LIVE VIRTUAL BOARD MEETING

OCTOBER 14, 2020 AT 9:00 AM
BOARD OF INVESTMENTS MEETING

TO VIEW VIA WEB

https://members.lacera.com/lmpublic/live_stream.xhtml

TO PROVIDE PUBLIC COMMENT

You may submit a request to speak during Public Comment or provide a written comment by emailing PublicComment@lacera.com. If you are requesting to speak, please include your contact information, agenda item, and meeting date in your request.

Attention: Public comment requests must be submitted via email to PublicComment@lacera.com no later than 5:00 p.m. the day before the scheduled meeting.

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION
300 N. LAKE AVENUE, SUITE 650, PASADENA, CA

AGENDA

A REGULAR MEETING OF THE BOARD OF INVESTMENTS

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

300 N. LAKE AVENUE, PASADENA, CALIFORNIA 91101

9:00 A.M., WEDNESDAY, OCTOBER 14, 2020

This meeting will be conducted by teleconference under the Governor's Executive Order No. N-29-20.

Any person may view the meeting online at
https://members.lacera.com/lmpublic/live_stream.xhtml

The Board may take action on any item on the agenda, and agenda items may be taken out of order.

I. CALL TO ORDER

II. APPROVAL OF MINUTES

A. Approval of the Minutes of the Regular Meeting of September 9, 2020

III. REPORT ON CLOSED SESSION ITEMS

IV. PUBLIC COMMENT
(*You may submit written public comments by email to PublicComment@lacera.com. Please include the agenda number and meeting date in your correspondence. Correspondence will be made part of the official record of the meeting. Please submit your written public comments or documentation as soon as possible and up to the close of the meeting.

You may also request to address the Boards. A request to speak must be submitted via email to PublicComment@lacera.com no later than 5:00 p.m. the day before the scheduled meeting. Please include your contact information, agenda item, and meeting date so that we may contact you with information and instructions as to how to access the Board meeting as a speaker.)

V. CHIEF EXECUTIVE OFFICER'S REPORT
(Memo dated September 23, 2020)

VI. CHIEF INVESTMENT OFFICER'S REPORT
(Presentation dated October 14, 2020)

VII. CONSENT ITEMS

A. Recommendation as submitted by Wayne Moore, Chair, Credit and Risk Mitigation Committee: That the Board approve re-categorizing the investment in PIMCO Tactical Opportunities (Tac Opps) Onshore Fund L.P. to LACERA's Illiquid Credit portfolio as advanced by the Credit and Risk Mitigation Committee. (Memo dated September 30, 2020)

B. Recommendation as submitted by Wayne Moore, Chair, Credit and Risk Mitigation Committee: That the Board reduce the Core Plus fixed income target allocation to zero, with a range of 0 to 20%, as advanced by the Credit and Risk Mitigation Committee. (Memo dated September 22, 2020)

C. Recommendation as submitted by Alan Bernstein, Chair, Corporate Governance Committee: That the Board approve a consolidated *Corporate Governance and Stewardship Principles* policy.
(Memo dated September 18, 2020)

VIII. REPORTS

A. Evaluating a Climate-Aware Strategic Asset Allocation
Scott Zdrazil, Senior Investment Officer
Dale Johnson, Investment Officer
Sarah Bernstein, Meketa Investment Group
Stephen MacLellan, Meketa Investment Group
(Memo dated September 30, 2020)

B. Strategic Asset Allocation Discussion
Jonathan Grabel, Chief Investment Officer
Jude Perez, Principal Investment Officer
Timothy Filla, Meketa Investment Group
Leandro Festino, Meketa Investment Group
Alina Yuan, Meketa Investment Group
(Memo dated October 5, 2020)

C. 2020 Actuarial Risk Assessment Report
Santos Kreimann, Chief Executive Officer
Ted Granger, Interim Chief Financial Officer
Mark Olleman, Milliman
Nick Collier, Milliman
Craig Glyde, Milliman
(Memo Dated September 10, 2020)

VIII. REPORTS (Continued)

D. Net Alpha Advisors: Report on LACERA Internalization of Investment Management
Ted Wright, Principal Investment Officer
Jude Perez, Principal Investment Officer
Mel Tsao, Senior Investment Analyst
(For Information Only) (Memo dated October 5, 2020)

E. Yankee Bonds and Emerging Market Debt
Vache Mahseredjian, Principal Investment Officer
(For Information Only) (Memo dated September 29, 2020)

