the proposed mortality tables have an actual to expected ratio of 99% and 106% for General and Safety, respectively, after adjustments for partial credibility. In future years the ratios should remain around these levels as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.



¹ The number of deaths needed for full credibility for an "amount" weighted mortality table is generally higher and based on the dispersion of the benefit amount for a given retiree group.

Healthy Retiree Mortality Experience – Benefit-Weighted (\$ in millions)

Gender	General Current Expected Weighted Deaths	General Actual Weighted Deaths	General Proposed Expected Weighted Deaths	Safety Current Expected Weighted Deaths	Safety Actual Weighted Deaths	Safety Proposed Expected Weighted Deaths
Male	\$35.63	\$34.68	\$35.66	\$23.62	\$24.69	\$22.58
Female	36.60	38.64	38.71	1.95	1.27	1.92
Total	\$72.23	\$73.32	\$74.37	\$25.57	\$25.96	\$24.50
Actual / Expected	102%		99% ¹	102%		106%²

Notes:

- 1. Experience shown above is weighted by annual benefit amounts for deceased members.
- 2. Expected amounts under the current and proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the year the death occurred (or was expected to occur).
- 3. Results may not add due to rounding.

Based on standard statistical theory, the data used in our analysis is only partially credible under the recommended "amount-weighted" basis when dispersion of retirees' benefit amounts is considered, particularly for the Safety membership groups. Therefore, the proposed mortality tables reflect only a partial adjustment for actual CCCERA experience.

We recommend updating the mortality tables used for post-retirement mortality to the following:

- **General members:** Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Chart 5 on page 43 compares the actual to expected deaths on an amount-weighted basis for General service retirement members over the 15-year period for the current and proposed assumptions.



¹ If we used the benchmark Pub-2016 General Healthy Retiree table without any adjustment, the proposed actual to expected ratio would be 101%.

² If we used the benchmark Pub-2016 Safety Healthy Retiree table without any adjustment, the proposed actual to expected ratio would be 110%.

Chart 6 on page 43 compares the actual to expected deaths on an amount-weighted basis for Safety service retirement members over the 15-year period for the current and proposed assumptions.

Chart 7 and Chart 8 on page 44 show the life expectancies (i.e., expected future lifetime) under the current and proposed tables for General service retirement members and Safety service retirement members, respectively, on an amount-weighted basis. Life expectancies under the current and proposed generational mortality rates are based on age as of 2025. In practice, assumed life expectancies will increase in accordance with the mortality improvement scale.

Beneficiary Mortality

The current mortality tables used for beneficiary mortality are as follows:

- **Beneficiaries not in pay status as of valuation:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.
- Beneficiaries in pay status as of valuation: Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

The Pub-2016 Contingent Survivor mortality tables (as well as the Pub-2010 Contingent Survivor mortality tables) are developed based only on beneficiary data **after** the death of the member. This is consistent with the data that we have available for CCCERA beneficiaries and we have confirmed that the Pub-2016 Contingent Survivor mortality rates are comparable to CCCERA's actual mortality experience for beneficiaries.

Because the Contingent Survivor mortality tables reflect beneficiary mortality experience only **after** the death of the member, in the prior study we recommended the use of two separate mortality tables for beneficiaries, based on the pay status of the beneficiary. In particular, we recommended that the General Healthy Retiree mortality tables be used for beneficiary mortality (both before and after the expected death of the General or Safety member) when calculating the liability for the continuance to a beneficiary of a surviving member. Upon the actual death of the member (i.e., for all beneficiaries in pay status as of the valuation date), we recommended that the Contingent Survivor mortality tables, adjusted for CCCERA experience, be used. We note that the use of different mortality tables (before and after the death of the member) has been found by the RPEC to be reasonable.

The following table shows the observed benefit-weighted deaths for beneficiaries based on the actual experience during the 15 years studied. Also shown are the expected benefit-weighted deaths under the current and proposed assumptions. This information is shown separately by gender. As shown in the table below, the proposed mortality table has an actual to expected ratio of 104% after adjustments for partial credibility. In future years the ratios should remain around these levels as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.



Beneficiary Mortality Experience – Benefit-Weighted (\$ in millions)

Gender	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	\$3.52	\$4.24	\$3.85
Female	20.37	21.57	20.91
Total	\$23.89	\$25.81	\$24.76
Actual / Expected	108%		104% ¹

Notes:

- 1. Experience shown above is weighted by annual benefit amounts for deceased beneficiaries.
- 2. Expected amounts under the current and proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the year the death occurred (or was expected to occur).
- 3. Results may not add due to rounding.

The proposed mortality table reflects current experience to the extent that the experience is credible based on standard statistical theory. For CCCERA, there is less data available for beneficiaries than there is for retirees, so it is given relatively less credibility and the proposed tables are only slightly adjusted.

We recommend updating the mortality table used for beneficiary mortality to the following:

- Not in pay status at the valuation: Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.
- In pay status at the valuation: Pub-2016 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

As noted above, we continued to recommend the use of separate mortality tables for beneficiaries before and after the **actual** death of the member.

¹ If we used the benchmark Pub-2016 Contingent Survivor table without any adjustment, the proposed actual to expected ratio would be 109%.



Pre-retirement mortality

The current mortality tables used for pre-retirement mortality are as follows:

- **General members:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

The table below shows the observed salary-weighted deaths for active members based on the actual experience during the 15 years studied. Also shown are the expected salary-weighted deaths under the current and proposed assumptions. This information is shown separately by gender. As shown in the table below, the proposed mortality tables have an actual to expected ratio of 88% and 86% for General and Safety, respectively, after adjustments for partial credibility. In future years the ratios should remain around these levels as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

Gender	General Current Expected Weighted Deaths	General Actual Weighted Deaths	General Proposed Expected Weighted Deaths	Safety Current Expected Weighted Deaths	Safety Actual Weighted Deaths	Safety Proposed Expected Weighted Deaths
Male	\$4.41	\$3.84	\$4.37	\$1.54	\$1.52	\$1.58
Female	5.56	5.13	5.77	0.18	0.00	0.19
Total	\$9.97	\$8.97	\$10.14	\$1.72	\$1.52	\$1.77
Actual / Expected	90%		88% ¹	88%		86%

Pre-Retirement Mortality Experience – Salary-Weighted (\$ in millions)

Notes:

- 1. Experience shown above is weighted by annual salary for deceased members.
- 2. Expected amounts under the current and proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the year the death occurred (or was expected to occur).
- 3. Results may not add due to rounding.

The proposed mortality tables reflect current experience to the extent that the experience is credible based on standard statistical theory. For many plans, there is generally less mortality experience available for actives, so it is given little credibility and the proposed tables are only slightly adjusted.

¹ If we used the benchmark Pub-2016 General Employee table without any adjustment, the proposed actual to expected ratio would be 84%.



We recommend updating the mortality tables used for pre-retirement mortality to the following:

- **General members:** Pub-2016 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates decreased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2016 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Currently, our assumption is that all General and Safety member pre-retirement deaths are nonservice connected. Based on the actual experience during the last three years of 32 total deaths, four were due to service-connected causes. **We recommend maintaining the current assumption that all pre-retirement deaths are non-service-connected deaths.** We will continue to monitor this assumption.

Mortality table for member contributions, optional forms of payment and reserves

There are administrative reasons why a generational mortality table is more difficult to implement for determining member contributions for the legacy tiers (i.e., non-PEPRA), optional forms of payment and reserves. For determining member contributions, one emerging practice is to approximate the use of a generational mortality table by the use of a static table with projection of the mortality improvement from the measurement year over a period that is close to the duration of the benefit payments for active legacy members. We recommend the use of this approximation for determining member contributions for employees in the legacy tiers.

We recommend updating the mortality tables used for determining contributions to the following:

- **General members:** Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected 30 years (from 2016) with the two-dimensional mortality improvement scale MP-2021, weighted 30% male and 70% female.
- **Safety members:** Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected 30 years (from 2016) with the two-dimensional mortality improvement scale MP-2021, weighted 85% male and 15% female.

For optional forms of payment and reserves, there are administrative issues that we may need to resolve with CCCERA and its vendor maintaining the pension administration software before we can recommend a comparable generational scale to anticipate future mortality improvement. We will provide a recommendation to CCCERA for use in reflecting mortality improvement for determining optional forms of payment after we have those discussions with CCCERA and its vendor.



Chart 5: Post-Retirement Benefit-Weighted Deaths (\$ in millions) General Service Retired Members (January 1, 2009 through December 31, 2023)



Chart 6: Post-Retirement Benefit-Weighted Deaths (\$ in millions) Safety Service Retired Members (January 1, 2009 through December 31, 2023)







Chart 7: Benefit-Weighted Life Expectancies for Age in 2025 General Service Retired Members



Chart 8: Benefit-Weighted Life Expectancies for Age in 2025 Safety Service Retired Members





B. Mortality rates — disabled

Since mortality rates for disabled members can vary from those of healthy members, a different mortality assumption is often used.

The current mortality tables used for disabled mortality are as follows:

- **General members:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2021.

The following table shows the observed benefit-weighted deaths for disability retired members based on the actual experience during the 15 years studied. Also shown are the expected benefit-weighted deaths under the current and proposed assumptions. This information is shown separately by gender.

The proposed mortality tables have an actual to expected ratio of 107% and 101% for General and Safety, respectively, after adjustments for partial credibility. In future years the ratios should remain around these levels as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

Disabled Retiree Mortality Experience – Benefit-Weighted (\$ in millions)

Gender	General Current Expected Weighted Deaths	General Actual Weighted Deaths	General Proposed Expected Weighted Deaths	Safety Current Expected Weighted Deaths	Safety Actual Weighted Deaths	Safety Proposed Expected Weighted Deaths
Male	\$2.96	\$2.85	\$2.55	\$9.13	\$9.46	\$9.13
Female	4.55	4.50	4.30	0.47	0.30	0.49
Total	\$7.51	\$7.35	\$6.85	\$9.60	\$9.76	\$9.62
Actual / Expected	98%		107% ¹	102%		101% ²

Notes:

- 1. Experience shown above is weighted by annual benefit amounts for deceased members.
- 2. Expected amounts under the current and proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the year the death occurred (or was expected to occur).
- 3. Results may not add due to rounding.
- ¹ If we used the benchmark Pub-2016 Non-Safety Disabled Retiree table without any adjustment, the proposed actual to expected ratio would be 113%.
- ² If we used the benchmark Pub-2016 Safety Disabled Retiree table without any adjustment, the proposed actual to expected ratio would remain at 106%.



Similar to mortality rates for service retirees, the proposed mortality tables reflect current experience to the extent that the experience is credible based on standard statistical theory. For CCCERA, there is much less data available for disabled retirees, so it is given little credibility and the proposed tables are only slightly adjusted.

We recommend updating the mortality tables used for disabled mortality to the following:

- **General members:** Pub-2016 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2016 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Chart 9 on page 47 compares the actual to expected deaths on an amount-weighted basis for General disabled retirement members over the 15-year period for the current and proposed assumptions.

Chart 10 on page 47 compares the actual to expected deaths on an amount-weighted basis for Safety disabled retirement members over the 15-year period for the current and proposed assumptions.

Chart 11 and Chart 12 on page 48 show the life expectancies (i.e., expected future lifetime) under the current and proposed tables for General disabled retirement members and Safety disabled retirement members, respectively, on an amount-weighted basis. Life expectancies under the current and proposed generational mortality rates are based on age as of 2025. In practice, assumed life expectancies will increase in accordance with the mortality improvement scale.



Chart 9: Post-Retirement Benefit-Weighted Deaths (\$ in millions) General Disabled Members (January 1, 2009 through December 31, 2023)







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Chart 11: Benefit-Weighted Life Expectancies for Age in 2025 General Disabled Members







C. Disability incidence rates

When a member becomes disabled, he or she may be entitled to at least a 40% or 50% of pay pension depending on tier (service-connected disability), or a pension that depends upon the member's years of service (non-service-connected disability).

The following tables show the observed disability incidence rates based on actual experience over the past three years. Given the overall low level of disability incidence, we have also included and considered the actual experience over the past **twelve** years. Also shown are the current assumed rates and the rates we propose. Please note that we have combined service-connected disability incidence in the tables below.

Age	Current Rate	Actual Rate (3 Years)	Actual Rate (12 Years)	Proposed Rate
20 – 24	0.01%	0.00%	0.00%	0.00%
25 – 29	0.02%	0.00%	0.00%	0.00%
30 – 34	0.05%	0.00%	0.00%	0.03%
35 – 39	0.10%	0.00%	0.00%	0.06%
40 – 44	0.30%	0.00%	0.10%	0.20%
45 – 49	0.40%	0.32%	0.40%	0.40%
50 – 54	0.60%	0.00%	0.59%	0.60%
55 – 59	0.60%	0.00%	0.14%	0.60%
60 - 64	0.60%	0.56%	0.37%	0.60%
65 – 69	0.60%	0.00%	1.20%	0.60%
70 and over	0.60%	0.00%	3.64%	0.60%
Actual / Expected (12 Years)	0.74			0.78

General Tier 1 and Tier 4 – Disability Incidence Rates

Due to limited recent experience (there were only 2 actual disabilities for General Tier 1 and Tier 4 members in the last 3 years), we have relied primarily upon the actual experience over the past 12 years to recommend decreases in the disability incidence rate assumption for General Tier 1 and Tier 4 members.

Chart 13 on page 53 compares the number of actual disabilities for General Tier 1 and Tier 4 members over the past three years to the current and proposed assumptions.

Chart 14 on page 53 compares the actual disability incidence experience for General Tier 1 and Tier 4 members with the current and proposed assumptions.



Age	Current Rate	Actual Rate (3 Years)	Actual Rate (12 Years)	Proposed Rate
20 – 24	0.01%	0.00%	0.00%	0.00%
25 – 29	0.02%	0.00%	0.00%	0.00%
30 – 34	0.04%	0.00%	0.00%	0.02%
35 – 39	0.06%	0.00%	0.01%	0.04%
40 – 44	0.08%	0.06%	0.06%	0.07%
45 – 49	0.10%	0.00%	0.08%	0.09%
50 – 54	0.14%	0.14%	0.10%	0.14%
55 – 59	0.18%	0.03%	0.10%	0.14%
60 - 64	0.18%	0.09%	0.17%	0.14%
65 – 69	0.18%	0.10%	0.03%	0.14%
70 and over	0.18%	0.00%	0.12%	0.14%
Actual / Expected (12 Years)	0.64			0.78

General Tier 3 and Tier 5 – Disability Incidence Rates

Based on the recent experience, along with the actual experience over the past 12 years, we recommend decreases in the disability incidence rate assumption for General Tier 3 and Tier 5 members.

Chart 15 on page 54 compares the number of actual disabilities for General Tier 3 and Tier 5 members over the past three years to the current and proposed assumptions.

Chart 16 on page 54 compares the actual disability incidence experience for General Tier 3 and Tier 5 members with the current and proposed assumptions.



Age	Current Rate	Actual Rate (3 Years)	Actual Rate (12 Years)	Proposed Rate
20 – 24	0.10%	0.00%	0.00%	0.10%
25 – 29	0.20%	0.00%	0.00%	0.10%
30 – 34	0.40%	0.48%	0.35%	0.40%
35 – 39	0.50%	0.63%	0.54%	0.55%
40 - 44	0.60%	1.20%	0.68%	0.65%
45 – 49	1.20%	0.70%	0.96%	1.10%
50 – 54	4.00%	2.03%	3.71%	3.75%
55 – 59	4.00%	3.33%	3.60%	3.75%
60 - 64	4.50%	3.26%	3.85%	4.25%
65 – 69	4.50%	10.00%	5.71%	5.00%
70 and over	4.50%	0.00%	12.50%	5.00%
Actual / Expected (12 Years)	0.91			0.95

Safety – Disability Incidence Rates

Based on the recent experience, along with the actual experience over the past 12 years, we recommend an overall decrease in the disability incidence rate assumption for Safety members.

Chart 17 on page 55 compares the number of actual disabilities for Safety members over the past three years to the current and proposed assumptions.

Chart 18 on page 55 compares the actual disability incidence experience for Safety members with the current and proposed assumptions.

Service-connected vs. non-service-connected disability

The following table shows the observed percentage of new disabled members that received a service-connected disability based on the actual experience over the past three years as well as the actual experience over the past 12 years. Also shown are the current and proposed assumptions.

Disabled Members Receiving a Service-Connected Disability

Line Description	General Tier 1 and Tier 4	General Tier 3 and Tier 5	Safety
Current assumption	65%	25%	100%
Actual percentage (3 Years)	100% ¹	27%	98%
Actual percentage (12 Years)	68%	22%	96%
Proposed assumption	70%	25%	100%

¹ There were only 2 actual disabilities for General Tier 1 and Tier 4 members during the past three years.



Based on the recent experience, along with the actual experience over the past 12 years, we recommend increasing the assumption for future disabled General Tier 1 and Tier 4 members receiving a service-connected disability to 70%. We recommend maintaining the assumptions for General Tier 3 and Tier 5 members at 25% and for Safety members at 100%. The remaining percentages are assumed to be non-service-connected disabilities (30% for General Tier 1 and Tier 4 members, 75% for General Tier 3 and Tier 5 members, and 0% for Safety members).



Chart 13: Actual Number of Disability Retirements Compared to Expected General Tier 1 and Tier 4 Members



Chart 14: Disability Incidence Rates General Tier 1 and Tier 4 Members



Chart 15: Actual Number of Disability Retirements Compared to Expected General Tier 3 and Tier 5 Members



Chart 16: Disability Incidence Rates General Tier 3 and Tier 5 Members



Chart 17: Actual Number of Disability Retirements Compared to Expected Safety Members



Chart 18: Disability Incidence Rates Safety Members





D. Termination rates

Termination rates include all terminations for reasons other than death, disability, or retirement.

Under the current assumptions there is an overall incidence of termination assumed, combined with an assumption that a member will choose between a refund of member contributions and a deferred vested benefit based on which option is more valuable, measured by its present value at the date of the member's termination. Furthermore, the termination rates are based as a function of the member's years of service and are applied until the member is first assumed to retire. That is, we assume that members eligible to retire at termination will retire in accordance with the retirement rate assumptions rather than terminate and defer their benefit. **With this study, we continue to recommend that this same assumption structure be used.**

We have also reviewed the actual experience for Legacy and PEPRA members separately. Based on our review, we continue to propose that one set of termination rates be used for all General members and one set of termination rates be used for all Safety members.

The following tables show the observed¹ termination rates based on the actual experience over the past three years. To increase the credibility of the data, particularly for Safety members, we have also included and considered the actual experience over the past **six** years. Also shown are the current assumed rates and the rates we propose.

¹ We have excluded any members that were eligible for retirement.