F. Council of Institutional Investors Member Ballot
Scott Zdrazil, Senior Investment Officer
(For Information Only) (Memo dated September 25, 2020)

G. Monthly Status Report on Legislation
Barry W. Lew, Legislative Affairs Officer
(For Information Only) (Memo dated September 28, 2020)

H. Monthly Status Report on Board of Investments Legal Projects
Steven P. Rice, Chief Counsel
(For Information Only) (Memo dated October 1, 2020)

I. Monthly Education and Travel Reports for August 2020
Ted Granger, Interim Chief Financial Officer
(For Information Only) (Public Memo dated September 23, 2020)
(Confidential Memo dated September 23, 2020 – Includes Anticipated Travel)

J. September 2020 Fiduciary Counsel Contact and Billing Report
Steven P. Rice, Chief Counsel
(For Information Only) (Privileged and Confidential)
(Attorney-Client Communication/Attorney Work Product)
(Memo dated September 29, 2020)

IX. ITEMS FOR STAFF REVIEW

X. GOOD OF THE ORDER
(For information purposes only)

XI. EXECUTIVE SESSION

A. Conference with Staff and Legal Counsel to Consider the Purchase or Sale of Particular, Specific Pension Fund Investments
(Pursuant to California Government Code Section 54956.81)

1. Centerbridge Capital Partners Fund IV, L.P.
   Christopher Wagner, Principal Investment Officer
   Didier Acevedo, Investment Officer
   Jose Fernandez, StepStone Group
   (Memo dated October 2, 2020)

2. Recommendation to Adjust Emerging Market Debt Investment Vehicles
   Vache Mahseredjian, Principal Investment Officer
   Jeff Jia, Senior Investment Analyst
   (Memo dated September 29, 2020)

3. Hedge Funds Portfolio Discussion
   Vache Mahseredjian, Principal Investment Officer
   Chad Timko, Senior Investment Officer
   Quoc Nguyen, Investment Officer
   (Memo dated September 30, 2020)

4. DIF Infrastructure VI, L.P.
   James Rice, Principal Investment Officer
   Daniel Joye, Investment Officer
   Christopher Slavin, Albourne Partners
   (Memo dated October 1, 2020)

5. Real Estate Manager Selection
   Amit Aggarwal Investment Officer
   Mike Romero Senior Investment Analyst
   Kevin Bassi Senior Investment Analyst
   Rob Kochis, The Townsend Group
   Felix Fels, The Townsend Group
   (Memo dated September 28, 2020)

XII. ADJOURNMENT

Documents subject to public disclosure that relate to an agenda item for an open session of the Board of Investments that are distributed to members of the Board of Investments less than 72 hours prior to the meeting will be available for public inspection at the time they are distributed to a majority of the Board of Investments Members at LACERA's offices at 300 N. Lake Avenue, Suite 820, Pasadena, CA 91101, during normal business hours of 9:00 a.m. to 5:00 p.m. Monday through Friday.

****Requests for reasonable modification or accommodation of the telephone public access and Public Comments procedures stated in this agenda from individuals with disabilities, consistent with the Americans with Disabilities Act of 1990, may call the Board Offices at (626) 564-6000, Ext. 4401/4402 from 8:30 a.m. to 5:00 p.m. Monday through Friday or email PublicComment@lacera.com, but no later than 48 hours prior to the time the meeting is to commence.***

MINUTES OF THE REGULAR MEETING OF THE BOARD OF INVESTMENTS

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

300 N. LAKE AVENUE, PASADENA, CALIFORNIA 91101

9:00 A.M., WEDNESDAY, SEPTEMBER 9, 2020

This meeting was conducted by teleconference under the Governor's Executive Order No. N-29-20.

PRESENT: David Green, Chair

Herman B. Santos, Vice Chair

Wayne Moore, Secretary

Alan Bernstein (Joined the meeting at 9:04 a.m.)

Elizabeth Greenwood (Joined the meeting at 9:50 a.m.)

Shawn Kehoe

Keith Knox

David Muir

Gina V. Sanchez

STAFF ADVISORS AND PARTICIPANTS

Santos H. Kreimann, Chief Executive Officer

Jonathan Grabel, Chief Investment Officer

Steven P. Rice, Chief Counsel

Ted Granger, Interim Chief Financial Officer

Christine Roseland, Senior Staff Counsel

Christopher Wagner, Principal Investment Officer

STAFF ADVISORS AND PARTICIPANTS (Continued)

John McClelland, Principal Investment Officer

Vache Mahseredjian, Principal Investment Officer

Jude Perez, Principal Investment Officer

James Rice, Principal Investment Officer

Esmeralda del Bosque, Senior Investment Officer

Scott Zdrazil, Senior Investment Officer

Chad Timko, Senior Investment Officer

Derek Kong, Senior Investment Officer

Dale Johnson, Investment Officer

Robert Santos, Investment Officer

David Simpson, Investment Officer

Daniel Joye, Investment Officer

Quoc Nguyen, Investment Officer

Trina Sanders, Investment Officer

Michael Romero, Investment Officer

John Kim, Senior Investment Analyst

Mel Tsao, Senior Investment Analyst

Jeff Jia, Senior Investment Analyst

Adam Cheng, Senior Investment Analyst

Barry W. Lew, Legislative Affairs Officer

STAFF ADVISORS AND PARTICIPANT (Continued)

Meketa Investment Group
Stephen McCourt, Managing Principal
Leandro Festino, Managing Principal
Jonathan Camp, Vice President

StepStone Group LP
Jose Fernandez, Partner

Albourne
James Walsh, Head of Portfolio Advisory
Steven Kennedy, Partner
Mark White, Partner
Chris Slavin, Partner

Townsend Group
Rob Kochis, Partner
Felix Fels, Vice President

I. CALL TO ORDER

The meeting was called to order by Chair Green at 9:00 a.m., in the Board Room of Gateway Plaza.

II. APPROVAL OF MINUTES

A. Approval of the Minutes of the Regular Meeting of August 12, 2020

Mr. Santos made a motion, Mr. Knox seconded, to approve the minutes of the regular meeting of August 12, 2020. The motion passed unanimously (roll call) with Messrs. Green, Kehoe, Knox, Moore, Muir, Santos, and Ms. Sanchez voting yes.

III. REPORT ON CLOSED SESSION ITEMS

There was nothing to report.

IV. PUBLIC COMMENT

Daniel Goodmon, Robert Farrell, Michael Guynn and Jan Williams addressed the Board regarding LACERA's exposure to Baldwin Hills Crenshaw Plaza.

Ramsey Jay Jr., Pauline Oghenekohwo, Tina Robinson and Armetha Bravo addressed the Board regarding agenda item VIII. C. James Breedlove, Pauline and Lawrence Oghenekohwo, Mary Calhoun, Barbara Watts, Ametha Bravo and Ramsey Jay, Jr. provided written comments regarding this item as well.

V. CHIEF EXECUTIVE OFFICER'S REPORT
(Memo dated August 19, 2020)

Mr. Kreimann provided a brief presentation on the Chief Executive Officer's Report and answered questions from the Board.

VI. CHIEF INVESTMENT OFFICER'S REPORT
(Presentation dated September 9, 2020)

Mr. Grabel provided a brief presentation on the Chief Investment Officer's Report and answered questions from the Board.

VII. CONSENT ITEM

A. Recommendation as submitted by Scott Zdrazil, Senior Investment Officer: That the Board approve LACERA's member ballot for the annual meeting of the International Corporate Governance Network.
(Memo dated August 31, 2020)

Mr. Bernstein made a motion, Mr. Kehoe seconded, accepting the amendment of Mr. Santos and Ms. Sanchez, that LACERA will vote against all ICGN board nominees, and approve the member ballot on other items. The motion passed (roll call) with Messrs. Bernstein, Green, Kehoe, Knox, Moore, Muir, Santos, and Ms. Sanchez voting yes.

VIII. NON CONSENT ITEMS

A. Recommendation as submitted by Esmeralda del Bosque, Senior Investment Officer, Trina Sanders, Investment Officer, Quoc Nguyen, Investment Officer, John Kim, Senior Investment Analyst and Calvin Chang, Senior Investment Analyst: That the Board approve appointing State Street Bank and Trust Company to provide Real Estate Administration Services. (Memo dated August 31, 2020)

Messrs. Kim, Nguyen, Chang, Ms. Del Bosque and Ms. Sanders provided a presentation and answered questions from the Board.

Mr. Muir made a motion, Mr. Knox seconded, to approve appointing State Street Bank and Trust Company to provide Real Estate Administration Services. The motion passed (roll call) with Messrs. Bernstein, Green, Kehoe, Knox, Moore, Muir, Santos, Ms. Greenwood and Ms. Sanchez voting yes.