Years of Service	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
Less than 1	14.00%	15.70%	14.94%	14.50%
1 – 2	9.50%	12.19%	10.92%	10.50%
2 – 3	9.00%	11.68%	9.97%	9.50%
3 – 4	6.25%	8.54%	7.13%	7.00%
4 – 5	6.25%	6.91%	6.60%	6.50%
5 – 6	5.00%	7.40%	6.28%	6.00%
6 – 7	4.50%	6.99%	5.93%	5.50%
7 – 8	4.00%	5.80%	4.61%	5.00%
8 – 9	3.75%	6.94%	5.51%	5.00%
9 –10	3.75%	3.94%	3.97%	4.00%
10 – 11	3.50%	5.91%	5.12%	4.00%
11 – 12	3.25%	4.64%	4.45%	4.00%
12 – 13	2.75%	4.61%	3.32%	3.00%
13 – 14	2.50%	2.97%	2.06%	2.50%
14 – 15	2.50%	2.98%	2.77%	2.50%
15 – 16	2.25%	3.49%	3.05%	2.50%
16 – 17	2.25%	4.69%	3.56%	2.50%
17 – 18	2.00%	1.66%	1.31%	1.75%
18 – 19	2.00%	1.65%	1.66%	1.75%
19 – 20	1.50%	2.59%	2.03%	1.50%
20 and over	1.50%	1.80%	2.09%	1.50%
Actual / Expected (6 Years)	1.14			1.04

General – Termination Rates

Based on this experience, we recommend increasing the termination rates at most years of service for General members.

It is important to note that not every years of service category has enough exposures and/or decrements such that the results for that category are statistically credible even when looking at six years' worth of experience. This is mainly the case for the higher service categories, since most members in those categories are eligible to retire and therefore have been excluded from our review of termination experience.

Chart 19 on page 59 compares the number of actual to expected terminations for General members over the past three years for the current and proposed assumptions.

Chart 20 on page 59 compares the actual terminations experience for General members with the current and proposed assumptions.



Years of Service	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
Less than 1	11.00%	6.49%	7.87%	9.00%
1 – 2	9.00%	5.46%	5.46%	7.00%
2 – 3	7.00%	5.06%	5.83%	6.00%
3 – 4	5.00%	4.52%	3.78%	5.00%
4 – 5	4.00%	3.20%	1.91%	3.50%
5 – 6	3.50%	3.66%	3.54%	3.50%
6 – 7	3.00%	2.44%	1.69%	3.00%
7 – 8	2.50%	4.50%	3.17%	2.50%
8 – 9	2.50%	1.05%	0.68%	2.25%
9 –10	2.00%	1.20%	1.05%	2.00%
10 – 11	2.00%	1.72%	1.50%	2.00%
11 – 12	2.00%	2.38%	0.75%	2.00%
12 – 13	2.00%	2.04%	2.30%	2.00%
13 – 14	1.80%	2.29%	1.55%	1.80%
14 – 15	1.60%	0.62%	0.38%	1.50%
15 – 16	1.50%	0.70%	0.36%	1.40%
16 – 17	1.40%	0.96%	1.15%	1.30%
17 – 18	1.30%	2.38%	0.84%	1.20%
18 – 19	1.20%	1.02%	0.42%	1.10%
19 – 20	1.00%	0.91%	1.12%	1.00%
20 or more	0.50%	0.00%	0.00%	0.25%
Actual / Expected (6 Years)	0.70			0.78

Safety — Termination Rates

Based on this experience, we recommend decreasing the termination rates at most years of service for Safety members.

For Safety members it is especially important to note that due to the overall low level of termination, many of the years of service category do not have enough decrements to be statistically credible. Therefore, while we are recommending decreases based on the actual rates we have seen over the past six years, we have not decreased the rates (after considering credibility) by as much as the actual rates may seem to imply.

Chart 21 on page 60 compares the number of actual to expected terminations for Safety members over the past three years for the current and proposed assumptions.

Chart 22 on page 60 compares the actual withdrawal experience for Safety members under the current and proposed assumptions.











Chart 21: Actual Number of Terminations Compared to Expected Safety Members





E. Retirement rates

The age at which a member retires from service (i.e., who did not retire on a disability pension) will affect both the amount of the benefits that will be paid to that member as well as the period over which funding must take place.

Continuing the practice adopted in the last experience study, the recommended retirement rates for General Tier 1 Enhanced, General Tier 3 Enhanced and Safety Tier A Enhanced apply different sets of age-based retirement assumptions for members with less than 30 years of service and for members with more than 30 years of service. For the first time in this experience study, we recommend retirement rates for General Tier 4 and Tier 5 also be applied using different sets of age-based retirement assumptions for members with less than 30 years of service and for members with more than 30 years of service so that they would follow the retirement rate structure for the General Legacy members. For all other tiers, we continue to recommend retirement rates as a function of age only due to the limited experience available.

On January 1, 2013, PEPRA formulas were implemented for new General and Safety tiers. These new tiers are referred to as Tier 4 and Tier 5 for General, and Tier D and Tier E for Safety. With this study, we are introducing service-based retirement rates for the General Tier 4 and Tier 5 members as well as adjusting the current assumptions based on actual experience. However, there is still relatively limited experience available for these tiers, so there continues to be some smoothing of the proposed rates at most ages. This assumption will continue to be monitored in future experience studies, including whether service-based retirement rates should also be implemented for Safety Tier D and Tier E.

The following tables shows the observed service retirement rates based on the actual experience over the past three years. To increase the credibility of the data, we have also included and considered the actual experience over the past **six** years. Also shown are the current assumed rates and the rates we propose.



General Tier 1 Enhanced – Retirement Rates by Years of Service (YOS)

Age	<30 YOS Current Rate	<30 YOS Actual Rate (3 Years)	<30 YOS Actual Rate (6 Years)	<30 YOS Proposed Rate	30+ YOS Current Rate	30+ YOS Actual Rate (3 Years)	30+ YOS Actual Rate (6 Years)	30+ YOS Proposed Rate
50	4.00%	11.90%	8.33%	4.00%	10.00%	N/A	0.00%	8.00%
51	4.00%	6.67%	3.41%	4.00%	10.00%	0.00%	25.00%	10.00%
52	4.00%	2.50%	5.15%	4.00%	10.00%	0.00%	16.67%	10.00%
53	4.00%	4.65%	2.91%	4.00%	10.00%	0.00%	0.00%	10.00%
54	10.00%	2.50%	4.08%	8.00%	16.00%	25.00%	7.69%	16.00%
55	15.00%	9.76%	12.22%	12.00%	24.00%	46.15%	39.13%	30.00%
56	15.00%	5.13%	8.43%	12.00%	24.00%	25.00%	14.29%	24.00%
57	15.00%	12.82%	12.66%	14.00%	24.00%	11.11%	16.67%	22.00%
58	15.00%	15.15%	9.23%	15.00%	22.00%	44.44%	26.32%	22.00%
59	18.00%	9.68%	14.04%	18.00%	22.00%	22.22%	20.00%	22.00%
60	20.00%	22.22%	22.22%	20.00%	20.00%	30.00%	19.05%	20.00%
61	20.00%	22.22%	15.22%	20.00%	20.00%	50.00%	26.09%	20.00%
62	25.00%	15.79%	22.00%	22.00%	30.00%	0.00%	17.65%	25.00%
63	25.00%	15.38%	23.68%	22.00%	30.00%	33.33%	40.00%	30.00%
64	25.00%	7.14%	17.86%	22.00%	30.00%	11.11%	9.09%	30.00%
65	35.00%	26.32%	24.14%	30.00%	35.00%	14.29%	23.08%	30.00%
66	40.00%	50.00%	47.62%	40.00%	40.00%	100.00%	37.50%	30.00%
67	40.00%	60.00%	36.36%	40.00%	40.00%	N/A	16.67%	30.00%
68	40.00%	75.00%	55.56%	40.00%	40.00%	0.00%	0.00%	30.00%
69	40.00%	0.00%	16.67%	40.00%	40.00%	20.00%	16.67%	30.00%
70	40.00%	100.00%	66.67%	40.00%	40.00%	0.00%	0.00%	30.00%
71	35.00%	0.00%	0.00%	35.00%	35.00%	50.00%	50.00%	35.00%
72	35.00%	50.00%	25.00%	35.00%	35.00%	100.00%	100.00%	35.00%
73	35.00%	50.00%	33.33%	35.00%	35.00%	N/A	N/A	35.00%
74	35.00%	50.00%	50.00%	35.00%	35.00%	N/A	N/A	35.00%
75+	100.00%	0.00%	33.33%	100.00%	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	0.84			0.91	0.84			0.89

Based on this experience, we recommend decreasing the retirement rates overall for General Tier 1 Enhanced members with less than 30 years of service and with 30 or more years of service.

Chart 23 on page 70 compares the number of actual to expected retirements for General Tier 1 Enhanced members over the past three years for the current and proposed assumptions.

Chart 29 and Chart 30 on page 73 compare the actual retirement experience with the current and proposed assumptions for General Tier 1 Enhanced members with less than 30 years of service and with 30 or more years of service, respectively.



General Tier 3 Enhanced – Retirement Rates by Years of Service (YOS)

Age	<30 YOS Current Rate	<30 YOS Actual Rate (3 Years)	<30 YOS Actual Rate (6 Years)	<30 YOS Proposed Rate	30+ YOS Current Rate	30+ YOS Actual Rate (3 Years)	30+ YOS Actual Rate (6 Years)	30+ YOS Proposed Rate
49	0.00%	N/A	N/A	0.00%	25.00%	N/A	100.00%	25.00%
50	4.00%	4.10%	3.58%	4.00%	10.00%	0.00%	0.00%	10.00%
51	3.00%	2.41%	2.27%	3.00%	5.00%	0.00%	0.00%	5.00%
52	3.00%	4.72%	4.02%	3.25%	5.00%	7.14%	8.00%	5.00%
53	4.00%	3.45%	2.83%	3.50%	5.00%	4.76%	5.71%	5.00%
54	6.00%	5.77%	4.47%	5.75%	11.00%	10.34%	11.54%	11.00%
55	8.00%	6.38%	8.23%	8.00%	15.00%	8.57%	13.24%	15.00%
56	8.00%	8.64%	8.03%	8.00%	10.00%	13.16%	13.41%	10.00%
57	8.00%	7.89%	6.72%	8.00%	10.00%	6.82%	8.14%	10.00%
58	9.00%	8.43%	7.99%	8.50%	15.00%	11.76%	16.49%	15.00%
59	10.00%	13.92%	11.34%	10.00%	15.00%	27.87%	26.60%	20.00%
60	12.00%	6.94%	9.15%	11.00%	15.00%	11.11%	16.00%	15.00%
61	16.00%	13.50%	13.05%	16.00%	20.00%	21.43%	15.58%	18.00%
62	20.00%	21.79%	18.89%	20.00%	25.00%	33.33%	25.00%	25.00%
63	20.00%	21.20%	17.30%	20.00%	25.00%	23.33%	14.93%	25.00%
64	25.00%	15.34%	20.06%	20.00%	28.00%	25.00%	23.44%	25.00%
65	30.00%	27.85%	26.47%	30.00%	32.00%	39.39%	37.04%	32.00%
66	32.00%	35.21%	35.47%	32.00%	32.00%	33.33%	28.13%	32.00%
67	30.00%	38.04%	33.85%	32.00%	30.00%	20.00%	35.29%	30.00%
68	30.00%	25.00%	29.05%	30.00%	30.00%	41.67%	35.71%	30.00%
69	30.00%	38.00%	36.04%	30.00%	30.00%	0.00%	25.00%	30.00%
70	35.00%	35.42%	36.28%	35.00%	35.00%	60.00%	50.00%	30.00%
71	35.00%	36.67%	22.54%	30.00%	35.00%	50.00%	25.00%	30.00%
72	35.00%	24.00%	25.86%	30.00%	35.00%	0.00%	0.00%	30.00%
73	35.00%	13.04%	15.79%	30.00%	35.00%	0.00%	0.00%	30.00%
74	35.00%	23.81%	18.75%	30.00%	35.00%	0.00%	0.00%	30.00%
75+	100.00%	30.30%	25.71%	100.00%	100.00%	25.00%	33.33%	100.00%
Actual / Expected (6 Years)	0.88			0.91	0.99			0.99

Based on this experience, we recommend decreasing the retirement rates overall for General Tier 3 Enhanced members with less than 30 years of service and minor adjustments to the General Tier 3 Enhanced members with 30 or more years of service.

Chart 24 on page 70 compares the number of actual to expected retirements for General Tier 3 Enhanced members over the past three years for the current and proposed assumptions.

Chart 31 and Chart 32 on page 74 compare the actual retirement experience with the current and proposed assumptions for General Tier 3 Enhanced members with less than 30 years of service and with 30 or more years of service, respectively.



Age	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
50	3.00%	N/A	0.00%	3.00%
51	3.00%	N/A	0.00%	3.00%
52	3.00%	0.00%	0.00%	3.00%
53	3.00%	0.00%	0.00%	3.00%
54	3.00%	0.00%	0.00%	3.00%
55	10.00%	N/A	N/A	10.00%
56	10.00%	N/A	N/A	10.00%
57	10.00%	N/A	N/A	10.00%
58	10.00%	N/A	0.00%	10.00%
59	10.00%	100.00%	66.67%	10.00%
60	25.00%	N/A	0.00%	25.00%
61	15.00%	0.00%	0.00%	15.00%
62	40.00%	100.00%	100.00%	40.00%
63	35.00%	0.00%	0.00%	35.00%
64	30.00%	N/A	N/A	30.00%
65	40.00%	N/A	N/A	40.00%
66	35.00%	N/A	N/A	35.00%
67	35.00%	N/A	N/A	35.00%
68	35.00%	N/A	N/A	35.00%
69	35.00%	N/A	N/A	35.00%
70	40.00%	N/A	N/A	35.00%
71	40.00%	N/A	N/A	35.00%
72	40.00%	N/A	N/A	35.00%
73	50.00%	N/A	N/A	35.00%
74	50.00%	N/A	N/A	35.00%
75+	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	1.62			1.62

General Tier 1 Non-Enhanced – Retirement Rates

The General Tier 1 Non-Enhanced formula covers a very small group of members, with only two actual retirements observed in the past three years (and only six actual retirements observed in the past 12 years). Due to the size of this tier, we have only recommended decreasing some of the retirement rates in the later ages to be consistent with similar changes we are recommending for other General members.



General Tier 4 and Tier 5 – Retirement Rates by Years of Service (YOS)

Age	<30 YOS Current Rate	<30 YOS Actual Rate (3 Years)	<30 YOS Actual Rate (6 Years)	<30 YOS Proposed Rate	30+ YOS Current Rate	30+ YOS Actual Rate (3 Years)	30+ YOS Actual Rate (6 Years)	30+ YOS Proposed Rate
52	2.00%	3.15%	2.78%	2.00%	2.00%	N/A	N/A	2.00%
53	3.00%	0.00%	0.82%	2.00%	3.00%	N/A	N/A	3.00%
54	3.00%	1.01%	1.60%	2.00%	3.00%	N/A	N/A	3.00%
55	4.00%	0.00%	0.00%	2.00%	4.00%	N/A	N/A	4.00%
56	5.00%	1.20%	0.93%	3.00%	5.00%	N/A	N/A	5.00%
57	6.00%	7.21%	7.97%	6.00%	6.00%	N/A	N/A	6.00%
58	6.00%	5.08%	4.96%	6.00%	6.00%	N/A	N/A	6.00%
59	8.00%	3.88%	3.15%	6.00%	8.00%	N/A	N/A	8.00%
60	8.00%	4.49%	4.59%	7.00%	8.00%	N/A	N/A	8.00%
61	12.00%	7.69%	9.91%	10.00%	12.00%	N/A	N/A	12.00%
62	15.00%	3.80%	3.85%	12.00%	15.00%	N/A	N/A	15.00%
63	17.00%	10.47%	10.91%	14.00%	17.00%	N/A	N/A	17.00%
64	20.00%	11.11%	13.33%	16.00%	20.00%	N/A	N/A	20.00%
65	25.00%	15.19%	17.53%	20.00%	25.00%	N/A	N/A	25.00%
66	25.00%	28.30%	26.76%	25.00%	25.00%	N/A	N/A	25.00%
67	25.00%	22.73%	22.64%	25.00%	25.00%	N/A	N/A	25.00%
68	25.00%	21.43%	17.65%	25.00%	25.00%	N/A	N/A	25.00%
69	25.00%	3.85%	7.14%	25.00%	25.00%	N/A	N/A	25.00%
70	35.00%	10.00%	7.69%	25.00%	35.00%	N/A	N/A	30.00%
71	35.00%	16.67%	23.08%	30.00%	35.00%	N/A	N/A	30.00%
72	35.00%	14.29%	18.18%	30.00%	35.00%	N/A	N/A	30.00%
73	35.00%	0.00%	0.00%	30.00%	35.00%	N/A	N/A	30.00%
74	35.00%	20.00%	11.11%	30.00%	35.00%	N/A	N/A	30.00%
75+	100.00%	33.33%	23.08%	100.00%	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	0.59			0.68	N/A			N/A

Based on this experience, we recommend decreasing the retirement rates overall for General Tier 4 and Tier 5 members with less than 30 years of service. While there were no actual retirements during this period for General Tier 4 and Tier 5 members with 30 or more years of service, we recommend decreasing the rates for ages 70 to 74 to be consistent with similar recommendations in the other tiers.

Chart 25 on page 71 compares the number of actual to expected retirements for General Tier 4 and Tier 5 members over the past three years for the current and proposed assumptions.

Chart 33 and Chart 34 on page 75 compare the actual retirement experience with the current and proposed assumptions for General Tier 4 and Tier 5 members with less than 30 years of service and with 30 or more years of service, respectively.



Safety Tier A Enhanced — Retirement Rates by Years of Service (YOS)

Age	<30 YOS Current Rate	<30 YOS Actual Rate (3 Years)	<30 YOS Actual Rate (6 Years)	<30 YOS Proposed Rate	30+ YOS Current Rate	30+ YOS Actual Rate (3 Years)	30+ YOS Actual Rate (6 Years)	30+ YOS Proposed Rate
43	0.00%	15.79%	15.79%	5.00%	0.00%	N/A	N/A	0.00%
44	0.00%	15.38%	11.11%	5.00%	0.00%	N/A	N/A	0.00%
45	7.00%	0.00%	0.00%	5.00%	7.00%	N/A	N/A	0.00%
46	5.00%	4.08%	7.69%	5.00%	5.00%	N/A	N/A	0.00%
47	7.00%	3.57%	3.88%	5.00%	7.00%	N/A	N/A	0.00%
48	10.00%	9.59%	10.29%	10.00%	30.00%	N/A	N/A	30.00%
49	22.00%	18.92%	19.48%	20.00%	30.00%	N/A	N/A	30.00%
50	22.00%	17.39%	20.66%	22.00%	30.00%	0.00%	0.00%	30.00%
51	22.00%	11.65%	16.10%	20.00%	22.00%	0.00%	0.00%	20.00%
52	16.00%	13.19%	15.61%	16.00%	20.00%	25.00%	16.67%	20.00%
53	16.00%	13.85%	14.07%	16.00%	22.00%	0.00%	25.00%	20.00%
54	16.00%	20.00%	17.82%	16.00%	24.00%	25.00%	33.33%	24.00%
55	16.00%	17.14%	7.89%	16.00%	30.00%	33.33%	30.00%	30.00%
56	18.00%	16.67%	21.31%	18.00%	30.00%	42.86%	40.00%	30.00%
57	18.00%	27.27%	18.33%	18.00%	30.00%	0.00%	0.00%	30.00%
58	20.00%	9.52%	11.90%	18.00%	35.00%	20.00%	28.57%	30.00%
59	20.00%	11.76%	11.11%	18.00%	35.00%	33.33%	40.00%	35.00%
60	20.00%	11.11%	7.14%	18.00%	35.00%	50.00%	33.33%	35.00%
61	20.00%	0.00%	14.81%	20.00%	35.00%	N/A	50.00%	35.00%
62	20.00%	30.77%	23.81%	20.00%	35.00%	0.00%	0.00%	35.00%
63	25.00%	0.00%	14.29%	20.00%	35.00%	0.00%	0.00%	35.00%
64	35.00%	33.33%	33.33%	35.00%	35.00%	50.00%	50.00%	35.00%
65	100.00%	0.00%	0.00%	35.00%	100.00%	50.00%	66.67%	100.00%
66	100.00%	40.00%	18.18%	50.00%	100.00%	100.00%	100.00%	100.00%
67	100.00%	50.00%	33.33%	50.00%	100.00%	N/A	100.00%	100.00%
68	100.00%	50.00%	40.00%	50.00%	100.00%	N/A	N/A	100.00%
69	100.00%	0.00%	0.00%	50.00%	100.00%	N/A	N/A	100.00%
70+	100.00%	100.00%	100.00%	100.00%	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	0.81			0.89	0.91			0.93

Based on this experience, we recommend decreasing the retirement rates overall for Safety Tier A Enhanced members with less than 30 years of service and with 30 or more years of service.