B. Recommendation as submitted by Esmeralda del Bosque, Senior Investment Officer, John Kim, Senior Investment Analyst, Adam Cheng, Senior Investment Analyst and Mel Tsao, Senior Investment Analyst: That the Board approve appointing State Street Bank & Trust Company/Solovis to provide Total Fund Performance Measurement Services. (Memo dated August 28, 2020)

Messrs. Kim, Cheng, Tsao and Ms. Del Bosque provided a presentation and answered questions from the Board.

Mr. Santos made a motion, Mr. Muir seconded, to approve appointing State Street Bank & Trust Company/Solovis to provide Total Fund Performance Measurement Services. The motion passed (roll call) with Messrs. Bernstein, Green, Kehoe, Knox, Moore, Muir, Santos, Ms. Greenwood and Ms. Sanchez voting yes.

The following agenda item VIII.C was discussed after agenda item IX.B

VIII. NON CONSENT ITEMS (Continued)

C. Recommendation as submitted by Trustee, Wayne Moore: That the Board adopt the Investment Equity Initiative consistent with BOI's Investment Policy and Principles. (Memo dated August 30, 2020)

Mr. Moore made a motion, Ms. Sanchez, seconded, to adopt the Investment Equity Initiative consistent with BOI's Investment Policy and Principles and provide an implementation road map in 90-days.

Mr. Muir called the question. Mr. Green asked if anyone had an objection with moving forward with Mr. Moore's motion. There were no objections. The Board moved forward with the motion.

The motion passed (roll call) with Messrs. Green, Knox, Moore, Muir, Santos and Ms. Greenwood and Ms. Sanchez voting yes and Messrs. Bernstein and Kehoe abstaining.

IX. REPORTS

A, Strategic Asset Allocation
Stephen McCourt, Meketa Investment Group
Leandro Festino, Meketa Investment Group
Jonathan Camp, Meketa Investment Group
(Presentation dated September 9, 2020)

Mr. Perez and Messrs. McCourt, Festino and Camp of Meketa Investment Group provided a presentation and answered questions from the Board.

B. Diversity, Equity, And Inclusion in LACERA's Investment Program
Jon Grabel, Chief Investment Officer
Steven P. Rice, Chief Counsel
Scott Zdrazil, Senior Investment Officer
Esmeralda Del Bosque, Senior Investment Officer
John Kim, Senior Investment Analyst
(Memo dated August 31, 2020)

IX. REPORTS (Continued)

(Confidential Memo dated August 31, 2020 - Supplemental Summary Report)

Messrs. Grabel, Rice, Zdrazil, Kim and Ms. Del Bosque provided a presentation and answered questions from the Board.

Agenda items IX.A and B will be discussed before agenda item VIII.C

Mr. Santos made a motion, Mr. Bernstein seconded to direct staff to provide a report, including a presentation by JP Morgan, regarding LACERA's Emerging Manager programs in the next 120-days.
The motion passed (roll call) with Messrs. Bernstein, Green, Kehoe, Knox, Moore, Muir, Santos, Ms. Greenwood and Ms. Sanchez voting yes.

C. Performance Review of Real Estate Consultant the Townsend Group
John McClelland, Principal Investment Officer
(For Information Only) (Memo dated August 24, 2020)

This item was received and filed.

D. Consultant Self-Evaluation – Albourne America LLC
Vache Mahseredjian, Principal Investment Officer
James Rice, Principal Investment Officer
Chad Timko, Senior Investment Officer
(For Information Only) (Memo dated August 27, 2020)

This item was received and filed.

E. LACERA Quarterly Performance Book
Meketa Fund Evaluation Report
Jude Perez, Principal Investment Officer
(For Information Only) (Memo dated August 31, 2020)

This item was received and filed.

IX. REPORTS (Continued)

F. OPEB Quarterly Performance Book
Meketa OPEB Fund Evaluation Report
Jude Perez, Principal Investment Officer
(For Information Only) (Memo dated August 31, 2020)

This item was received and filed.

G. Investment Procedures Manual Update – Real Estate and Real Assets
Jude Perez, Principal Investment Officer
(For Information Only) (Memo dated August 26, 2020)

This item was received and filed.

H. Summary of *Alameda* California Supreme Court Decision
Steven P. Rice, Chief Counsel
(For Information Only) (Memo dated August 26, 2020)

This item was received and filed.