Chart 26 on page 71 compares the number of actual to expected retirements for Safety Tier A Enhanced members over the past three years for the current and proposed assumptions.

Chart 35 and Chart 36 on page 76 compares the actual retirement experience with the current and proposed assumptions for Safety Tier A Enhanced members with less than 30 years of service and with 30 or more years of service, respectively.



Age	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
45	2.00%	0.00%	0.00%	2.00%
46	1.00%	0.00%	0.00%	1.00%
47	4.00%	0.00%	0.00%	4.00%
48	4.00%	N/A	0.00%	4.00%
49	12.00%	100.00%	66.67%	20.00%
50	20.00%	0.00%	20.00%	20.00%
51	18.00%	0.00%	14.29%	12.00%
52	15.00%	0.00%	0.00%	12.00%
53	15.00%	0.00%	0.00%	12.00%
54	18.00%	0.00%	20.00%	18.00%
55	18.00%	0.00%	0.00%	18.00%
56	15.00%	0.00%	0.00%	15.00%
57	15.00%	0.00%	0.00%	15.00%
58	25.00%	0.00%	0.00%	15.00%
59	25.00%	50.00%	50.00%	25.00%
60	25.00%	0.00%	0.00%	25.00%
61	25.00%	N/A	100.00%	25.00%
62	25.00%	N/A	N/A	25.00%
63	30.00%	N/A	N/A	30.00%
64	35.00%	N/A	N/A	35.00%
65+	100.00%	100.00%	100.00%	100.00%
Actual / Expected (6 Years)	0.87			0.94

Safety Tier C Enhanced — Retirement Rates

The Safety Tier C Enhanced formula covers a relatively small group of members, with only four actual retirements observed in the past three years (and only eight actual retirements observed in the past 12 years). **Due to the size of this tier, we have only recommended moderate changes to some of the retirement rates, for an overall decrease in retirement rates.**

Chart 27 on page 72 compares the number of actual to expected retirements for Safety Tier C members over the past three years for the current and proposed assumptions.

Chart 37 on page 77 compares the actual retirement experience with the current and proposed assumptions for Safety Tier C members.

Safety Tier A Non-Enhanced, Tier D and Tier E – Retirement Rates

Age	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
50	5.00%	0.00%	0.00%	5.00%
51	4.00%	0.00%	0.00%	4.00%
52	4.00%	0.00%	0.00%	4.00%
53	5.00%	12.50%	7.69%	6.00%
54	6.00%	11.11%	10.00%	8.00%
55	15.00%	28.57%	37.50%	20.00%
56	15.00%	40.00%	28.57%	20.00%
57	15.00%	25.00%	16.67%	15.00%
58	15.00%	16.67%	10.00%	15.00%
59	20.00%	25.00%	28.57%	22.00%
60	20.00%	40.00%	33.33%	25.00%
61	20.00%	33.33%	25.00%	25.00%
62	20.00%	66.67%	50.00%	35.00%
63	20.00%	50.00%	50.00%	40.00%
64	25.00%	100.00%	100.00%	40.00%
65+	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	1.47			1.19

The Safety Tier A Non-Enhanced formula covers a relatively small group of members, with only three actual retirements observed in the past three years (and only seven actual retirements observed in the past 12 years). We continue to recommend applying the same retirement rates to the Safety Tier A Non-Enhanced members that are used for the Safety Tier D and Tier E members.

Based on the above experience, we recommend increasing the retirement rates overall for Safety Tier A Non-Enhanced, Tier D and Tier E members.

Chart 28 on page 72 compares the number of actual to expected retirements for Safety Tier A Non-Enhanced, Tier D and Tier E members over the past three years for the current and proposed assumptions.

Chart 38 on page 77 compares the actual retirement experience with the current and proposed assumptions for Safety Tier A Non-Enhanced, Tier D and Tier E members.



Deferred vested members

In the last experience study, separate deferred vested retirement ages were introduced for reciprocal and non-reciprocal members.

The following tables show the observed deferred vested retirement age based on the actual experience over the past **six** years, separately for those who went on to work at a reciprocal retirement system and those that did not. Also shown are the current assumed retirement ages and the retirement ages we propose.

Line Description	Reciprocal Members	Non-Reciprocal Members
Current assumption	60.0	60.0
Actual average age (3 Years)	61.8	60.8
Actual average age (6 Years)	61.1	60.2
Proposed assumption	61.0	60.0

General Members' Deferred Vested Retirement Age

Based on this experience, we recommend increasing the deferred vested retirement age assumption for General members with reciprocity from age 60 to age 61 and maintaining the assumption for General members without reciprocity at age 60.

Safety Members' Deferred Vested Retirement Age

Line Description	Reciprocal Members	Non-Reciprocal Members
Current assumption	53.0	51.0
Actual average age (3 Years)	52.3	50.3
Actual average age (6 Years)	52.3	51.3
Proposed assumption	53.0	50.0

Based on this experience, we recommend maintaining the deferred vested retirement age assumption for Safety members with reciprocity at age 53 and decreasing the assumption for Safety members without reciprocity from age 51 to age 50.

Chart 23: Actual Number of Retirements Compared to Expected General Tier 1 Enhanced Members



Chart 24: Actual Number of Retirements Compared to Expected General Tier 3 Enhanced Members



Contra Costa County Employees' Retirement Association – Actuarial Experience Study as of December 31, 2023



Chart 25: Actual Number of Retirements Compared to Expected General Tier 4 and Tier 5 Members



Chart 26: Actual Number of Retirements Compared to Expected Safety Tier A Enhanced Members



Contra Costa County Employees' Retirement Association – Actuarial Experience Study as of December 31, 2023



Chart 27: Actual Number of Retirements Compared to Expected Safety Tier C Enhanced Members



Chart 28: Actual Number of Retirements Compared to Expected Safety Tier A Non-Enhanced, Tier D and Tier E Members



Contra Costa County Employees' Retirement Association – Actuarial Experience Study as of December 31, 2023





Chart 30: Retirement Rates General Tier 1 Enhanced Members with 30 or more Years of Service









Chart 31: Retirement Rates General Tier 3 Enhanced Members with less than 30 Years of Service

Chart 32: Retirement Rates General Tier 3 Enhanced Members with 30 or more Years of Service







Chart 33: Retirement Rates General Tier 4 and Tier 5 Members with less than 30 Years of Service

Chart 34: Retirement Rates General Tier 4 and Tier 5 Members with 30 or more Years of Service







Chart 36: Retirement Rates Safety Tier A Enhanced Members with 30 or more Years of Service















F. Leave cashouts

In 1998, the Board of Retirement, in the course of actions related to the Paulson Settlement, determined that several additional pay elements should be included as Earnable Compensation. For purposes of the actuarial valuation, these additional pay elements fall into two categories:

- **Ongoing Pay Elements:** Those that are expected to be received relatively uniformly over a member's employment years.
- Leave Cashout Elements: Those that are expected to be received mostly during the member's final average earnings pay period.

The first category is recognized in the actuarial calculations by virtue of being included in the current pay of active members. The second category requires a separate actuarial assumption to anticipate its impact on a member's retirement benefit. Note that members in the PEPRA tiers do not have a leave cashout assumption, because leave cashout elements are not included in pensionable compensation under the PEPRA formulas.

AB 197 required CCCERA to implement a policy where certain terminal pay elements are no longer included in the determination of compensation for retirement purposes. This applies to all legacy tiers. In addition, the Board decided to discontinue "straddling" where employees could time their leave cashouts so that two leave cashouts would occur during their 12-month final average earnings period. The Board decided that only one such payment should be included on a prospective basis.

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 (ACERA) and Board of Retirement of ACERA. In particular, the decision requires pension systems like CCCERA to exclude certain pay items from a legacy member's compensation earnable. Our understanding is that the Alameda decision in 2020 does not affect the CCCERA leave cashout policy.

The cost of this pay element is recognized in the valuation as an employer and member cost in both the basic and COLA components.

The following tables show the estimated leave cashouts for non-PEPRA members as a percentage of current pay based on actual experience over the past three years. The leave cashouts shown are only those that occur during the member's final average earnings period.

The results are summarized by cost group followed by a key showing the employers in each cost group. Also shown are the current rate assumed and the rates we propose.

It is not always clear from the member data how much **additional** leave is cashed out in the years right before retirement (i.e., Leave Cashout Elements) as compared to what is cashed out in earlier years of service (i.e., Ongoing Pay Elements). Our recommended leave cashout assumptions are set based on what is reported during the final average earnings period, which implicitly assumes no leave cashouts prior to that period were included in the Ongoing Pay Elements.



Average Leave Cashout as a % of Final Average Pay by General Cost Groups

Year	Cost Group #1	Cost Group #2 Tier 2	Cost Group #2 Tier 3	Cost Group #3	Cost Group #4	Cost Group #5	Cost Group #6 ¹
2021	1.62%	0.62%	0.80%	5.52%	2.43%	0.00%	0.00%
2022	2.21%	0.98%	0.95%	5.85%	2.15%	0.00%	0.00%
2023	1.64%	0.71%	1.00%	5.77%	2.83%	1.90%	0.00%
Current Study Average ²	1.85%	0.79%	0.91%	5.70%	2.53%	0.53%	0.00%
Prior Study Average ²	0.95%	0.59%	0.75%	6.58%	2.88%	0.51%	0.00%
Retiring Member Count	98	598	926	35	17	12	1
Current Assumption	1.00%	0.50%	0.75%	5.25%	1.00%	1.00%	0.00%
Proposed Assumption	1.25%	0.60%	0.75%	5.50%	1.75%	0.75%	0.00%

Average Leave Cashout as a % of Final Average Pay by Safety Cost Groups

Year	Cost Group #7	Cost Group #8	Cost Group #9	Cost Group #10	Cost Group #11	Cost Group #12 ³
2021	0.39%	0.00%	0.00%	0.00%	3.70%	1.41%
2022	0.40%	0.00%	0.00%	0.00%	2.98%	3.56%
2023	0.10%	0.00%	0.00%	0.00%	3.36%	0.00%
Current Study Average ²	0.30%	0.00%	0.00%	0.00%	3.30%	2.26%
Prior Study Average ²	0.41%	0.12%	0.00%	0.00%	3.73%	1.31%
Retiring Member Count	173	24	11	8	34	4
Current Assumption	0.50%	0.25%	0.00%	0.25%	3.00%	1.75%
Proposed Assumption	0.50%	0.20%	0.00%	0.00%	3.00%	1.75%

Based on this experience, we recommend decreasing the leave cashout assumption for some Cost Groups while increasing the leave cashout assumption for other Cost Groups.

¹ CCCERA has previously confirmed that legacy members in this Cost Group are not eligible to apply cashouts in their Final Average Pay.

² The average rates shown are weighted-averages based on the final average pay before leave cashouts for each year within the three-year period.

³ The annexation of Rodeo-Hercules Fire Protection District (RHFPD, Cost Group #12) to Contra Costa County Fire Protection District (CCCFPD, Cost Group #8) is pending final approval by LAFCO and is expected to be effective around July 1, 2025. It is our understanding that the employees of RHFPD will be governed by the CCCFPD employment rules after July 1, 2025. The leave cashout information for Cost Groups #8 and #12 as shown in the table above was developed based on the actual experience during the experience study period and reflects the current respective cashout policies for each Cost Group. After the annexation becomes effective and members from Cost Group #12 are transferred to Cost Group #8, we will apply the Cost Group #8 leave cashout assumption to all members under Cost Group #8.



General Cost Groups and Employers

Cost Group	Employer Name	Benefit Structure
1	County General	Tier 1 Enhanced/PEPRA Tier 4
	Local Agency Formation Commission	Tier 1 Enhanced/PEPRA Tier 4
	Contra Costa Mosquito and Vector Control District	Tier 1 Enhanced/PEPRA Tier 4
	Bethel Island Municipal District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
	First 5-Children & Families Commission	Tier 1 Enhanced/PEPRA Tier 4
	Contra Costa County Employees' Retirement Association	Tier 1 Enhanced/PEPRA Tier 4
	Superior Court	Tier 1 Enhanced/PEPRA Tier 4
	Moraga-Orinda Fire District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
	Rodeo-Hercules Fire Protection District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
	San Ramon Valley Fire District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
2	County General	Tier 3 Enhanced/PEPRA Tier 5
	In-Home Supportive Services Authority	Tier 3 Enhanced/PEPRA Tier 5
	Contra Costa Mosquito and Vector Control District	Tier 3 Enhanced/PEPRA Tier 5
	Superior Court	Tier 3 Enhanced/PEPRA Tier 5
3	Central Contra Costa Sanitary District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
4	Contra Costa Housing Authority	Tier 1 Enhanced/PEPRA Tier 4
5	Contra Costa County Fire Protection District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
6	Rodeo Sanitary District	Tier 1 Non-Enhanced/PEPRA Tier 4
	Byron Brentwood Cemetery	Tier 1 Non-Enhanced/PEPRA Tier 4

Safety Cost Groups and Employers

Cost		
Group	Employer Name	Benefit Structure
7	County Safety	Tier A Enhanced/PEPRA Tier D
8	Contra Costa County Fire Protection District	Tier A Enhanced/PEPRA Tier D/E
9	County Safety ¹	Tier C Enhanced/PEPRA Tier E
10	Moraga-Orinda Fire District	Tier A Enhanced/PEPRA Tier D
11	San Ramon Valley Fire District	Tier A Enhanced/PEPRA Tier D
12	Rodeo-Hercules Fire Protection District	Tier A Non-Enhanced/PEPRA Tier D

¹ Members hired on or after January 1, 2007.



G. Service from unused sick leave

At retirement, members can convert their unused sick leave to increase the service credit used in the calculation of their retirement benefit. The actuarial valuation anticipates this additional benefit using an assumption to estimate the proportional increase in service that will occur due to unused sick leave conversions.

Pursuant to Section 31641.01, the cost of this benefit for the non-PEPRA tiers will be charged only to employers and will not affect member contribution rates.

The following table shows the estimated sick leave converted to service credit as a percentage of total service credit (before including the sick leave converted to service credit) at retirement separately for General and Safety members as well as non-disabled and disabled members, based on the actual experience over the past three years. Also shown are the current assumed rates and the rates we propose.

Sick Leave Converted to Service Credit as Percentage of Total Service (Before Including the Sick Leave to be Converted)

Year	Service Retiree General	Service Retiree Safety	Disabled Retiree General	Disabled Retiree Safety
2021	1.04%	1.91%	0.00%	0.90%
2022	1.08%	1.69%	1.14%	0.57%
2023	0.98%	1.37%	0.00%	0.24%
Current Study Average ¹	1.04%	1.66%	0.14%	0.61%
Prior Study Average ¹	0.82%	1.41%	0.11%	0.37%
Current Assumption	1.00%	1.70%	0.06%	1.00%
Proposed Assumption	1.00%	1.70%	0.08%	0.90%

Based on this experience, we recommend maintaining the sick leave conversion assumption for all service retirees while increasing the sick leave conversion assumption for General disabled retirees and decreasing the assumption for Safety disabled retirees.

¹ The average rates shown are weighted-averages based on the total service for each year within the three-year period.



H. Miscellaneous assumptions

Reciprocity

Under the current assumptions, a percentage of future inactive members are assumed to work under a reciprocal retirement system. The following table shows the observed reciprocity percent based on the actual experience of all inactive members as of December 31, 2023. Unlike other assumptions, we do not review just new deferred vested members during the threeyear period because there is typically a lag between a member's date of termination and the time that it is known if they have reciprocity with a reciprocal retirement system. Also shown are the current and proposed assumptions.

Line Description	General	Safety
Current assumption	40%	70%
Actual percent	16%	46%
Proposed assumption	20%	50%

Percent of Inactive Members Covered under Reciprocal System

We recommend decreasing the reciprocal assumption to 20% for General members and decreasing the assumption to 50% for Safety members. For this study, we have modified the approach of evaluating the reciprocity assumptions to align with how this assumption is applied in the valuation. In particular, we have included both the deferred vested members and the deferred non-vested members when developing the reciprocity percentage. This is the main reason why the proposed assumptions decreased significantly from the current assumptions.

In addition, we recommend 3.55% and 4.10% annual salary increase assumptions for General and Safety members, respectively, be utilized to anticipate salary increases from the date of termination from CCCERA to the expected date of retirement for deferred vested members covered by a reciprocal retirement system. These assumptions are based on the ultimate 0.55% and 1.10% merit and promotion salary increase assumptions for General and Safety members, respectively, together with the 2.50% inflation and 0.50% "across-the-board" salary increase assumptions that are recommended in *Section 3* of this report.

Percent with eligible survivor

The value of a member's retirement, disability, or death benefit depends on the percentage of members who are assumed to have an eligible spouse or domestic partner.

The following table shows the observed percentage of new retirees, weighted by benefit amounts, who were reported with an eligible spouse or domestic partner at the time of retirement based on the actual experience over the past three years. Also shown are the current and proposed assumptions. This information is shown separately by the member's gender.



New Retirees with Eligible Spouse or Domestic Partner who Selected the Unmodified Option (Weighted by Benefit Amount)

Line Description	Male Member	Female Member
Current assumption	65%	50%
Actual percent	70%	53%
Proposed assumption	70%	55%

Based on this experience, we recommend increasing the percent with eligible survivor assumption for male members to 70% and increasing the assumption for female members to 55%.

Eligible survivor age and gender

Since the present value of the survivor's automatic continuance benefit is dependent on the survivor's age and gender, we must also have assumptions for these demographics of the survivor. Based on the actual experience for members who retired during the past three years (results shown in the table below) and studies done for other retirement systems, **we recommend the following:**

- 1. We recommend maintaining the survivor gender assumption that male members have a female survivor, and female members have a male survivor. We note that this assumption is consistent with the actual data for most members as of December 31, 2023, even with the inclusion of domestic partners.
- 2. We recommend maintaining the spouse age difference assumption that male retirees are three years older than their spouses and female retirees are two years younger than their spouses. These assumptions will continue to be monitored in future experience studies.

Line Description	Male Retiree	Female Retiree
Current assumption	3 years older	2 years younger
Actual experience	3.0 years older	2.7 years younger ¹
Proposed assumption	3 years older	2 years younger

Member's Age as Compared to Survivor's Age

Active death optional form election

Active members could elect an Optional Settlement 2 (or Optional Settlement 4 for more than one beneficiary) allowance in advance to provide a continuance of 100% (with actuarial adjustment) to the member's spouse, domestic partner or other beneficiaries upon the member's active death.

¹ Actual nine-year experience is 2.4 years younger. We have taken this longer term experience into consideration when setting our proposed assumption.



Currently, we assume that only members who are married or have a domestic partner would make this advance election to provide a continuance of 100% to their spouse/domestic partner upon the member's active death. (This means that a continuance of 100% is not assumed in the valuation for members who are not expected to be married or have domestic partnership.)

For this experience study, we requested and CCCERA provided us a file with the relationship information for members who have made the advance optional form election for active death.¹ Out of about 5,312 active members who had made such election,² 2,413 members (somewhat less than 50%) had named a spouse/domestic partner as the beneficiaries. Based on the recommended assumption that 70% of all male members and 55% of all female members would be expected to be married at retirement or active death, we recommend that we continue to apply the same assumption to anticipate the proportion of active members who would be married and expected to elect an Optional Settlement 2 to cover their spouse/domestic partner at pre-retirement death.

For the remaining 2,899 active members who had made the advance Optional Settlement 2 election and named a beneficiary who is not the member's spouse/domestic partner, the following table shows the observed percentages of the various type of beneficiaries that are covered under the advance optional form election. Also shown are the percentages we proposed and the assumption for age differences.

Beneficiary Type ³	Observed Percentage	Proposed Percentage Assumption	Proposed Age Difference with Active Member
Child	30%	30%	30 years younger
Parent	32%	30%	30 years older
Sibling and other	38%	40%	Same age

Optional Settlement 2 Election for Active Death

For active members who are assumed to be non-married at pre-retirement death, we recommend applying an assumption that those members would have made an advance Optional Settlement 2 election and cover a beneficiary as shown in the table above.

Future benefit accruals

Benefits are based on the years of service and compensation earned by the member. In order to project benefits and determine the liabilities, an assumption about the amount of service earned by members each year is necessary.

We recommend maintaining the current assumption that full-time employees accrue 1.0 year of service annually, while part-time employees earn service proportionate to their part-time percentage each year.



¹ Similar information for members who actually died is not readily available.

² The file provided by CCCERA also includes about 5,676 active members who did not make the advance optional form election. For purposes of valuing the pre-retirement death benefit, we will assume that all active members would have made the advance optional form election and the beneficiaries covered would be similar to that described in this section.

³ We made the simplifying assumption that the beneficiary is of the opposite sex of the member.

Unknown data for members

When various elements of valuation data are not available, an assumption must be made in order to project benefits and determine liabilities.

The following table shows the gender of active members based on actual experience as of December 31, 2023. Also shown are the current and proposed assumptions for members with unknown gender.¹ This information is shown separately for active General and Safety members.

General Member – Assumption for Unknown Gender

Line Description	Male Member	Female Member
Current assumption	100%	0%
Actual percent as of December 31, 2023	29%	71%
Proposed assumption	0%	100%

Safety Member — Assumption for Unknown Gender

Line Description	Male Member	Female Member
Current assumption	100%	0%
Actual percent as of December 31, 2023	85%	15%
Proposed assumption	100%	0%

Based on this experience, we recommend updating the assumption for members with unknown gender to assume General members are female and Safety members are male. We would continue to monitor this experience and if more members fall into this category, we may recommend a change in method in the next experience study.

Form of payment

Under the plan provisions, an eligible survivor of a deceased member who has elected the unmodified option is eligible to receive a benefit continuance upon the member's death.

In prior valuations, it was assumed that all active and inactive members would select the unmodified option at retirement. Actual experience for recent new retirees shows that 93% select the unmodified option. Therefore, we recommend maintaining the assumption that all members will elect the unmodified option at retirement.

¹ Note that as of December 31, 2023, there were only 8 records who were reported with an unknown gender.



Section 5: Cost Impact

We have estimated the impact of all the recommended demographic and economic assumptions as if they were applied to the December 31, 2023 actuarial valuation. The table below shows the changes in the employer and member contribution rates due to the proposed assumption changes separately for the economic assumption changes (as recommended in *Section 3* of this report, which include the recommended merit and promotion salary increases) and the demographic assumption changes (as recommended in *Section 4* of this report).

Assumption	Impact on Average Employer Contribution Rates	Impact on Average Member Contribution Rates
Changes in demographic assumptions	-0.86%	-0.10%
Changes in economic assumptions	0.32%	0.13%
Total change in average rate	-0.54%	0.03%
Estimated increase in annual amount (\$ in '000s) ¹	-\$6,362	\$269

Cost Impact of the Recommended Assumptions Based on December 31, 2023 Actuarial Valuation

Assumption	Impact on UAAL (\$million)	Impact on Funded Ratio (VVA ² Basis)
Changes in demographic assumptions	-\$81.8	0.60%
Changes in economic assumptions	40.5	-0.30%
Total change	-\$41.3	0.30%

Note: Results may not add due to rounding.

The tables below show the average employer and member contribution rate impacts for each cost group due to the recommended assumption changes as if they were applied to the December 31, 2023 actuarial valuation.

¹ Based on December 31, 2023 projected compensation as determined under the proposed assumptions.

² Valuation value of assets.



Section 5: Cost Impact

Employer Contribution Rate Increases/(Decreases) (% of Payroll)

Cost Group	Normal Cost	UAAL	Total	Annual Amount ¹ (\$ in '000s)
General				
Cost Group #1 – County and Small Districts (Tiers 1 and 4)	-0.36%	-0.31%	-0.67%	-\$155
Cost Group #2 – County and Small Districts (Tiers 3 and 5)	-0.41%	-0.31%	-0.72%	-6,041
Cost Group #3 – Central Contra Costa Sanitary District	-0.37%	-0.24%	-0.61%	-256
Cost Group #4 – Contra Costa Housing Authority	-0.39%	-0.45%	-0.84%	-57
Cost Group #5 – Contra Costa County Fire Protection District	-0.16%	-0.37%	-0.53%	-49
Cost Group #6 – Small Districts (Non-Enhanced Tiers 1 and 4)	-0.26%	-0.02%	-0.28%	-4
Safety				
Cost Group #7 – County (Tiers A and D)	-0.06%	0.15%	0.09%	\$42
Cost Group #8 – Contra Costa Fire Protection District	0.18%	-0.27%	-0.09%	-64
Cost Group #9 – County (Tiers C and E)	0.06%	0.15%	0.21%	157
Cost Group #10 – Moraga-Orinda Fire District	0.04%	-0.35%	-0.31%	-28
Cost Group #11 – San Ramon Valley Fire District	0.20%	0.03%	0.23%	59
Cost Group #12 – Rodeo-Hercules Fire Protection District	0.36%	0.85%	1.21%	36
Total Plan	-0.30%	-0.24%	-0.54%	-\$6,362

Average Member Contribution Rate Increases/(Decreases) (% of Payroll)

Cost Group	Rate	Annual Amount ¹ (\$ in '000s)
General		
Cost Group #1 – County and Small Districts (Tiers 1 and 4)	0.00%	\$0
Cost Group #2 – County and Small Districts (Tiers 3 and 5)	-0.06%	-503
Cost Group #3 – Central Contra Costa Sanitary District	0.05%	21
Cost Group #4 – Contra Costa Housing Authority	-0.03%	-2
Cost Group #5 – Contra Costa County Fire Protection District	0.02%	2
Cost Group #6 – Small Districts (Non-Enhanced Tiers 1 and 4)	0.02%	0
Safety		
Cost Group #7 – County (Tiers A and D)	0.44%	\$204
Cost Group #8 – Contra Costa Fire Protection District	0.39%	275
Cost Group #9 – County (Tiers C and E)	0.17%	127
Cost Group #10 – Moraga-Orinda Fire District	0.42%	38
Cost Group #11 – San Ramon Valley Fire District	0.38%	97
Cost Group #12 – Rodeo-Hercules Fire Protection District	0.35%	10
Total Plan	0.03%	\$269

Note: Results may not add due to rounding.

¹ Based on December 31, 2023 projected compensation as determined under the proposed assumptions.



Section 5: Cost Impact

There is a decrease in the average employer rate of 0.54% (which includes a decrease in normal cost rate of about 0.30% and a decrease in the UAAL rate of about 0.24%). This decrease is mainly due to demographic assumption changes that reduce cost (such as higher termination rate, lower disability rate and new mortality tables that predict lower life expectancies for payees at advance ages) that is offset somewhat by the increase in the merit and promotion salary increases assumption.

There is an increase in the average member rate mainly due to the increase in the merit and promotion salary increases assumption. We note that the basic contribution rates for legacy members are not impacted by most of the demographic assumptions such as retirement rate, termination rate and disability rate. Therefore, the changes in those assumptions do not have an impact on the basic contribution rates for legacy members. Moreover, the reduction in the employer UAAL rate is also not shared by the members.



Appendix A: Current Actuarial Assumptions

Economic assumptions

Net investment return

6.75%, net of investment expenses.

Administrative expenses

Actual administrative expenses as a percentage of payroll are allocated between the employer and member based on normal cost (before expenses) for the employer and member. This assumption is subject to change each year based on the actual administrative expenses as a percent of actual covered payroll during the calendar year ending on the valuation date.

The administrative expense load was 1.17% of payroll based on the December 31, 2023 actuarial valuation.

Inflation rate

Increase of 2.50% per year.

Cost-of-Living Adjustment (COLA)

Increases of 2.75% per year.

- The actual COLA granted by CCCERA on April 1, 2024 has been reflected for non-active members in the December 31, 2023 valuation.
- For members that have COLA banks, the COLA banks are reflected in projected future COLAs.
- Benefits are subject to a maximum COLA per year, which varies based on the member's tier and retirement type, as shown in the table below.

General Membership Tier	Safety Membership Tier	Maximum COLA Per Year	COLA Valued (Before Application of COLA Banks)
Tier 1, Tier 3 (non-disability), Tier 4, and Tier 5 (non-disability)	Tier A and Tier D	3.00%	2.75%
Tier 2, Tier 3 (disability), and Tier 5 (disability)	N/A	4.00%	2.75%
Tier 4 and Tier 5 members covered under certain MOUs	Tier C and Tier E	2.00%	2.00%



Appendix A: Current Actuarial Assumptions

Member contribution crediting rate

6.75%, compounded semi-annually.

Payroll growth

Inflation of 2.50% per year plus "across-the-board" salary increase of 0.50% per year.

Increase in Internal Revenue Code Section 401(a)(17) compensation limit

Increase of 2.50% per year from the valuation date.

Increase in Section 7522.10 compensation limit

Increase of 2.50% per year from the valuation date.



Appendix A: Current Actuarial Assumptions

Salary increases

The annual rate of compensation increase includes:

- Inflation at 2.50%, plus
- "Across-the-board" salary increase of 0.50% per year, plus
- Merit and promotion increase based on years of service:

Years of Service	General	Safety
Less than 1	11.00	12.00
1 – 2	6.50	8.50
2 – 3	4.75	5.50
3 – 4	3.50	5.00
4 – 5	2.50	4.00
5 – 6	2.00	3.00
6 – 7	1.75	2.25
7 – 8	1.65	1.75
8 – 9	1.45	1.50
9 – 10	1.35	1.45
10 – 11	1.30	1.40
11 – 12	1.10	1.35
12 – 13	1.00	1.30
13 – 14	0.90	1.25
14 – 15	0.80	1.25
15 – 16	0.75	1.25
16 – 17	0.70	1.25
17 – 18	0.65	1.25
18 – 19	0.60	1.25
19 – 20	0.55	1.25
20 and over	0.50	1.00

Merit and Promotion Increases (%)

Demographic assumptions

Post-retirement mortality rates

Healthy

- General members
 - Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Safety members

 Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Disabled

- General members
 - Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) increased by 5% for males and unadjusted for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Safety members

 Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) increased by 5% for males and unadjusted for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Beneficiary

- Beneficiaries not currently in pay status
 - Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.
- Beneficiaries in pay status
 - Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.


Pre-retirement mortality rates

General members

 Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Safety members

 Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Age	General Male	General Female	Safety Male	Safety Female
20	0.04	0.01	0.04	0.02
25	0.02	0.01	0.03	0.02
30	0.03	0.01	0.04	0.02
35	0.04	0.02	0.04	0.03
40	0.06	0.03	0.05	0.04
45	0.09	0.05	0.07	0.06
50	0.13	0.08	0.10	0.08
55	0.19	0.11	0.15	0.11
60	0.28	0.17	0.23	0.14
65	0.41	0.27	0.35	0.20
70	0.61	0.44	0.66	0.39

Pre-Retirement Mortality Rates (%) — Before Generational Projection from 2010

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

Mortality rates for member contributions

The following mortality rates are used in calculating the member basic contribution rates for General Tier 1 and Tier 3, as well as Safety Tier A and Tier C.

- General Members
 - Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected 30 years with the two-dimensional mortality improvement scale MP-2021, weighted 30% male and 70% female.

Safety Members

 Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) increased by 5% for males and decreased by 5% for females, projected 30 years with the two-dimensional mortality improvement scale MP-2021, weighted 85% male and 15% female.



Disability

Age	General Tier 1 and Tier 4	General Tier 3 and Tier 5	Safety
20	0.01	0.01	0.06
25	0.02	0.02	0.16
30	0.04	0.03	0.32
35	0.08	0.05	0.46
40	0.22	0.07	0.56
45	0.36	0.09	0.96
50	0.52	0.12	2.88
55	0.60	0.16	4.00
60	0.60	0.18	4.30
65	0.60	0.18	4.50
70	0.60	0.18	4.50

Disability Incidence Rates (%)

Assumed Percentage of Future Disability Type

Membership Tier	Service-Connected Disabilities	Non-Service-Connected Disabilities
General Tier 1 and Tier 4	65%	35%
General Tier 3 and Tier 5	25%	75%
Safety	100%	0%



Termination

Years of Service	General	Safety
Less than 1	14.00	11.00
1 – 2	9.50	9.00
2 – 3	9.00	7.00
3 – 4	6.25	5.00
4 – 5	6.25	4.00
5 – 6	5.00	3.50
6 – 7	4.50	3.00
7 – 8	4.00	2.50
8 - 9	3.75	2.50
9 - 10	3.75	2.00
10 – 11	3.50	2.00
11 – 12	3.25	2.00
12 – 13	2.75	2.00
13 – 14	2.50	1.80
14 – 15	2.50	1.60
15 – 16	2.25	1.50
16 – 17	2.25	1.40
17 – 18	2.00	1.30
18 – 19	2.00	1.20
19 – 20	1.50	1.00
20 and over	1.50	0.50

Termination Rates (%)

The member is assumed to receive the greater of a refund of member contributions or the present value of a deferred retirement benefit.

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



Retirement rates

Retirement Rates (%) – General

Age	Tier 1 Enhanced: <30 Years of Service	Tier 1 Enhanced: 30+ Years of Service	Tier 3 Enhanced: <30 Years of Service	Tier 3 Enhanced: 30+ Years of Service	Tier 1 Non-Enhanced	Tier 4 and Tier 5
49	0.00	0.00	0.00	25.00	0.00	0.00
50	4.00	10.00	4.00	10.00	3.00	0.00
51	4.00	10.00	3.00	5.00	3.00	0.00
52	4.00	10.00	3.00	5.00	3.00	2.00
53	4.00	10.00	4.00	5.00	3.00	3.00
54	10.00	16.00	6.00	11.00	3.00	3.00
55	15.00	24.00	8.00	15.00	10.00	4.00
56	15.00	24.00	8.00	10.00	10.00	5.00
57	15.00	24.00	8.00	10.00	10.00	6.00
58	15.00	22.00	9.00	15.00	10.00	6.00
59	18.00	22.00	10.00	15.00	10.00	8.00
60	20.00	20.00	12.00	15.00	25.00	8.00
61	20.00	20.00	16.00	20.00	15.00	12.00
62	25.00	30.00	20.00	25.00	40.00	15.00
63	25.00	30.00	20.00	25.00	35.00	17.00
64	25.00	30.00	25.00	28.00	30.00	20.00
65	35.00	35.00	30.00	32.00	40.00	25.00
66	40.00	40.00	32.00	32.00	35.00	25.00
67	40.00	40.00	30.00	30.00	35.00	25.00
68	40.00	40.00	30.00	30.00	35.00	25.00
69	40.00	40.00	30.00	30.00	35.00	25.00
70	40.00	40.00	35.00	35.00	40.00	35.00
71	35.00	35.00	35.00	35.00	40.00	35.00
72	35.00	35.00	35.00	35.00	40.00	35.00
73	35.00	35.00	35.00	35.00	50.00	35.00
74	35.00	35.00	35.00	35.00	50.00	35.00
75+	100.00	100.00	100.00	100.00	100.00	100.00

	Age	Tier A Enhanced: <30 Years of Service	Tier A Enhanced: 30+ Years of Service	Tier C Enhanced	Tier A Non-Enhanced and Tier D and Tier E
	45	7.00	7.00	2.00	0.00
	46	5.00	5.00	1.00	0.00
	47	7.00	7.00	4.00	0.00
	48	10.00	30.00	4.00	0.00
	49	22.00	30.00	12.00	0.00
	50	22.00	30.00	20.00	5.00
	51	22.00	22.00	18.00	4.00
	52	16.00	20.00	15.00	4.00
	53	16.00	22.00	15.00	5.00
	54	16.00	24.00	18.00	6.00
	55	16.00	30.00	18.00	15.00
	56	18.00	30.00	15.00	15.00
	57	18.00	30.00	15.00	15.00
	58	20.00	35.00	25.00	15.00
	59	20.00	35.00	25.00	20.00
	60	20.00	35.00	25.00	20.00
	61	20.00	35.00	25.00	20.00
	62	20.00	35.00	25.00	20.00
	63	25.00	35.00	30.00	20.00
	64	35.00	35.00	35.00	25.00
(65+	100.00	100.00	100.00	100.00

Retirement Rates (%) — Safety



Inactive members

Current and Future Inactive Member Assumptions

Category	% of Future ¹ Inactive Members	Annual Salary Increases from Separation Date	Retirement Age
General with reciprocity	40%	3.50%	60
General without reciprocity	60%	N/A	60
Safety with reciprocity	70%	4.00%	53
Safety without reciprocity	30%	N/A	51

Inactive member benefit

- Inactive members without reciprocity who terminate with less than five years of service and are not vested are assumed to receive an immediate refund of their member contributions.
- All other inactive members are assumed to receive the greater of an immediate refund of their member contributions or the present value of a deferred retirement benefit.

Future benefit accruals

1.0 year of service per year for full-time employees. Continuation of current partial service accrual for part-time employees.

Unknown data for members

- Same as those exhibited by members with similar known characteristics.
- If not specified, members are assumed to be male.

Definition of active members

All active members of CCCERA as of the valuation date.