I. LACERA Conflict of Interest Code Biennial Update
Jill R. Rawal, Staff Counsel
(For Information Only) (Memo dated August 21, 2020)

This item was received and filed.

J. Form 700 Statement of Economic Interests Training
Jill R. Rawal, Staff Counsel
(For Information Only) (Memo dated August 21, 2020)

This item was received and filed.

K. Monthly Status Report on Legislation
Barry W. Lew, Legislative Affairs Officer
(For Information Only) (Memo dated August 24, 2020)

This item was received and filed.

IX. REPORTS (Continued)

L. Legal Projects Reports
Steven P. Rice, Chief Counsel
(For Information Only) (Memo dated September 1, 2020)

This item was received and filed.

M. Monthly Education and Travel Reports for July 2020
Ted Granger, Interim Chief Financial Officer
(For Information Only) (Public Memo dated August 20, 2020)
(Confidential Memo dated August 20, 2020 – Includes Anticipated Travel)

4th Quarter Education and Travel Expenditure Reports
(Memo dated August 24, 2020)

This item was received and filed.

N. August 2020 Fiduciary Counsel Contact and Billing Report
Steven P. Rice, Chief Counsel
(For Information Only) (Privileged and Confidential)
(Attorney-Client Communication/Attorney Work Product)
(Memo dated August 25, 2020)

This item was received and filed.

X. ITEMS FOR STAFF REVIEW

There were no items for review.

XI. GOOD OF THE ORDER
(For information purposes only)

Mr. Grabel welcomed Investment Analyst, Noah Damsky, to the Real Assets Team.

XII. EXECUTIVE SESSION

A. Conference with Staff and Legal Counsel to Consider the Purchase or Sale of Particular, Specific Pension Fund Investments
(Pursuant to California Government Code Section 54956.81)

1. Manager Termination Recommendation
John McClelland, Principal Investment Officer
(Memo dated August 20, 2020)

Mr. Kochis of the Townsend Group and Mr. McClelland were present and answered questions from the Board. The Board took action. It will be reported out at a future date in accordance with the Brown Act.

2. STG VI, L.P.
Christopher J. Wagner, Principal Investment Officer
Derek Kong, Investment Officer
(Memo dated August 17, 2020)

Messrs. Wagner, Kong and Mr. Fernandez of StepStone Group LP provided a presentation and answered questions from the Board.

Mr. Santos made a motion, seconded by Ms. Greenwood, to approve a commitment of up to $100 million in STG VI, L.P., which is a private equity buyout fund with a value-oriented control strategy focused on middle market investments in enterprise software and software-enabled technology service companies, primarily based in North America and Europe. The motion passed (roll call) with Messrs. Bernstein, Green, Kehoe, Knox, Moore, Santos and Ms. Greenwood and Ms. Sanchez voting yes. Mr. Muir was absent.

3. DWS Pan-European Infrastructure Fund III, L.P.
James Rice, Principal Investment Officer
Daniel Joye, Investment Officer
(Memo dated August 31, 2020)

XII. EXECUTIVE SESSION (Continued)

Messrs. Rice, Mr. Joye and Mr. Walsh of Albourne provided a presentation and answered questions from the Board.

Mr. Santos made a motion, seconded by Ms. Greenwood, to approve a commitment of up to €100 million (approximately $120 million) in DWS Pan-European Infrastructure Fund III, L.P., which is a real assets fund targeting infrastructure, with a specific focus on utilities, renewables, transportation, waste, and energy in Western Europe. The motion passed (roll call) with Messrs. Bernstein, Green, Kehoe, Knox, Moore, Muir, Santos, Ms. Greenwood and Ms. Sanchez voting yes.

4. Grain Spectrum Holdings III, L.P.
   James Rice, Principal Investment Officer
   David Simpson, Investment Officer
   (Memo dated August 31, 2020)

Messrs. Rice, Simpson and Mr. Walsh of Albourne provided a presentation and answered questions from the Board.

Mr. Moore made a motion, seconded by Mr. Knox, to approve a commitment of up $60 million in Grain Spectrum Holdings III, L.P., which is a real assets fund in the telecommunications sector, focusing on spectrum in the United States. The motion passed (roll call) with Messrs. Bernstein, Green, Knox, Moore, Muir, Ms. Greenwood and Ms. Sanchez voting yes; and Mr. Kehoe and Mr. Santos voting no.