Form of payment

- All active and inactive members are assumed to elect the unmodified option at retirement.
- There is no explicit assumption for children's benefits.

¹ CCCERA provides the reciprocity status for current inactive members in the valuation census data.



Survivor assumptions

Current Active and Inactive Member Eligible Survivor Assumptions

% with Eligible Survivor at Retirement or Member Gender Pre-Retirement Death		Eligible Survivor Age	Eligible Survivor Gender
Male member	65%	3 years younger than member	Female
Female member	50%	2 years older than member	Male

Offsets by other plans of the employer for disability benefits

The Plan requires members who retire because of disability from General Tier 3 and General Tier 5 to offset the Plan's disability benefits with other Plans of the employer. We have not assumed any offsets in this valuation.

Leave cashout

General Tier 1, Tier 2 and Tier 3 & Safety Tier A and Tier C

Cost Group	Leave Cashout
Cost Group 1	1.00%
Cost Group 2	0.50% for Tier 2 0.75% for Tier 3
Cost Group 3	5.25%
Cost Group 4	1.00%
Cost Group 5	1.00%
Cost Group 6	0.00%
Cost Group 7	0.50%
Cost Group 8	0.25%
Cost Group 9	0.00%
Cost Group 10	0.25%
Cost Group 11	3.00%
Cost Group 12	1.75%
Withdrawn Employers	0.00%

Leave Cashout as Percentage of Final Average Pay

General Tier 4 and Tier 5 & Safety Tier D and Tier E None.



Service from accumulated sick leave

Additional Service Converted from Accumulated Sick Leave

Retirement Type and Membership Group	Converted Sick Leave as % of Service at Retirement
Service Retirements	
General	1.00%
Safety	1.70%
Disability Retirements	
General	0.06%
Safety	1.00%

Pursuant to Section 31641.01, the cost of this benefit for the non-PEPRA tiers will be charged only to employers and will not affect member contribution rates.



Economic assumptions

Net investment return

6.75%, net of investment expenses.

Administrative expenses

Actual administrative expenses as a percentage of payroll are allocated between the employer and member based on normal cost (before expenses) for the employer and member. This assumption is subject to change each year based on the actual administrative expenses as a percent of actual covered payroll during the calendar year ending on the valuation date.

The administrative expense load was 1.17% of payroll based on the December 31, 2023 actuarial valuation.

Inflation rate

Increase of 2.50% per year.

Cost-of-Living Adjustment (COLA)

Increases of 2.75% per year.

- The actual COLA granted by CCCERA on April 1, 2024 has been reflected for non-active members in the December 31, 2023 valuation.
- For members that have COLA banks, the COLA banks are reflected in projected future COLAs.
- Benefits are subject to a maximum COLA per year, which varies based on the member's tier and retirement type, as shown in the table below.

General Membership Tier	Safety Membership Tier	Maximum COLA Per Year	COLA Valued (Before Application of COLA Banks)
Tier 1, Tier 3 (non-disability), Tier 4, and Tier 5 (non-disability)	Tier A and Tier D	3.00%	2.75%
Tier 2, Tier 3 (disability), and Tier 5 (disability)	N/A	4.00%	2.75%
Tier 4 and Tier 5 members covered under certain MOUs	Tier C and Tier E	2.00%	2.00%



Member contribution crediting rate

6.75%, compounded semi-annually.

Payroll growth

Inflation of 2.50% per year plus "across-the-board" salary increase of 0.50% per year.

Increase in Internal Revenue Code Section 401(a)(17) compensation limit

Increase of 2.50% per year from the valuation date.

Increase in Section 7522.10 compensation limit

Increase of 2.50% per year from the valuation date.

Salary increases

The annual rate of compensation increase includes:

- Inflation at 2.50%, plus
- "Across-the-board" salary increase of 0.50% per year, plus
- Merit and promotion increase based on years of service:

	General	General	Safety	Safety
Years of Service	Legacy	PEPRA	Legacy	PEPRA
Less than 1	11.00%	9.00%	12.00%	10.00%
1 – 2	6.50%	6.00%	8.50%	8.50%
2 – 3	4.75%	4.50%	5.50%	5.50%
3 – 4	3.50%	3.25%	5.00%	5.00%
4 – 5	2.50%	2.50%	4.00%	4.25%
5 – 6	2.00%	2.00%	3.00%	3.25%
6 – 7	1.75%	1.70%	2.25%	2.25%
7 – 8	1.65%	1.60%	1.75%	1.75%
8 – 9	1.65%	1.65%	1.75%	1.75%
9 – 10	1.70%	1.70%	1.75%	1.75%
10 – 11	1.70%	1.70%	1.60%	1.60%
11 – 12	1.25%	1.25%	1.60%	1.60%
12 – 13	1.10%	1.10%	1.60%	1.60%
13 – 14	1.20%	1.20%	1.70%	1.70%
14 — 15	1.30%	1.30%	1.80%	1.80%
15 – 16	1.30%	1.30%	1.80%	1.80%
16 – 17	1.00%	1.00%	1.50%	1.50%
17 – 18	0.90%	0.90%	1.50%	1.50%
18 – 19	0.80%	0.80%	1.50%	1.50%
19 – 20	0.75%	0.75%	1.75%	1.75%
20 – 21	0.75%	0.75%	1.75%	1.75%
21 – 22	0.60%	0.60%	1.40%	1.40%
22 – 23	0.60%	0.60%	1.30%	1.30%
23 – 24	0.60%	0.60%	1.25%	1.25%
23 – 25	0.60%	0.60%	1.15%	1.15%
20 and over	0.55%	0.55%	1.10%	1.10%

Merit and Promotion Increases (%)



Demographic assumptions

Post-retirement mortality rates

Healthy

- General members
 - Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.

Safety members

 Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.

Disabled

General members

 Pub-2016 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP 2021.

Safety members

 Pub-2016 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.

Beneficiary

- Beneficiaries not currently in pay status
 - Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.
- Beneficiaries in pay status
 - Pub-2016 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.



Pre-retirement mortality rates

General members

- Pub-2016 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates decreased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- Safety members
 - Pub-2016 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Age	General Male	General Female	Safety Male	Safety Female
20	0.02%	0.01%	0.02%	0.01%
25	0.03%	0.01%	0.03%	0.01%
30	0.03%	0.01%	0.04%	0.02%
35	0.04%	0.02%	0.04%	0.03%
40	0.05%	0.04%	0.05%	0.04%
45	0.08%	0.05%	0.07%	0.06%
50	0.12%	0.08%	0.10%	0.09%
55	0.18%	0.12%	0.16%	0.13%
60	0.28%	0.18%	0.27%	0.20%
65	0.42%	0.28%	0.45%	0.32%
70	0.65%	0.43%	0.84%	0.50%

Pre-Retirement Mortality Rates (%) — Before Generational Projection from 2016

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

Mortality rates for member contributions

The following mortality rates are used in calculating the member basic contribution rates for General Tier 1, Tier 2 and Tier 3, as well as Safety Tier A and Tier C.

- General Members
 - Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected 30 years (from 2016) with the two-dimensional mortality improvement scale MP-2021, weighted 30% male and 70% female.

• Safety Members

 Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected 30 years (from 2016) with the two-dimensional mortality improvement scale MP-2021, weighted 85% male and 15% female.



Appendix B: Proposed Actuarial Assumptions **Disability**

Age	General Tier 1 and Tier 4	General Tier 3 and Tier 5	Safety
22	0.00%	0.00%	0.10%
27	0.00%	0.00%	0.10%
32	0.03%	0.02%	0.40%
37	0.06%	0.04%	0.55%
42	0.20%	0.07%	0.65%
47	0.40%	0.09%	1.10%
52	0.60%	0.14%	3.75%
57	0.60%	0.14%	3.75%
62	0.60%	0.14%	4.25%
67	0.60%	0.14%	5.00%
70 and over	0.60%	0.14%	5.00%

Disability Incidence Rates (%)

Assumed Percentage of Future Disability Type

Membership Tier	Service-Connected Disabilities	Non-Service-Connected Disabilities
General Tier 1 and Tier 4	70%	30%
General Tier 3 and Tier 5	25%	75%
Safety	100%	0%



Termination

Years of Service	General	Safety
Less than 1	14.50%	9.00%
1 – 2	10.50%	7.00%
2 – 3	9.50%	6.00%
3 – 4	7.00%	5.00%
4 – 5	6.50%	3.50%
5 – 6	6.00%	3.50%
6 – 7	5.50%	3.00%
7 – 8	5.00%	2.50%
8 - 9	5.00%	2.25%
9 - 10	4.00%	2.00%
10 – 11	4.00%	2.00%
11 – 12	4.00%	2.00%
12 – 13	3.00%	2.00%
13 – 14	2.50%	1.80%
14 – 15	2.50%	1.50%
15 – 16	2.50%	1.40%
16 – 17	2.50%	1.30%
17 – 18	1.75%	1.20%
18 – 19	1.75%	1.10%
19 – 20	1.50%	1.00%
20 and over	1.50%	0.25%

Termination Rates (%)

The member is assumed to receive the greater of a refund of member contributions or the present value of a deferred retirement benefit.

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



Retirement rates

Age	Tier 1 Enhanced: <30 Years of Service	Tier 1 Enhanced: 30+ Years of Service	Tier 3 Enhanced: <30 Years of Service	Tier 3 Enhanced: 30+ Years of Service	Tier 1 Non-Enhanced
49	0.00%	0.00%	0.00%	25.00%	0.00%
50	4.00%	8.00%	4.00%	10.00%	3.00%
51	4.00%	10.00%	3.00%	5.00%	3.00%
52	4.00%	10.00%	3.25%	5.00%	3.00%
53	4.00%	10.00%	3.50%	5.00%	3.00%
54	8.00%	16.00%	5.75%	11.00%	3.00%
55	12.00%	30.00%	8.00%	15.00%	10.00%
56	12.00%	24.00%	8.00%	10.00%	10.00%
57	14.00%	22.00%	8.00%	10.00%	10.00%
58	15.00%	22.00%	8.50%	15.00%	10.00%
59	18.00%	22.00%	10.00%	20.00%	10.00%
60	20.00%	20.00%	11.00%	15.00%	25.00%
61	20.00%	20.00%	16.00%	18.00%	15.00%
62	22.00%	25.00%	20.00%	25.00%	40.00%
63	22.00%	30.00%	20.00%	25.00%	35.00%
64	22.00%	30.00%	20.00%	25.00%	30.00%
65	30.00%	30.00%	30.00%	32.00%	40.00%
66	40.00%	30.00%	32.00%	32.00%	35.00%
67	40.00%	30.00%	32.00%	30.00%	35.00%
68	40.00%	30.00%	30.00%	30.00%	35.00%
69	40.00%	30.00%	30.00%	30.00%	35.00%
70	40.00%	30.00%	35.00%	30.00%	35.00%
71	35.00%	35.00%	30.00%	30.00%	35.00%
72	35.00%	35.00%	30.00%	30.00%	35.00%
73	35.00%	35.00%	30.00%	30.00%	35.00%
74	35.00%	35.00%	30.00%	30.00%	35.00%
75+	100.00%	100.00%	100.00%	100.00%	100.00%

Retirement Rates (%) — General (Legacy)



Retirement Rates (%) — General (PEPRA)

Age	Tier 4 and Tier 5 <30 Years of Service	Tier 4 and Tier 5 30+ Years of Service
5 2	2 00%	2 00%
53	2.00%	3.00%
54	2.00%	3.00%
54	2.00%	3.00%
55	2.00%	4.00%
56	3.00%	5.00%
57	6.00%	6.00%
58	6.00%	6.00%
59	6.00%	8.00%
60	7.00%	8.00%
61	10.00%	12.00%
62	12.00%	15.00%
63	14.00%	17.00%
64	16.00%	20.00%
65	20.00%	25.00%
66	25.00%	25.00%
67	25.00%	25.00%
68	25.00%	25.00%
69	25.00%	25.00%
70	25.00%	30.00%
71	30.00%	30.00%
72	30.00%	30.00%
73	30.00%	30.00%
74	30.00%	30.00%
75+	100.00%	100.00%



Retirement Rates (%) — Safety

Age	Tier A Enhanced: <30 Years of Service	Tier A Enhanced: 30+ Years of Service	Tier C Enhanced	Tier A Non-Enhanced and Tier D and Tier E
43	5.00%	0.00%	0.00%	0.00%
44	5.00%	0.00%	0.00%	0.00%
45	5.00%	0.00%	2.00%	0.00%
46	5.00%	0.00%	1.00%	0.00%
47	5.00%	0.00%	4.00%	0.00%
48	10.00%	30.00%	4.00%	0.00%
49	20.00%	30.00%	20.00%	0.00%
50	22.00%	30.00%	20.00%	5.00%
51	20.00%	20.00%	12.00%	4.00%
52	16.00%	20.00%	12.00%	4.00%
53	16.00%	20.00%	12.00%	6.00%
54	16.00%	24.00%	18.00%	8.00%
55	16.00%	30.00%	18.00%	20.00%
56	18.00%	30.00%	15.00%	20.00%
57	18.00%	30.00%	15.00%	15.00%
58	18.00%	30.00%	15.00%	15.00%
59	18.00%	35.00%	25.00%	22.00%
60	18.00%	35.00%	25.00%	25.00%
61	20.00%	35.00%	25.00%	25.00%
62	20.00%	35.00%	25.00%	35.00%
63	20.00%	35.00%	30.00%	40.00%
64	35.00%	35.00%	35.00%	40.00%
65	35.00%	100.00%	100.00%	100.00%
66	50.00%	100.00%	100.00%	100.00%
67	50.00%	100.00%	100.00%	100.00%
68	50.00%	100.00%	100.00%	100.00%
69	50.00%	100.00%	100.00%	100.00%
70+	100.00%	100.00%	100.00%	100.00%



Inactive members

Current and Future Inactive Member Assumptions

Category	% of Future ¹ Inactive Members	Annual Salary Increases from Separation Date	Retirement Age
General with reciprocity	20%	3.55%	61
General without reciprocity	80%	N/A	60
Safety with reciprocity	50%	4.10%	53
Safety without reciprocity	50%	N/A	50

Inactive member benefit

Inactive members are assumed to receive the greater of an immediate refund of their member contributions or the present value of a deferred retirement benefit.

Future benefit accruals

1.0 year of service per year for full-time employees. Continuation of current partial service accrual for part-time employees.

Unknown data for members

- Same as those exhibited by members with similar known characteristics.
- If not specified, General members are assumed to be female and Safety members are assumed to be male.

Definition of active members

All active members of CCCERA as of the valuation date.

Form of payment

- All active and inactive members are assumed to elect the unmodified option at retirement.
- There is no explicit assumption for children's benefits.

¹ CCCERA provides the reciprocity status for current inactive members in the valuation census data.



Survivor assumptions

Current Active and Inactive Member Eligible Survivor Assumptions

Member Gender	% with Eligible Survivor at Retirement or Pre-Retirement Death	Eligible Survivor Age	Eligible Survivor Gender
Male member	70%	3 years younger than member	Female
Female member	55%	2 years older than member	Male

Active death optional form election

All active members with five or more years of service are assumed to elect the optional settlement 2 allowance that leaves a 100% continuance to their beneficiary upon the member's non-service connected pre-retirement death. For those who are assumed to be not married at pre-retirement death:

Active Death Optional Form Election Assumptions

Beneficiary Type	Percentage %	Age Difference with Active Member
Child	30%	30 years younger
Parent	30%	30 years older
Sibling and other	40%	Same age

Offsets by other plans of the employer for disability benefits

The Plan requires members who retire because of disability from General Tier 3 and General Tier 5 to offset the Plan's disability benefits with other Plans of the employer. We have not assumed any offsets in this valuation.

Leave cashout

General Tier 1, Tier 2 and Tier 3 & Safety Tier A and Tier C

Leave Cashout as Percentage of Final Average Pay

Cost Group	Leave Cashout
Cost Group 1	1.25%
Cost Group 2	0.60% for Tier 2 0.75% for Tier 3
Cost Group 3	5.50%
Cost Group 4	1.75%
Cost Group 5	0.75%
Cost Group 6	0.00%



Cost Group 7	0.50%
Cost Group 8	0.20%
Cost Group 9	0.00%
Cost Group 10	0.00%
Cost Group 11	3.00%
Cost Group 12	1.75%
Withdrawn Employers	0.00%

General Tier 4 and Tier 5 & Safety Tier D and Tier E None.

Service from accumulated sick leave

Additional Service Converted from Accumulated Sick Leave

Retirement Type and Membership Group	Converted Sick Leave as % of Service at Retirement
Service Retirements	
General	1.00%
Safety	1.70%
Disability Retirements	
General	0.08%
Safety	0.90%

Pursuant to Section 31641.01, the cost of this benefit for the non-PEPRA tiers will be charged only to employers and will not affect member contribution rates.

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STEPSTONE

CCCERA Board Presentation Private Debt Update

May 2025

NOTES

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All data is as of May 2025, unless noted otherwise.

Agenda

- I. StepStone Group Update
- II. What is Private Debt?
- III. Why Private Debt?
- IV. Review of Private Debt Program
- V. Private Debt Portfolio Performance

I. StepStone Group Update



Scale that delivers



All dollars are USD. Headcount as of December 31, 2024. Data include metrics of entities acquired by StepStone. Amounts may not sum to total due to rounding.

1. Total capital responsibility equals Assets Under Management (AUM) plus Assets Under Advisement (AUA). AUM includes any accounts for which StepStone Group has full discretion over the investment decisions, has responsibility to arrange or effectuate transactions, or has custody of assets. AUA refers to accounts for which StepStone Group provides advice or consultation but for which the firm does not have discretionary authority, responsibility to arrange or effectuate transactions, or custody of assets. \$698B in total capital responsibility includes \$179B in AUM and \$519B in AUA. Reflects final data for the prior period (September 30, 2024), adjusted for net new client account activity through December 31, 2024. Does not include post-period investment valuation or cash activity. NAV data for underlying investments as of September 30, 2024, as reported by underlying managers up to the business day occurring on or after 100 days following September 30, 2024. When NAV data is not available by the business day occurring on or after 100 days following September 30, 2024, such NAVs are adjusted for cash activity following the last available reported NAV.

2. \$70+ billion average annual private market allocations are for the average of the last three years ended December 31, 2024, and represent StepStone-approved investment commitments on behalf of discretionary and non-discretionary advisory clients. Excludes legacy funds, feeder funds and research-only, non-advisory services. Ultimate client investment commitment figures may vary following completion of final GP acceptance/closing processes.

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Private Debt

StepStone's Private Debt program leverages the Firm's global platform to target privately negotiated debt transactions across corporate, real estate, and infrastructure debt

\$65 BILLION total capital responsibility \$12 BILLION average annual approvals¹

75+ investment professionals

partners

18

All dollars are USD. Headcount as of December 31, 2024. Data include metrics of entities acquired by StepStone. Total capital responsibility equals assets under management (AUM) plus assets under advisement (AUA) and is presented as of December 31, 2024. Reflects final data for the prior period (September 30, 2024), adjusted for net new client account activity through December 31, 2024. Does not include post-period investment valuation or cash activity.