B. Conference with Legal Counsel - Anticipated Litigation
   (Significant Exposure to Litigation Pursuant to Paragraph (2) of Subdivision (d) of California Government Code Section 54956.9)

XII. EXECUTIVE SESSION (Continued)

1. Number of Potential Cases: 1

In open session, Chief Counsel corrected that this matter concerns Initiation of Litigation under Government Code Section 54956.9(d)(4).

The Board met with legal counsel to discuss initiation of one piece of potential litigation. Board took action. It will be reported out at a future date, if needed, in accordance with the Brown Act.

XIII. ADJOURNMENT

There being no further business to come before the Board, the meeting was adjourned at 1:30 p.m.

WAYNE MOORE, SECRETARY

DAVID GREEN, CHAIR

September 23, 2020

TO: Each Trustee,
Board of Retirement
Board of Investments

FROM: Santos H. Kreimann SHK
Chief Executive Officer

SUBJECT: **CHIEF EXECUTIVE OFFICER'S REPORT**

I am pleased to present the Chief Executive Officer's Report for September 2020 that highlights a few of the operational activities that have taken place during the past month, key business metrics to monitor how well we are meeting our performance objectives, and an educational calendar.

A Roadmap to Implementing the 100-Day Plan

In May of 2020, we released the "100-Day Management Report to the Trustees of the Board of Retirement and Board of Investments." I would like to take a moment to share with you that we have begun implementation of a number recommendations made in that report. Working with our consultant, KH Consulting Inc., we have developed a LACERA Roadmap for Implementing Action Steps in the 100-Day Management Plan" (a copy of the Roadmap is attached to this report). This is a working document that lays out the steps we will take, based on the 100-Day Plan, and defines accountability for the action steps and a timeline for completing the steps.

During the months of September and October we are conducting meetings with the management and supervisory teams throughout LACERA to discuss the roadmap and responsibilities for the management teams. These discussions are important to help make sure that the management team has a solid understanding of the plan and the steps needed for completion. Additionally, it helps everyone understand who is responsible for moving these steps forward and who will be needed to support these efforts. We have made these action steps part of the annual evaluation process for the management team responsible for completing the steps to ensure goal alignment throughout the organization.

COVID-19 Remote Teleworking Update

We are pleased to report that we have gone 30 days without any operationally impacting COVID-19 incidents. With Los Angeles County continuing to report a high number of new cases, we feel this critical milestone is largely due to our remote teleworking policy and adherence to the

COVID-19 Organizational protocols, and our efforts to keep as many staff members as possible working remotely. Over the last three weeks we have averaged about 71% of our staff working off-site. Our Remote Call Center operations and the Virtual Member Service Center continue to provide our members with the services they need.

We continue to look for opportunities to provide enhanced tools for our staff to serve members. During the last month we completed the rollout of e-fax, replacing the need to have staff in the office physically processing incoming and outgoing fax requests. Not only does this help address our business continuity planning, but in the future it will save LACERA money as we look at phasing out fax machines. We are also rolling out the ability for LACERA staff members to make outbound calls using Microsoft Teams. This will reduce the need for issuing cell phones or using personal phone lines to conduct business. Finally, we are working with Disability Retirement Services to utilize our remote call center system to improve their ability to answer more detailed member questions that our Member Services Call Center cannot answer. These and other improvements are consistently being made to make LACERA more efficient both during the pandemic and after.

Maintaining safe and secure systems while working remotely continues to be of paramount importance to the organization and our members. As such, our Acting IT manager, Interim Chief Information Security Officer, and IT Consultant, Transquest, will be making a closed session presentation at the Operations Oversight Committee (OOC) meeting detailing our efforts thus far to safeguard our member's data and secure our systems as staff process work in a remote environment.

Update on our Phased Return to Work

The Los Angeles County CEO Office of Emergency Management (OEM) worked with seven workgroups and several department heads throughout the County to create a framework for County departments to eventually re-open facilities to the public when it is safe to do so. This framework was issued by the Board of Supervisors in June of 2020 with the direction to County departments to draft a "reconstitution" plan and submit it to the OEM for evaluation. The framework focused on four main themes, Staffing and Safety, Facility Adjustments, Training & Support, and Messaging and Communication.