Average annual approvals are for the average of the last three years ended December 31, 2024. Amounts may not sum to total due to rounding. Approved figures represent StepStone-approved investment commitments on behalf of discretionary and non-discretionary advisory clients. Excludes clientele that receive research only, non-advisory services. Ultimate client investment commitment figures may vary following completion of final GP acceptance/closing processes. The Private Debt investment team consists of 59 team members, and leverages the debt expertise of the Firm's dedicated Real Estate, Distressed and Infrastructure professionals & partners, which are included in the headcounts presented above. Private Debt AUM/AUA and approved amounts include both Infrastructure and Real Assets debt and Real Estate debt.

1. Approved amount includes incremental fundings of recycled/reinvested capital above the initial approved amount stemming from the revolving nature of certain Private Debt programs.

Past performance is not indicative of future results and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.

StepStone Group corporate private debt team

Investment team partners





Marcel Schindler Partner, Zurich





Meinrad Wyser Partner, Zurich



Partner, Dublin

John Bohill

Fabian Körzendörfer Partner, Zurich

50+ dedicated investment / research professionals

Alesia Dawidowicz

Edward Panarese*

MD. Zurich

MD, NYC

Jared Root

MD, London

Rachel Gallagher

Information

technology

Director, Dublin

Advisors / private debt partners





Partner, Zurich

Partner, Zurich







Ariel Goldblatt

Partner, NYC

Hans-Jörg **Christian Hinze** Baumann Partner, Zurich Partner, Zurich



Partner, Zurich



Marc-André Mittermaver Partner, Zurich

Srdjan Vlaski

Eric Wieczorek

MD, New York Sean Dovle

MD. Dublin

Director, Dublin

Kenneth McLaughlin

Legal &

compliance

MD, Zurich

Aiyu Nicholson* Jan Kuhlmann Partner, NYC

Partner, Zurich

Mark Tsang

MD, London

MD, Dublin

Tod Trabocco

MD, New York

Gary Gipkhin

Director, NYC

5 Vice Presidents

Investor

relations

Bryan O'Dowd

Jovan Samardzic

MD. Zurich

David Han

MD, New York

Stefan Derungs

Director, Zurich

Martin Progin

Director, Zurich

5 Sr. Associates /

Data science &

engineering ("DSE")

8 Associates

Partner, Zurich Partner, Zurich

Thomas Häfliger

14 dedicated product specialists

Tobias Meier

Filippo Petrucci MD, Zurich	Marc Lickes MD, Zurich	Selin Pinarci MD, Zurich	Veith Riebow MD, Frankfurt	Supported b
Samar Abbas* MD, NYC	Michael Wator Director, Zurich	Adnan Ahmad Vice President, Zurich	Simon Geldreich Vice President, Zurich	75+
Austin Head-Jones Director, New York	Sebastian Schlaef Vice President, Zu	er Gavriyel Salci rich Vice President, Zurich	Betim Bunjaku Senior Associate, Zurich	Investment professionals / product specialist
Brian Delpit* Principal, La Jolla	Sera Jeon Associate, Zurich	Mao Kaneko Holland Associate, London	Gilles Dellenbach Senior Analyst, Zurich	20+
18 Sr. Analysts / 11 Analysts	Vivian Bernet Senior Analyst, Zu	rich Til Blättler Senior Analyst, Zurich		Real estate / Infradebt professional
Finance & accounting	Operational due diligence	Portfolio analytics & reporting ("SPAR")	Responsible investing & D&I	resources dedicate to private debt ²

1. MD and above of the Corporate PD Team; 2. including Finance & Accounting, Controlling, Risk Management, IT, Legal, Admin etc. *Part of the Investment PE Team *PE Distressed. Information as of April 2025.

Global US Manager Selection EU Manager Selection



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STEPSTONE GROUP

II. What is Private Debt?



Private debt specialized coverage

StepStone covers the full range of opportunities in the private debt market, including both performing and non-performing debt; we have the **flexibility**, **resources**, and **experience** to move where we believe opportunities are most attractive

StepStone Private Markets Intelligence ("SPI™") by StepStone

SPI, StepStone's proprietary private market research database, contains current information on over
18,000 GPs across over 48,000 funds.
Thereof 1,800 funds/managers are categorized as corporate private debt¹

Global private debt investment team member locations





The mighty middle market



Private credit characteristics

COMMON PRIVATE CREDIT CHARACTERISTICS:

Defensive risk adjusted returns

The asset class seeks to provide a strong absolute return profile across various market conditions.

Current income generation

Private credit offers opportunities for higher yields compared to many traditional fixed income securities.

Reduced volatility

The return of private credit has the potential to be smoother than publicly traded assets.

Enhanced diversification

Lower correlation with traditional asset classes, potentially reducing overall portfolio risk.



III. Why Private Debt?

Significant expansion of Private Debt market



Fears and Misconceptions

- 1. Growing too fast?
- 2. Misalignment of Private Lenders vs Banks?
- 3. Too much Risk through leverage?
- 4. Systemic Risk?

Global Private Debt market expansion as bank lending declines

USA	Europe	Asia
\$806B	\$288B	\$124B
High yield bonds ²	High yield bonds ²	High yield bonds ³
\$1,314B	\$290B	\$240B
Syndicated loans ²	Syndicated loans ²	Syndicated loans ⁴
\$1,080B+	\$459B+	▲ \$75B+
Private debt ¹	Private debt ¹	Private debt ⁵
Bank (~15%)	▼	🚊 Bank (~60%)

Data as of September 2022, unless otherwise noted.

- 1. Total Market Size Private Debt Pregin. Total Market Size for Private Debt covers Direct Lending, Mezzanine, Special Situations, Distressed Debt, Fund of Funds and Venture Debt as of June 2023.
- Source: High Yield Bonds based on Credit Suisse High Yield index, Bloomberg as of June 2023. Syndicated Loans LCD. Total Market Size for Syndicated Loans covers senior secured term loans with minimum initial term of one-year, minimum initial spread* of 125 basis points, with original funding amount of at least \$50M and bought and held by an institutional investor as of June 2023. *Spread refers to the difference in yield between syndicated loans and high yield bonds. The spread is typically expressed in basis points (bps), where 1 basis point equals 0.01%.
- 3. Source: Bloomberg Asia High Yield Bond Index.
- 4. Source: SSG estimates.
- 5. Based on SSG's observations and Preqin market size for Asia Direct Lending, data as of September 2022.

Private Debt strengths

Private Debt filling the gap

Supply / demand of credit	Private Debt fills the gap left by banks' retrenchment. Alternative Lenders are not just taking share from banks but also from the public markets (syndicated loans)
Quality of assets and lending terms	Private Debt firms lend to middle market businesses that are crucial to economies, like the US, at attractive lending terms benefiting LPs
No asset-liability mismatch	Fund terms ensure that investor "Equity" capital and underlying investments match, in contrast to banks that lend with longer maturities financed with short term deposits
Alignment of interest	Loans originated by Private Debt Managers are held in the Manager's investment vehicle in contrast to the bank syndication model (bank balance sheet holdings are minimal)
Leverage	Alternative Lenders generally have minimal (1:1) leverage, whereas bank balance sheets are often levered in excess of 1:6
Downside mitigation	Private Debt investments, particularly those with secured collateral or asset-backed structures, may offer a greater level of downside protection during market downturns compared to public equity or unsecured debt

Source: StepStone, as of Q4 2024.
Returns across asset classes



...with smaller drawdowns



Time period 31.03.2005 - 30.09.2024

Source: S&P500 Index, Bloomberg High Yield Index, Bloomberg Investment Grade Index, LCD Morningstar Leverage Loans Index and Cliffwater DL Index (Based on broad Cliffwater Direct Lending Index, which includes 30-50% Junior Debt. Senior Debt is expected to have lower drawdowns), as of September 2024.

Private Debt as replacement alternative to public debt and equity



The decade of debt: what happened since 2022?



Cumulative performance



Private Debt and Private Equity distributions



Source: StepStone SPAR Universe Benchmark. Full dataset and average annual distributions calculation covers from Q1 2005 to Q4 2024. Cumulative performance indexes: Cliffwater, Preqin, Bloomberg, as of December 2024.

Note: Distributions % of NAV calculated as annual global private equity distributions as a percentage of total NAV from the prior year. YTD distributions are divided by the NAV at the end of the prior year.

Private Debt - 'Steady ship in choppy waters'

2006	2007	2008	2009 EU HY 84.4% US HY 58.2%	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Annualize	ed Volatility
EU EQ 20.2% US EQ 15.8%	GFC ↓	US IG -4.9% EU IG -5.6%	38.2% US LL 51.6% EU LL 43.4% EU EQ 32.6% US EQ 26.5% US IG 18.7% EU IG 15.5%	Eu	rozone	EU HY 27.9% EU EQ 18.1% US EQ 16.0% US HY 15.8%	US EQ 32.4% EU EQ 20.5%	US EQ 13.7%	EU EQ 8.8%	US HY 17.1% US EQ 12.0%	US EQ 21.8% EU EQ 10.9%	riffs	US EQ 31.5% EU EQ 26.9% US IG 14.5% US HY 14.3% EU HY 11.4%	US EQ 18.4% US IG 9.9% US HY 7.1%	Rate r US EQ 28.7% EU EQ 25.8%	aise	US EQ 26.3% EU EQ 16.6% EU LL 13.5% US HY 13.4% US LL 13.3% EU HY 12.3%	US EQ 25.0%	US EQ 10.6%	
US DL 13.7%	US DL 10.2%	US DL -6.5%	US DL 13.2%	US DL 15.8%	US DL 9.8%	US DL 14.0%	US DL 12.7%	US DL 9.6%	US DL 5.5%	US DL 11.2%	US DL 8.6%	US DL 8.1%	US DL 9.0%	US DL 5.5%	US DL 12.8%	US DL 6.3%	US DL 12.1%	US DL 11.3%	US DL 9.6%	US DL 3.4%
US HY 11.8% EU HY 11.0% US LL 6.7% EU LL 6.4% US IG 4.3% EU IG 0.1%	USEQ 5.5% EU EQ 3.2% US IG 4.6% US LL 2.1% US HY 1.9% EU IG -0.3% EU LL -0.6% EU HY -3.0%	US HY -26.2% US LL -29.1% EU LL -30.0% EU HY -32.1% US EQ -37.0% EU EQ -43.3%		EU HY 15.3% US HY 15.1% US EQ 15.1% EU EQ 11.7% US LL 10.1% EU EQ 9.8% US IG 9.0% EU IG 5.5%	US IG 8.1% US HY 5.0% EU IG 2.6% US EQ 2.1% US LL 1.5% EU LL 0.7% EU HY -2.8% EU EQ -7.5%	EU IG 13.7% US IG 9.8% US LL 9.7% EU LL 9.7%	EU HY 10.2% EU LL 8.6% US HY 7.4% US LL 5.3% EU IG 2.1% US IG -1.5%	EU IG 9.1% US IG 7.5% EU EQ 7.4% EU HY 5.7% EU LL 4.5% US HY 2.5% US LL 1.6%	EU LL 5.5% EU HY 1.7% US EQ 1.4% EU IG -0.3% US IG -0.7% US LL -0.7% US HY -4.5%	US LL 10.2% EU HY 9.0% US IG 6.1% EU IG 5.9% EU LL 3.8% EU EQ 3.2%	US HY 7.5% EU HY 6.8% US IG 6.4% US LL 4.1% EU LL 3.6% EU IG 2.7%	EU LL 1.3% US LL 0.4% EU IG -1.6% US HY -2.1% US IG -2.5% EU HY -3.6% US EQ -4.4% EU EQ -10.0%	US LL 8.6% EU IG 6.7% EU LL 4.9%	EU IG 3.7% US LL 3.1% EU LL 2.4% EU HY 2.3% EU EQ -2.8%	US HY 5.3% US LL 5.2% EU LL 5.2% EU HY 3.5% US IG -1.0% EU IG -1.5%	US LL -0.8% EU LL -3.5% EU EQ -8.9% EU HY -10.7% US HY -11.2% EU IG -14.6% US IG -15.8% US EQ -18.1%	US IG 8.5% EU IG 8.2%	EU EQ 9.3% EU LL 9.2% US LL 9.0% EU HY 8.4% US HY 8.2% EU IG 4.1% US IG 2.1%	EU EQ 6.7% US HY 6.6% EU HY 6.6% US LL 5.0% EU LL 4.4% US IG 4.1% EU IG 2.8%	EU IG 5.2% US IG 6.8% US LL 9.4% EU LL 9.7% US HY 10.4% EU HY 12.9% EU EQ 15.8% US EQ 16.0%

Sources: Bloomberg and Cliffwater. For illustrative purposes only. The chart shows annual index total returns in USD for the following indices: US DL - Cliffwater Direct Lending Index, US EQ – S&P 500, EU EQ - MSCI Europe Index, US HY - Bloomberg US High Yield Index, EU HY - Bloomberg Pan-European High Yield Index, US IG - Bloomberg US Corporate Index, EU IG - Bloomberg Pan-European Corporate Index, US LL – Morningstar LCD US Leveraged Loan Index, EU LL – Morningstar LCD EU Leveraged Loan Index . Based on data until December 31, 2024.

Potential Impact of US Policies on Direct Lending Market

Trump 2.0 agenda

	Policies	Potential effects	Considerations for middle market borrowers & lenders
Fiscal policy	 Government spending cuts → DOGE Extend & additional personal tax cuts Reduce corporate tax further 	Economy:	 Macroeconomic tailwind through lower tax burden Higher earnings thanks to higher consumption spending Companies with government contracts may lose revenues
Deregulation	 Intentions to lower the regulatory burden on financial companies such as banks through a lighter Basel III Endgame proposal Lower regulations and environmental requirements for energy companies for new drilling and other projects. 	Economy: Earnings:	 Boost to private equity activity and M&A volume with potentially better lending terms for private lenders Lower regulations could incentivize banks to increase competition in the upper middle market and large caps
International trade	 Broad base tariffs hitting all countries Sectoral tariffs such as steel and aluminum, cars or semi- conductors aimed at bringing back manufacturing to the US High uncertainty regarding the final level of tariffs 	Economy: • Earnings: •	 Could upend supply chains and drive-up input costs Potential loss of market shares in foreign markets Uncertainty to put a pause on investment plans and large consumer spending
Immigration	 Strong crackdown on illegal immigration Tougher visa policies 	Economy: Earnings:	Middle market companies in sectors such as hospitality or healthcare may see upward pressure on wages

Considerations for direct lending

	Considerations & expectations	Expected trend	Assessment
Pricing / yields	 Base rate: uncertainty translates into a broad range of predictions; the forward curve assumes lower rates Primary spreads / OID: the recent tightening is expected to be reversed 		New capital: potential for an attractive vintage with higher spreads and tighter underwriting terms
Credit metrics	 Underwriting terms are expected to tighten in order to address increased uncertainty and an improved supply/demand environment Chances to migrate more in the direction of a lenders' market 		
Fundamentals	 Macro-economic environment could experience increasing headwinds Revenue & EBITDA growth will experience a wide range of outcomes, depending on the sector or industry as well as the ability to pass on costs and retain market share. 		Most important investment approach: diversification of portfolio and capital deployment channels
Volume	 New transactions / new money: uncertainty may result in a reduced M&A activity Refinancing / repayments: wider spreads and tighter underwriting terms make it harder / less attractive for borrowers Retrenchment from banks: bank lending may retrench in the face of high uncertainty, providing opportunities to private lenders 		

Tariffs' Impact on Private Debt – existing transactions

Topics	Comments
Differentiated regional impact	- US companies = affected by rising input costs as well as lower revenues
	- Trading partners = impact via lower revenues
Middle market vs. large cap	 Middle market companies = less reliant on global supply chains and thus are expected to be relatively less affected by the tariffs' negative impact
Sectoral vulnerability	 Sectors expected to be most affected: automotive, industrials, hardware technology, and consumer discretionary. Dominant sectors in the middle market are software technology, healthcare, business, and financial services
	 Impacts, however, will not be limited to first-order (input prices and tariff-induced sales declines) but also second-order effects. E.g. ripple effects in the supply chain of directly impacted businesses or general uncertainty-induced pullback of capex or consumption spending
	 Certain business models could be fundamentally challenged. Recovery rates in some cases might be materially below simple long-term averages and much more case-specific
Uncertainty and deal activity	- Uncertainty is expected to weigh on IPO, M&A, and build strategies, and hence primary deal activity is expected to remain low
	 A potential bank lending retrenchment due to higher uncertainty could provide opportunities for direct lenders to capture deal flow in the upper-middle market and large-cap market

Tariff induced macro scenarios

	Trade deal(s)	Liberation day	Trade war
	US reduces tariff rate considerably as "concessions" by trading partners are made	Tariffs will more or less take effect as announced Trading partners don't retaliate or only moderately	Trading partners retaliate US increases tariffs
Duration	6 - 12 months (of negotiations)	Tariffs remain in place at least 12 months	18+ months
Inflation	US inflation increases modestly Trading partners inflation not affected	US inflation increases significantly above FED target Trading partners inflation decreases	US inflation increases but off set by economic slow down Trading partners inflation increases moderately
GDP	US will decelerate modestly on the basis of political uncertainty not tariffs themselves Trading partners GDP declines as a result of tariffs and uncertainty China will not be able to avoid negative impact	US GDP growth decelerates Trading pattern's GDP decelerates more	US GDP declines / shallow recession Trading partners' GDP move to recession
Central banks	Continue on the paths expected end of 2024	FED will remain on the hawkish side to avoid "transitory" error again ECB will continue to ease monetary policy	Will ease monetary policy to support economies
Sectors negatively affected in US	Auto	Auto, consumer discretionary, industrials, hardware	All but telecom, utilities, healthcare
Sectors negatively affected in EU	Auto, industrials	Auto, industrials	All but telecom, healthcare

Stress test scenarios



Source: StepStone, as of April 2025. Analysis done using a portfolio with exposure to US and Europe with fundamentals as of 2024Q3. For illustrative purposes only. The opinions expressed herein reflect the current opinions of StepStone as of the date appearing in this material only. There can be no assurance that views and opinions expressed in this document will come to pass.

IV. Review of Private Debt Program

Summary

What has been done so far

- In April 2017, the CCCERA Board approved a Private Debt mandate and selected StepStone as implementation partner
- StepStone and CCCERA management worked closely to establish investment guidelines, the implementation of the mandate started in H2 2017, and the first separately managed account started investing in Q2 2018
- During bi-weekly calls and regular in-person meetings, investment opportunities are discussed, and an exchange of observations and market information is facilitated
- As of September 30th, 2024, the portfolio has committed a total of \$1,484m in line with the agreed-upon investment guidelines: **\$870m has been committed to Core managers**, **\$470m has been committed to Satellite funds** and **\$144m cumulatively has been funded to co-investments including recycled capital**
- In December 2024, StepStone expanded the portfolio by adding a \$200 million Upper Middle Market SMA as a Core manager, followed by a \$30 million primary fund in March 2025

2025 Outlook

- In H2 2025, StepStone plans to invest \$100m into two additional primary funds
- StepStone will continue to recycle capital for co-investments as investments are repaid

Portfolio construction

Implementation of Private Debt for CCCERA with allocation thresholds

Core

- Almost exclusively 1st lien
- Performing Credit only
- Application of leverage
- Target Net Return: 10-11%

SMA

Flexibility & Control

- Strategy
- Deployment
- Operations
- Costs



Satellite

- Can include higher yielding, riskier investments
- Performing and non-performing
- Limited leverage
- Target Net Return: >10%

Primaries

Fund Investments



Co-Investments & Secondaries

- Single transactions
- Selected and monitored by StepStone
- No leverage
- Target Net Return: >10%

Co-investments

- Accelerated deployment
- Reduced costs
- Additional diversification



Private Debt portfolio construction



Core

- Series B
 - 1 US Upper Middle Market DL SMA
- Series C
 - 1 US Mid Middle Market DL SMA
- Series D
 - 1 US Mid Middle Market DL SMA with Non-Sponsored Allocation
- Series E
 - 1 US Lower Middle Market DL SMA
- Series F
 - 1 US Upper Middle Market DL SMA with Non-Sponsored Allocation



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1 CLO Equity Fund

Data as of March 17, 2025. Target allocation represents percentage of total commitments.