While LACERA is not a County department, we were invited to share our Phased Return to Work Plan (presented to the Board of Retirement in June of 2020) for review against the County's framework. Recognizing the value of input from a "fresh set of eyes," and wanting to take advantage of the work completed by the County, we submitted our plan. On September 3, 2020, the OEM notified LACERA they had reviewed our plan and determined that we addressed all the major themes and they had no major recommendations. A subsequent call with the OEM to discuss in more detail what they thought about the plan confirmed they thought we had done a good job. OEM made a few suggestions on how we could make it even better, such as explaining terminology or providing pictures in the plan of some of the physical modifications we have made. Those recommendations have been addressed in the attached Addendum to the plan. I would like to recognize our Business Continuity Team - Roberta Van Nortrick, James Beasley, Lilit Bagdzhyan, and Dean Inouye, as well as everyone they have worked with, for their efforts to prepare us for a successful and safe return to the office.

We continue to review and modify the plan to make sure it fits our needs as we plan to re-open when it is safe to do so. We announced at the September Board of Retirement meeting that we had completed almost all of our physical modifications to prepare to re-open the Member Service Center. During that meeting Mr. Kehoe requested LACERA ensure that members can bring their spouse or a family member to an in person meeting. We would like to confirm the plan as presented to the Trustees in June does allow for a member to bring an additional person to their one-on-one counseling session. Additionally, our virtual counseling sessions can accommodate multiple participants if requested.

Since our September meeting we have reviewed and documented the physical modification needs for our Financial Accounting Services Division and begun the process of making those modifications. We have also worked with Disability Litigation to document their plans for hearings that comply with their Appeals process.

Finally, we are working with our Communications team to develop an improved internal communication plan to help all staff members stay current on our plans and have access to information resources they need for the duration of the pandemic. The Communications team had previously created an intern COVID-19 News section on our Intranet. We continue to update that page with relevant information ranging from incident reports to health and well-being information.

Disability Retirement Services Going Digital

One of our long standing goals to improve our Disability Retirement Services (DRS) operations has been to move to digitizing records received during the evaluation process. DRS orders hundreds of pages of medical and personnel records to help our investigators and panel physicians develop the recommendations submitted to the Boards. These records have, for the most part, always been in paper format.

Digitizing these records is critical to our business continuity plans and one of the important preparation steps we need to take to focus on improving our management of the process using a case management system. Digitizing these records ensures that staff members can securely and safely view and work with these documents while working remotely. Additionally, it reduces physical storage space requirements and will lead to an improvement of the security for these records.

Effective October 1, 2020, DRS will no longer order physical copies of records – they will all be retrieved digitally. In time, we will develop plans for digitizing the existing active case records. I want to thank Ms. Contreras and her team, Elsy Gutierrez and her DPC team, and our Systems Division for helping us reach this important milestone.

SHK: jp
CEO Report September 2020.doc

Attachments

Los Angeles County Employees Retirement Association (LACERA)

Roadmap for Implementing Action Steps in the 100-Day Management Report

Updated: 8/20/2020

Focus		Action Steps	Accountability: Lead	Accountability: Support	Timeline FY2020-21: Jul	Aug	Sep	Q2	Q3	Q4	FY2021-22	FY2022-23	Percent Completed
		CHAPTER II - UPDATE ON ACTIONS TAKEN											
		Strategic Planning & Action Plans											
SP	II.1	Report review with Trustees	CEO	Trustees									75%
SP	II.2	Refined “Next Action Steps”	CEO	Execs									75%
SP	II.3	Strategic planning effort	CEO	Trustees, Execs									
SP	II.4	Strategic Plan actions defined	CEO	Execs									
		COVID-19 Transition Plan											
C19	II.5	After action reviews	CEO	Execs	M	M	M	M	M	M	TBD based on		20%
C19	II.6	COVID-19 Transition Plan	CEO, AEO/Ops	IT, Admin, HR	Starting with Member Services								25%
C19	II.7	Plans to address the work backlog:	AEO/Ops	Mem Group									
C19	II.7a	-- Retiree Disability (moving to paperless)	AEO/Ops	Mgr/Disab	Slight delays in third-parties providing documentation								90%
C19	II.7b	-- Member Services (heavily "real time")	AEO/Ops	Mgr/Mem									75%
C19	II.7c	-- Benefit Services (rules, resources, tech)	AEO/Ops	Mgr/Benefits, IT	Heavy backlog pre-/post-COVID-19								
C19	II.7c1	. "Quick fix" Benefits backlog plan	Mgr/Benefits	Legal, IT									
C19	II.7c2	. Longer term Benefits backlog plan (self-service)	Mgr/Benefits	IT, PMG									
		Business Continuity Planning (BCP)											
SP	II.8	Unified BCP	AEO/Ops	Admin., HR									60%
IT	II.9	BCP/DRP initiatives implementation for IT	IT Exec		See Chapter V								
		Management of Staff Working Remotely											
Culture	II.10	Remote staff management	Execs	HR Dir									10%
		CHAPTER III - NEW ORGANIZATIONAL ALIGNMENT											
Org	III.1	Structural review with both Boards	CEO	Trustees									100%
Org	III.2	Staff announcement of new structure	CEO	Execs		MAC							20%
Org	III.3	Routine executive meetings	CEO	Execs									100%
Org	III.4	Member-facing functional alignment	AEO/Ops	Mem Ops									50%
Org	III.5	New COO position	CEO	HR Dir									
Org	III.6	CFO position redefined & filled	CEO	HR Dir									
Org	III.7	CI&TO position defined; recruitment begun	CEO	HR Dir									
Org	III.8	Compliance Officer position filled	Chief Counsel	HR Dir									25%
Org	III.9	PIO position filled	CEO	HR Dir									5%
Org	III.10	Organizational refinements if any	CEO	Execs									
Org	III.11	Job titles/org hierarchy consistency	HR Dir										