1. Reflects the number of current borrowers in CCCERA's co-investment portfolio.

Pacing model



			Private Del	ot Program								
\$ in millions	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>
Total Projected Private Debt Program NAV	\$503	\$719	\$835	\$1,029	\$1,118	\$1,197	\$1,317	\$1,500	\$1,671	\$1,735	\$1,779	\$1,822
% of CCCERA Projected AUM	5.4%	7.1%	7.9%	9.2%	10.1%	10.4%	11.0%	12.1%	13.0%	13.0%	13.0%	13.0%
Total Gains (Losses) on Investments (p.a.)	\$35	\$62	\$66	\$139	\$121	\$130	\$138	\$156	\$176	\$190	\$195	\$200
Annual Net Capital Call from CCCERA ⁽¹⁾	\$591	\$178	\$94	\$151	(\$2)	\$14	\$103	\$168	\$163	\$107	\$119	\$145
Annual Distributions to CCCERA (not reinvested)	\$19	\$24	\$44	\$97	\$82	\$146	\$121	\$140	\$168	\$234	\$270	\$301
Net Funded Amount by CCCERA	\$572	\$154	\$50	\$54	(\$84)	(\$132)	(\$18)	\$27	(\$5)	(\$126)	(\$151)	(\$157)

1. Represents total annual capital called net of reinvested distributions.

For illustrative purposes only. Pacing Models are provided solely for illustrative purposes only. There can be no assurance that actual model will be similar to the model set forth on this slide or that the investment will achieve its investment objectives or avoid substantial losses. Pacing model patterns will vary depending on the activities of the underlying investment. This is a simplified example and may not represent the actual performance of the investment. Please let us know if you want to see a pacing model analysis based on assumptions other than those we have used for this analysis.

STEPSTONE GROUP 30

Past performance is not necessarily indicative of future results and there can be no assurance that the fund will achieve comparable results or avoid substantial losses

V. Private Debt Portfolio Performance

Private Debt performance summary

- As of September 30th, 2024, CCCERA's private debt portfolio comprised US\$1,484 million in cumulative commitments to the following investments: 4 SMAs, 10 Primary Funds and 29 Co-Investments⁽¹⁾
- The portfolio is performing in line with expectations, generating a Gross IRR and Net IRR of 10.4% and 9.8% since inception, respectively

US\$ in millions	30-Sep-24	30-Jun-24	30-Sep-23
	Performance S	tatistics	
Number of Managers	33	31	30
Number of Borrowers ⁽²⁾	426	422	415
Committed Capital	\$1,484m	\$1,509m	\$1,358
NAV	\$1,221m	\$1,184m	\$1,095m
Target Gross IRR	>10%	>10%	>10%
Gross IRR ⁽³⁾	10.4%	10.3%	9.9%
Net IRR ⁽⁴⁾	9.8%	9.8%	9.4%
	Portfolio Stat	istics ⁽²⁾	
Average Net Senior Leverage ⁽⁵⁾	4.7x	4.6x	4.6x
Average EBITDA ⁽⁵⁾	\$47m	\$47m	\$51m
Traditional 1 st Lien and Unitranche	97.9%	97.5%	98.2%

1. Reflects the number of current borrowers in CCCERA's co-investment portfolio as of March 17, 2025.

2. Represents the latest available reporting data as of the given date. Excludes investments in Real Estate Credit, Regulatory Capital, Opportunistic Lending and Asset Based Finance. Portfolio statistics only include current active investments.

- 3. Data reflects performance net of GP fees but gross of StepStone's fees.
- 4. Data reflects performance net of GP fees and StepStone's fees.
- 5. Excludes borrowers for which data is unavailable. Weighted average net senior leverage excludes values above 20.0x.

Source: StepStone Research

Past performance is not necessarily indicative of future results and there can be no assurance that the investment will achieve comparable results or avoid substantial losses.

For illustrative purposes only. Target returns are hypothetical and are neither guarantees nor predictions or projections of future performance. Future performance indications and financial market scenarios are no guarantee of current or future performance. There can be no assurance that such target IRRs will be achieved or that the investment will be able to implement its investment strategy, achieve its investment objectives or avoid substantial losses. Further information regarding target IRR calculations is available upon request. Gross IRR will ultimately be reduced by management fees, carried interest, taxes, and other fees and expenses.

Performance versus benchmarks

StepStone CC portfolio has outperformed the Cliffwater and S&P benchmarks through September 30, 2024



Benchmark Comparison - As of September 30, 2024

1. QTD IRR is not annualized.

2. Inception represents date of first capital call on February 12th, 2018.

3. StepStone CC IRR is net of underlying fund and investment fees, but not net of StepStone Advisory fees. Including Co-investment and Primary investments.

4. Cliffwater Direct Lending Index Total Return (TR) PME+ starts with the Long Nickels calculations and represents the opportunity cost comparison of how funds would have performed had they been invested in the public index using a coefficient to scale the fund's distributions so that the public market theoretical valuation remains positive.

Notes: The indices is shown for general market comparison and is not meant to represent any particular fund. An investor cannot directly invest in an index. Moreover, indices do not reflect commissions or fees that may be charged to an investment product based on the index, which may materially affect the performance data presented. Returns under one year are unannualized.

Past performance is not indicative of future results and there can be no assurance that the fund will achieve comparable results or avoid substantial losses.

Portfolio exposure¹

Fund Level Exposure

By Strategy



Fund Level Exposure²

By Manager



1. Exposure represents the sum of the (i) unfunded balance and the (ii) fair market value as provided by the general partner.

2. Managers represented for co-investments have brought their respective deals forward.

Portfolio exposure¹

Underlying Look-Through Exposure

By Sector



Industrials Consumer Discretionary Health Care Information Technology Materials Consumer Staples Communication Services Financials Real Estate Energy Utilities

Underlying Look-Through Exposure

By Geography



1. Exposure represents the sum of the (i) unfunded balance and the (ii) fair market value as provided by the general partner.

Cash flow analysis fund level

From January 1, 2023 to September 30, 2024, the Fund deployed \$226.0m to underlying investments



Deployment

By Manager





By Investment Structure Type



RISKS AND OTHER CONSIDERATIONS

Risks Associated with Investments. Identifying attractive investment opportunities and the right underlying fund managers is difficult and involves a high degree of uncertainty. There is no assurance that the investments will be profitable and there is a substantial risk that losses and expenses will exceed income and gains.

Restrictions on Transfer and Withdrawal; Illiquidity of Interests; Interests Not Registered. The investment is highly illiquid and subject to transfer restrictions and should only be acquired by an investor able to commit its funds for a significant period of time and to bear the risk inherent in such investment, with no certainty of return. Interests in the investment have not been and will not be registered under the laws of any jurisdiction. Investment has not been recommended by any securities commission or regulatory authority. Furthermore, the aforementioned authorities have not confirmed the accuracy or determined the adequacy of this document.

Limited Diversification of Investments. The investment opportunity does not have fixed guidelines for diversification and may make a limited number of investments.

Reliance on Third Parties. StepStone will require, and rely upon, the services of a variety of third parties, including but not limited to attorneys, accountants, brokers, custodians, consultants and other agents and failure by any of these third parties to perform their duties could have a material adverse effect on the investment.

Reliance on Managers. The investment will be highly dependent on the capabilities of the managers.

Risk Associated with Portfolio Companies. The environment in which the investors directly or indirectly invests will sometimes involve a high degree of business and financial risk. StepStone generally will not seek control over the management of the portfolio companies in which investments are made, and the success of each investment generally will depend on the ability and success of the management of the portfolio company.

Uncertainty Due to Public Health Crisis. A public health crisis, such as the recent outbreak of the COVID-19 global pandemic, can have unpredictable and adverse impacts on global, national and local economies, which can, in turn, negatively impact StepStone and its investment performance. Disruptions to commercial activity (such as the imposition of quarantines or travel restrictions) or, more generally, a failure to contain or effectively manage a public health crisis, have the ability to adversely impact the businesses of StepStone's investments. In addition, such disruptions can negatively impact the ability of StepStone's personnel to effectively identify, monitor, operate and dispose of investments. Finally, the outbreak of COVID-19 has contributed to, and could continue to contribute to, extreme volatility in financial markets. Such volatility could adversely affect StepStone's ability to raise funds, find financing or identify potential purchasers of its investments, all of which could have material and adverse impact on StepStone's performance. The impact of a public health crisis such as COVID-19 (or any future pandemic, epidemic or outbreak of a contagious disease) is difficult to predict and presents material uncertainty and risk with respect to StepStone's performance.

Taxation. An investment involves numerous tax risks. Please consult with your independent tax advisor.

Conflicts of Interest. Conflicts of interest may arise between StepStone and investors. Certain potential conflicts of interest are described below; however, they are by no means exhaustive. There can be no assurance that any particular conflict of interest will be resolved in favor of an investor.

Allocation of Investment Opportunities. StepStone currently makes investments, and in the future will make investments, for separate accounts having overlapping investment objectives. In making investments for separate accounts, these accounts may be in competition for investment opportunities.

Existing Relationships. StepStone and its principals have long-term relationships with many private equity managers. StepStone clients may seek to invest in the pooled investment vehicles and/or the portfolio companies managed by those managers.

Carried Interest. In those instances where StepStone and/or the underlying portfolio fund managers receive carried interest over and above their basic management fees, receipt of carried interest could create an incentive for StepStone and the portfolio fund managers to make investments that are riskier or more speculative than would otherwise be the case. StepStone does not receive any carried interest with respect to advice provided to, or investments made on behalf, of its advisory clients.

Other Activities. Employees of StepStone are not required to devote all of their time to the investment and may spend a substantial portion of their time on matters other than the investment.

Material, Non-Public Information. From time to time, StepStone may come into possession of material, non-public information that would limit their ability to buy and sell investments.

ESG Integration. While StepStone seeks to integrate certain ESG factors into its investment process and firm operations, there is no guarantee that StepStone's ESG strategy will be successfully implemented or that any investments or operations will have a positive ESG impact. Applying ESG factors to investment decisions involves gualitative and subjective decisions and there is no guarantee the criteria used by StepStone to formulate decisions regarding ESG, or StepStone's judgment regarding the same, will be reflected in the beliefs or values of any particular client or investor. There are significant differences in interpretation of what constitutes positive ESG impact and those interpretations are rapidly changing. The description of ESG integration herein is provided to illustrate StepStone's followed in every circumstance or at all.

Performance Information. No investment decisions may be made in reliance on this document. In considering performance information herein, readers should bear in mind that past performance is not necessarily indicative of future results and that actual results may vary. There can be no assurance that any StepStone fund will be able to successfully implement its investment strategy or avoid losses. Performance shown herein may include investments across different StepStone funds. The aggregate returns are not indicative of the returns an individual investor would receive from these investments. No individual investor received such aggregate returns as the investments were made across multiple funds and accounts over multiple years.



stepstonegroup.com



Appendix



Stress test methodology & assumptions

For all scenarios, a high-level industry assessment has been conducted to evaluate the vulnerability to first-order direct impacts from tariffs.

Using the macro assumptions and the results of the industry assessment, we stress borrowers' EBITDA growth assumptions.

In addition, across all scenarios, we also stress recovery rate assumptions using the industry-level assessment; lower recovery rates have been assigned to industries assessed as being most vulnerable to tariffs. To derive the loss rates, we use our assumptions on GDP growth, inflation, and interest rates to derive their impact on EBITDA growth, EV multiples, and interest payments for borrowers.

Those stressed metrics will in turn affect credit metrics such as LTV and fixed charge coverages (FCC).

Using StepStone's internal credit rating methodology, which is informed by the mentioned credit metrics, we then use these newly stressed credit metrics to cause a rating migration.

Knowing the loss rates associated with each credit rating for each scenario this rating migration will cause an increase in the loss rates associated with the underlying borrowers.

The borrower-specific expected loss rates are then aggregated to a single stressed expected loss rate for each scenario. We derive the returns by adding the weighted average loan spread to the scenario's short-term rates assumption to determine the gross asset yield for each scenario.

Then the respective stressed expected realized losses are deducted from these gross asset yields.

Finally, impairment charges which have been estimated as twice the realized losses are deducted to arrive at the respective scenario returns. It is important to note that impairments that did not result in realized losses will revert in the following years which will increase returns for those subsequent years.

Uncertainty

Economic policy uncertainty index





Trade policy uncertainty index





Market reaction to tariffs – FX and rate cuts





Jul 25 /Aug 25

Fed

Apr / May 25

Jun 25

Sep 25

ECB BoE

Source(s): Bloomberg. As of April 2025

Dec 25

Oct 25 /Nov

25

Market reaction to tariffs – treasury yields



European yields



Source(s): Bloomberg. As of April 2025

Market reaction to tariffs - total returns



Total returns following announcement (3rd April)





Market reaction to tariffs - credit markets

Dec 2A

NOV2A

Jan 25

-US IG

48025

Mar 25

EU IG

P6125

Credit markets yields

8%

6%

4%

2%

0%

APT 24



(3-Year Life US LLI; YTM for ELLI; HY and IG YtW)

Credit markets secondary spreads

In bps (3-Year Life for LL; STW for HY and IG)



Source(s): Bloomberg. As of April 2025

Jun 2A

20

JU12A

Sep 24

Oct 2A

– US HY – EU LLI – EU HY –

11924

Market reaction to tariffs - volatility

VIX index

30-days moving average



MOVE index

30-days moving average



Source(s): Bloomberg. As of April 2025

Energy prices and inflation expectations

Energy prices



US consumer inflation expectations

Year-over-year growth, in %, U, Michigan Consumer and New York Fed Surveys



Source(s): Bloomberg. As of April 2025

Donald Trump polls & consumer confidence

US Donald Trump polls 80 70 60 50 40 30 20 10 0 Jul 15 Jul 16 Jul 17 Jul 18 Jul 19 Jul 20 Jul 22 Jul 23 Jul 24 Jul 21 - Favorable

US consumer confidence indices

160



Source(s): RealClear Politics, Bloomberg. As of April 2025

Scenarios for stress testing

			GDP	Inflation	Policy rate
		US	2%	2.4%	3.87%
Before April 8 (end 2024)		EU	1.0%	1.9%	2.28%
Before April 8 (end 2024) - Trade deal(s) - No deal - Trade war -		UK	1.3%	2.6%	4.13%
	- Tariffs are removed or reduced $ ightarrow$ ~10-15% US effective tariff rate	US	1.5 – 2.0%	3.0 - 3.5%	3.75 - 4.0%
Trade deal(s)	 US trade partners do not retaliate to the US imposed tariffs. Mild inflationary pressure → Fed can still lower rates. 	EU	0.5 - 1.0%	1.8 – 2.3%	1.75 -2.25%
	- The ECB and the BoE cut rates to support economic growth.		0.5 – 1.0%	2.5 – 3.0%	3.5 - 4.0%
	- Tariffs remain in place \rightarrow ~20% US effective tariff rate	US	0.5 – 1.0%	3.5 - 4.5%	4.25- 4.5%
No deal	 Os trade partners do not retainate to the Os imposed tarins. Higher inflationary pressure → Fed keeps rates higher to avoid unanchoring inflation expectations. 			1.5 – 2.0%	1.0 – 1.5%
	 The ECB and the BoE cut rates more aggressively in order to support economic growth which will be slowing as European companies lose market share in the US market. 	UK	0.0 - 0.5%	2.0 – 2.5%	2.5 - 3.0%
	 Tariffs remain in place & additional tariffs are introduced for certain sectors and due to trade partners' retaliations → ~25% US effective tariff rate 	US	-1.0 - 0.0%	4.0 - 4.5%	3.0 - 3.25%
Trade war	- US trade partners do retaliate to the US imposed tariffs.	EU	-1.51.0%	2.0 – 2.5%	1.5 – 2.0%
	 Higher inflationary pressure & low consumer confidence, increased trade barriers, and uncertainty prove a drag on growth which pushes the US into a recession and lead the Fed to cut rates aggressively. The ECB and the BoE are more limited in their ability to cut rates to support economic growth which, combined with the lost of market share in the US market, will push both regions into a recession. 	UK	-1.51.0%	3.0 - 3.5%	3.0 - 3.5%

High-level industry assessment

The vulnerability to tariff industry-level assessment is done both for Europe and the United States as it is expected that not only different industries will be affected but that given industries will also be affected differently across regions (input costs vs. sales).

To have a reliable baseline for the assessment, we use a recent (March 2025) Fitch Ratings study that does a similar assessment of industry vulnerability to tariffs and looks at direct and indirect factors.

For our assessment we only use the direct factors (i.e., first-order) as we assume that the indirect factors will be taken care of through our macroeconomic assumptions.

We make use of the Fitch assessment on supply-chain risk for input costs and their assessment for exports to the US (for EU firms), price elasticity of demand, and vulnerability to retaliatory measures (for US firms) to assess the impact on sales.

Global Corporate Sectors - Implications of Higher US Tariffs

Europ	e	US & Cana	da	LATAM	c	ihina
Sector	Sub-sector	Overall impact	Exports to the US	Direct factors Increased competition from diversion to non-US markets	Supply- chain risk	Indirect facto Slower economic growth
	Chemicals	High	High	High	Low	High
Natural	Oil & gas	Medium	Low	Low	Low	Medium
Natural resources	Metals & mining	Medium	Low	Medium	Low	Medium
	Pulp & paper	Medium	Low	Medium	Low	Medium
	Pharma	Medium	Medium	Low	Low	Medium
Healthcare	Providers	Medium	Low	na	Medium	Medium
	Medtech	Medium	Medium	na	Medium	Medium
	Staples	Low	Low	Low	Low	Low
	Discretionary	Medium	Medium	Medium	Low	Medium
C	Commodity processors	Low	Low	Medium	Low	Low
goods	Alcohol	Medium	High	na	Low	Medium
	Protein	Medium	Medium	Low	Low	Medium
	Tobacco	Medium	Medium	Low	Low	Medium
	Packaged food	Medium	Low	Low	Low	Medium
	Hotels	Medium	na	na	na	Medium
Gaming, lodging	Restaurants	Medium	na	na	na	Medium
	Gaming	Low	Low	na	na	Low
	Food or staples	Low	na	na	Low	Low
Retail	Non-food or discretionary	Medium	Medium	Medlum	Low	Medium
Dealastata	REITs	Low	na	na	na	Low
Real estate	Homebuilders	Medium	na	na	Medium	Medium
	Automotive		Medium	Medium		High
	Building materials	Low	Low	Low	Low	Medium
Industrials	Building products	Low	Low	Low	Low	Medium
	Aerospace & defense	Low	Low	Low	Low	Low
	Diversified ind.	Medium	Medium	Medium	Medium	Medium
	Technology (hardware)		Medium	Low		Low
тмт	Technology (software)	Medium	Low	Low	Low	Medium
	Telecom	Low	Low	Low	na	Low
	Media	Medium	na	na	na	Medium
	Services	Medium	Low	na	na	Medium
Utilities	Utilities	Low	na	Low	Low	Low
Airlines	Airlines	Medium	Low	Low	Medium	Medium

Note: na - not applicable for this sector in this r Source: Fitch Ratings

FitchRatings

Global Corporate Sectors - Implications of Higher US Tariffs

Europ	æ	U	6 & Canada		LATAM	с	hina
Sector	Sub-sector		Overall impact	Supply- chain risk	Direct fact Price elasticity of demand	tors Vulnerability to retaliatory measures	Indirect factor Slower economic growth
	Chemicals		Medium	Low	Low	Medium	Medium
Matural	Oil & gas		Medium	Low	Low	Low	Medium
resources	Metals & minin	2	Medium	Low	Low	Low	Medium
	Pulp/Paper/Pa	kaging	Medium	Low	Low	Low	Medium
	Pharma	Pharma		Medium	Low	Medium	Low
Healthcare	Providers		Low	Low	Low	Low	Low
	Medtech		Medium	Medium	Low	Low	Low
	Staples		Low	Medium	Low	Low	Medium
	Discretionary		Medium	Medium	Medium	Low	High
	Commodity pro	cessors	Low	Low	Low	Low	Low
Consumer	Alcohol		Medium	Medium	Medium	Medium	Medium
goods	Protein		Medium	Low	Medium	Medium	Low
	Tobacco		Low	Low	Low	Low	Low
	Packaged food		Low	Low	Low	Low	Medium
	Hotels		Low	Low	Low	na	Medium
Gaming, lodging	Restaurants		Medium	Medium	Medium	Low	Medium
ocleisure	Gaming		Low	Low	Low	Low	Medium
	Food or staples		Low	Medium	Low	Low	Medium
Retail	Non-food or discretionary		Medium	Medium	Medium	Low	High
	REITs		Low	Low	Low	Low	Medium
Keal Estate	Homebuilders		High	Medium	High	Low	High
	Automotive		High	High	High	Low	Medium
	Building materi	als	Medium	Medium	Medium	Low	Medium
Industrials	Building produ	:ts	Medium	Medium	Medium	Low	Medium
	Aerospace & de	fense	Medium	Medium	Low	Medium	Low
	Diversified ind.		Medium	Medium	Medium	Low	Medium
	Technology (ha	rdware)	Medium		Medium	Low	Medium
	Technology (so	itware)	Low	Medium	Low	Low	Low
TMT	Telecom		Low	Medium	Low	na	Low
	Media & Enter.		Medium	na	Low	na	
	Services		Low	Low	Low	Low	Medium
1141041	Utilities		Low	Low	Low	Low	Low
ounities	Midstream		Low	Low	Low	Low	Low
Airlines	Airlines		Medium	Medium	Low	Low	Medium

Note: na - not applicable for this sector in this regio Source: Fitch Ratings

FitchRatings
What is corporate Private Debt?

	Bank Lending	Private Debt
Company Size	Typically, larger companies Earnings of USD50 to USD75m+	Middle-market companies Earnings of USD5m to USD75m
Sourcing	Bank balance sheets	Loans are privately sourced from one to a few specialist lenders
Liquidity	No opportunity to sell	Limited opportunities to sell
Company Type	Public and private companies	Typically, private companies
Interest Rate	Typically, floating interest rate	Typically, floating interest rate
Due Diligence	Limited due diligence	Full and rigorous due diligence
Reporting	Borrowers required to report every 3-6 months to the bank	Greater reporting requirements for borrowers

Direct lending valuations

Unrealized and realized losses

In %, BDC universe



LTM Net Realized Gains (Losses)



Tim Price

Chief Investment Officer

Liquidity Sub-portfolio Review

May 7, 2025

Role of Liquidity in CCCERA Portfolio





Liquidity

- The Liquidity Sub-portfolio is the cornerstone of the FFP.
- Using actuarial projections, we model each month's projected benefit payment.
- The benefit payment cash flow model is then used to build the investment program.
- Through contractual income, trading and maturing debt, the Liquidity sub-portfolio provides the necessary monthly cash flow to make benefit payments.

Objectives

Match 2-3 years of benefit payments with high certainty

Produce cash flow to match monthly benefit payment



Refreshing the Program

- The Liquidity Sub-Portfolio is topped up annually in July in conjunction with the employer pre-payments.
- The Portfolio operates in a drawdown mode for the next 11 months before the process starts again.
- The game plan for how to refresh the Liquidity Sub-Portfolio is communicated to the Board in the **Annual Funding Plan** which is presented annually.





Providing Benefit Payments

Benefit payments are accounted for over the year, and follow a process of dollar value estimation, which flows to liquidity program sizing and the annual funding plan, through to the accounting function of disbursement.

Annual	Semi-Annual	Monthly
CCCERA receives updates to benefit projections from actuaries	CCCERA Investment Staff reviews tracking of actual benefit payment sizing versus initial estimate, and adjusts	Benefit payments are disbursed from bank
Updated benefit projections are reviewed by Insight, which seeks to match each discrete benefit payment	subsequent six months of liquidity program cash flows accordingly	
CCCERA Investment Staff "tops up" the liquidity program during the Annual Funding Process	Several months of benefit payments are scheduled at custodial bank	



Board Input

The Board's input is needed for critical aspects of the Liquidity Sub-portfolio.

- Duration of benefit payments to be matched. This will be reviewed later this year in the Asset/Liability study which is conducted every 3-5 years.
- 2. Board affirmed using 3 years of matching benefit payments in 2024.
- 3. Board can authorize reducing the target number benefit payments by one year for rebalancing in extraordinary market environments.

Board Decisions

Board chose to match 3 years of benefit payments

Assets have not been used to opportunistically rebalance to date



Liquidity Sub-Portfolio Characteristics

- Highly Liquid. Tight bid ask spread, relatively easy to sell in a down market.
- **High Credit Quality.** All assets are A-rated or better, high credit quality provides resilience in downturns.
- Short Duration. All assets are short maturities, short duration and thus less sensitive to rate shocks.



Manager Structure

- Utilizes a multi-manager approach to produce unique income and liquidity profile.
- Current Manager Roles
 - Sit Fixed Income: ~40% allocation when fully funded. Invests in seasoned government-guaranteed securities that pay robust coupons. Income stream pulled monthly, and we can liquidate assets on an as-needed basis.
 - DFA: ~22% allocation when fully funded. Invests across a wide range of fixed income assets using **quantitative model** in order to build characteristics into the aggregate portfolio. We pull a set amount from the portfolio monthly and give DFA discretion on where and how to raise the necessary cash.
 - Insight: ~38% allocation when fully funded. Invests in a "buy and maintain" portfolio of short-duration, high quality securities designed to complete the needed CCCERA cash flows monthly. Insights builds and maintains the CCCERA cash flow profile based upon actuarial projections.



Liquidity Program Manager Contributions to Annual Benefits, in \$MM

Market Environment

- Inflation remains above long term target
- Economy contracted in the first quarter of 2025
- The first order effects of any tariffs will be inflationary



Fed's Dual Mandate

- Unemployment 4.2% (green), Headline CPI 2.4% (blue) and Core PCE 2.8% (red)
- Headline CPI peaked in June of 2022 at 9.1%



Inflation Measures

Headline CPI

- Consumer's experience
- Used in Social Security COLA
- Component weights consistent, based on household surveys
- More weight to shelter

Core PCE

- Fed's primary inflation gauge
- Excludes volatile food, energy
- Component weights change reflecting consumer substitutions, business surveys

10

Rate Environment

- Curve "normalizing," yet still inverted in short end: 10-year yield unchanged at 4.20%.
- Yield in the Liquidity Sub-Portfolio is 5.1% vs 2.8% PCE inflation for a 2.3% real rate of return.





Corporate Credit Spreads



CCCERA

Macro Factors: Forecasts versus Actual

Macro Consensus Forecasts and Actuals								
	20225	20224	2023	2024E	20244	2024	20255	20245
	ZUZJE	ZUZJA	Delta	2024C	2024A	Delta	ZUZJE	ZUZOE
GDP	3.3%	2.9%	-0.4%	2.5%	2.8%	0.3%	I.4%	I.6%
Unemployment	3.7%	3.6%	-0.1%	4.1%	4.0%	-0.1%	4.6%	N/A
CPI	3.2%	4.1%	0.9%	2.7%	3.0%	0.3%	3.5%	2.6%
Fed Funds Rate	5.5%	5.5%	0.0%	4.5%	4.5%	0.0%	4.0%	3.5%
2-yr UST	4.6%	4.3%	-0.3%	4.1%	4.2%	0.1%	3.6%	3.5%
I0-yr UST	4.1%	3.9%	-0.3%	0.0%	4.6%	4.6%	4.1%	4.1%

Source: Bloomberg Economic Forecasts (April 26, 2025)



Policy Rate: Function of GDP and Inflation

Taylor Rule*							
	2020	2021	2022	2023	2024	2025E	2026E
GDP	-2.2%	6.1%	2.5%	2.9%	2.8%	1.4%	I.5%
Core PCE	1.3%	3.6%	5.4%	4.2%	2.8%	3.0%	2.6%
Fed Funds by the Rule	-0.9%	9.7%	7.9%	7.1%	5.6%	4.4%	4.1%
Actual Fed Funds	0.3%	0.3%	4.5%	5.5%	4.5%	4.0%	3.5%
Delta (Rule - Actual)	-1.1%	9.4%	3.4%	1.6%	1.1%	0.5%	0.7%

*Simplified for illustrative purposes Source: Bloomberg, April 26, 2025



Liquidity Sub-Portfolio I-Year Return: 6.0%

- Liquidity Portfolio outperformance driven by short duration less rate sensitive assets.
- Liquidity Portfolio is of high credit quality, but credit risk was not a significant driver of returns.
- Lower yielding assets mature and are replaced with higher yielding assets returns increasing portfolio returns.

	3/31/2025				12/31/2024		
	YTD	l Yr.	3 Yrs.	5 Yrs.	l Yr.	3 Yrs.	5 Yrs.
Liquidity Sub-Portfolio	1.8%	6.0%	3.6%	2.2%	5.0%	2.1%	I. 9 %
US Corp & Govt 1-3, BBB	1.6%	5.5%	3.0%	1.4%	4.2%	1.6%	1.5%
DFA	1.3%	5.6%	3.5%	I. 9 %	5.7%	1.7%	I.5%
BofA US Corp & Govt 1-5	2.0%	5.8%	2.9%	1.3%	3.9%	1.0%	1.3%
INSIGHT SHORT	I.4%	5.8%	4.1%	3.1%	5.3%	3.2%	2.5%
BBG US Agg Govt Credit 1-3	1.6%	5.6%	3.1%	1.6%	4.4%	1.7%	1.6%
SIT SHORT DURATION	2.5%	6.5%	3.2%	1.4%	4.3%	1.3%	I.5%
BBG US Gov 1-3 Years	1.6%	5.4%	2.9%	1.2%	4.0%	1.4%	1.4%



Liquidity Managers: Relevant Statistics

Metric	Description				
Credit	Credit quality informs investors of a bond or bond portfolio's				
Quality	credit worthiness of fisk of default.				
	Independent rating services such as Standard & Poor's, Moody's Investors Service and Fitch Batings Inc. provide evaluations of a	C			
	bond issuer's financial strength, or its ability to pay a bond's principal and interest in a timely fashion.	C			
Duration	Duration is a measure of the sensitivity of the price of a fixed- income investment to a change in interest rates. Duration is a	Y N			
	bond maturity.				
Coupon	A coupon is the annual interest rate paid on a bond, expressed as a percentage of the face value.				

Characteristics as of 12/31/24

	Sit	Insight	DFA
Credit Quality	AAA	A+	A+
Duration	2.7	1.3	0.3
Coupon	5.9%	3.7%	3.7%
Yield to Maturity	5.8%	4.8%	5.2%



Conclusion

- Liquidity sub-portfolio is meeting its core requirement to provide cash flow to meet monthly benefit payments.
- Higher yielding environment provides sets up the portfolio for better future returns.
- Market environment remains uncertain, but the rate curve has largely normalized.
- Performance over the past year has improved and the program is beating its benchmark over trailing time periods.







MEMORANDUM

Date:	May 7, 2025
То:	CCCERA Board of Retirement
From:	Colin Bishop, Deputy Chief Executive Officer
Subject:	Consider and take possible action to authorize the CEO to renew a maintenance and support agreement with CPAS Systems, Inc.

Summary

Since 2009, CCCERA has had a maintenance and support services agreement with CPAS Systems, Inc. for its pension administration software system. It is renewed on an annual basis. These services include maintenance updates and overall system support services. This renewal is necessary for continued operation of the CPAS system as the new pension software is implemented and we continue to process, review and compare data in the CPAS system. We expect that after this current renewal, we will sunset the CPAS system and no longer require maintenance and support. The amounts for this renewal are \$40,980.87 for maintenance and \$26,880.00 for system support services. This is a 3% increase compared to the prior year, which is consistent with previous agreements.

Recommendation

Consider and take possible action to authorize the CEO to renew a maintenance and support agreement with CPAS Systems, Inc.



Public Pension Funding Forum



The Public Pension Funding Forum brings together public pension professionals for three days of valuable research, expert presentations, and engaging discussions. This event highlights emerging funding solutions and case studies, offering practical insights into the effectiveness of various pension reform initiatives. Learn more about the Public Pension Funding Forum, view the 2025 Preliminary Agenda and sign up here to be notified about event updates.

SAVE THE DATE

August 17–19, 2025 University of Chicago- David Rubenstein Forum Chicago, IL

2025 PRELIMINARY AGENDA

We are excited to share that the *Preliminary Agenda* is now available! Get a first look at the dynamic lineup of sessions, speakers, and events planned.

REGISTRATION

Registration for the 2025 Public Pension Funding Forum will open in May 2025. <u>Sign up here to be notified when registration</u> opens.

HOTEL RESERVATIONS

Join us at The Study Hotel at the University of Chicago, the host hotel for the 2025 Public Pension Funding Forum. Enjoy stunning views of Campus and Lake Michigan while only being stay steps away from the Forum.

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Funding Forum Agenda

2025 PRELIMINARY AGENDA

(As of 4/2/2025)

SUNDAY, AUGUST 17

3:00 PM – 6:00 PM REGISTRATION

4:30 PM – 4:45 PM Welcome and Program Overview *Michael Kahn, NCPERS*

4:45 PM - 5:30 PMMercer CFA Institute Global Pension IndexDavid Knox, Lead Author and Senior Partner, Mercer

MONDAY, AUGUST 18

- 7:00 AM 6:00 PM REGISTRATION
- 7:00 AM 8:00 am BREAKFAST
- 8:00 AM 5:30 PM GENERAL SESSION I
- 8:00 AM 8:15 AM Welcome & Opening Remarks Hank Kim, NCPERS
- 8:15 AM 9:00 AM A Perspective on Best Practices in U.S. Public Pensions *Keith Brainard, NASRA*
- 9:00 AM 9:45 AM Could Successful Retirement Systems Offer a Roadmap for Others? David Draine, PEW
- 9:45 AM 11:00 AM Panel Discussion: How Are Pension Plans Improving Their Funding Status and Making Contributions Above What's Required?

Moderator: Tyler Bond, NIRS Ryan Barrow, Kentucky Public Pension Authority Robert (Andy) Blough, Indiana Public Retirement System Jeffrey Fleck, West Virginia Consolidated Public Retirement Board John Herrington, Retirement Services Division, Office of the State Comptroller, Connecticut (Invited) Tyler Cummings, Nebraska Public Employee Retirement Systems (Invited)

11:00 AM - 11:15 AM REFRESHMENT BREAK

11:15 AM – 12:15 PM Understanding Amortization: What's the Relationship Between Layered Amortization and Funding Status? *Moderator: Dan Doonam, NIRS Todd Tauzer, Segal Elizabeth Wiley, Cheiron Paul Angelo, Retired Actuary*

- 12:15 PM 1:15 PM NETWORKING LUNCH
- 1:15 PM 2:00 PM Interaction Between Public Pension Funds and Financial Markets *Tyler Bond, NIRS Katie Comstock, AON*
- 2:00 PM 2:45 PM Strategic Plan: A Way to Making Pension Plans the Best they Can Be Denise Bradford, CalSTRS
- 2:45 PM –3:00 PM REFRESHMENT BREAK
- 3:00 PM 3:45 PM The New Corporate Governance Luifi Zingales, Chicago Booth, University of Chicago
- 3:45 PM 5:00 PM Public Funding Challenge Winning Student Team, Harris School, University of Chicago
- 5:30 PM –6:30 PM NETWORKING RECEPTION

TUESDAY, AUGUST 19

- 7:00 AM 12:00 PM REGISTRATION
- 7:00 AM 8:00 AM BREAKFAST
- 8:00 AM 12:00 PM GENERAL SESSION II
- 8:00 AM 8:15 AM Welcome back Hank Kim, NCPERS

8:15 AM – 9:15 AM	Characteristics of a Great Pension Plan: An Actuarial and Fiscal Sustainability
	Perspective
	Gene Kalwarski, Cheiron
	Michael Kahn, NCPERS
9:15 AM – 10:15 AM	Characteristics of a Great Public Pension Plan: An Investment Perspective
	David Wilson, Nuveen
10:15 AM – 10:30 AM	REFRESHMENT BREAK
10:30 AM11:30 AM	Outlook for the U.S. Economy in 2025 and Beyond
	David Altig, Federal Reserve Bank of Atlanta
11:30 AM –12:00 PM	THANK YOU & CLOSING REMARKS
	Hank Kim and Michael Kahn, NCPERS

CONTINUING EDUCATION (CE) CREDITS

By attending the Public Pension Funding Forum, you can earn **11 Continuing Education (CE) hours** toward your Accredited Fiduciary (AF) recertification and/or state-mandated continuing education requirements. CE credits are automatically recorded in your NCPERS membership account after the conference, where you can log in to download your CE certificate.

NCPERS is an accredited Minimum Educational Training (MET) sponsor for Texas public retirement systems, as recognized by the State Pension Review Board. This accreditation does not imply an endorsement by the Board regarding the quality of the MET program.

Additionally, NCPERS is a recognized learning provider and continuing education sponsor in multiple states. Attendees are encouraged to check with their state's requirements to confirm CE eligibility.

Event Registration

Annual Conference & Exhibition (ACE)

Center for Online Learning

Chief Officers Summit

FALL Conference

Legislative Conference & Policy Day

NCPERS Accredited Fiduciary (NAF) Program

NCPERS University

Pension Communications Summit

Program for Advanced Trustee Studies (PATS)

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Public Pension HR Summit

Public Safety Conference

Trustee Educational Seminar (TEDS)

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