Focus		Action Steps	Accountability Lead	Accountability Support	FY2020-21 Jul	FY2020-21 Aug	FY2020-21 Sep	FY2020-21 Q2	FY2020-21 Q3	FY2020-21 Q4	FY2021-22	FY2022-23	Percent Completed
		CHAPTER IV - PLANNING											
SP	IV.1	Best practices identified for Strategic Plan	Execs	Mgrs						See also VII.4			
SP	IV.2	Shared vision & strategic planning	CEO	Trustees				See Chapter II on Update					0%
SP	IV.3	Unified BCP	Admin Services	IT	See Chapter II on Update								60%
SP	IV.4	IT plans (strategy, security BCP, DRP)	IT	ITMC	See Chapter V on IT Modernization								
SP	IV.5	HR Plans	HR Dir	Execs									
SP	IV.6	Improved budgeting process	CFO, Admin		See also VII.1 on budgeting								5%
SP	IV.7	Communications Plan	Comm	Mem Ops, RHC, IT							Ongoing	Ongoing	
SP	IV.8	Linkage of plans to Strategic Plan	Execs										
		CHAPTER V - IT MODERNIZATION											
		IT Planning, Structure, & Staffing											
IT-Org	V.1	IT Management Council established	IT Exec	CEO, Execs					Meets quarterly thereafter				
IT-Org	V.2	Priority IT plans developed & implemented	IT Exec	IT Tean									
IT-Org	V.3	Priority IT policies & IT developed	IT Exec	ITMC					Ongonig				
		-- PMO											40%
		-- IT Operations											15%
IT-Org	V.4	IT Strategic Plan developed & aligned	IT Exec	ITMC									
IT-Org	V.5	IT Program Management Office established	CEO	CTO, AEO/Admin									100%
IT-Org	V.6	IT/IS structure realigned	CEO, CTO	AEO/Admin									
IT-Org	V.7	IT staffing plan implemented	IT Exec	HR Dir									
		IT Security											
IT-Security	V.8	Immediate IT vulnerabilities addressed	IT Exec	IT Sec Consultant									20%
IT-Security	V.9	Security expert consultant study completed	CEO	IT Exec									70%
IT-Security	V.10	Security study recommendations adopted	IT Exec	ITMC									
		IT Investment											
IT-Invest	V.11	IT recommended investments	CTO, AEO/Admin	ITMC									
IT-Invest	V.12	IT Modernization/IT Strategic Plan adopted	IT Exec	Trustees									
IT-Invest	V.13	IT capabilities/systems upgrade investments	Trustees, IT Exec	ITMC									
IT-Imple		**IT Implementation**											
IT-Imple	V.14	IT "quick fixes" implemented	CTO, AEO/Admin										
IT-Imple	V.15	IT Strategic Plan/other IT plans implemented	CTO, AEO/Admin										
IT-Imple	V.16	Robust telecommuting capabilities	CTO, AEO/Admin	IT Exec									80%
IT-Imple	V.17	Migration to the cloud (vendor resources)	CTO, AEO/Admin	CIO									5%
IT-Imple	V.18	Migration to the cloud (servers & systems)	IT Exec										
IT-Imple	V.19	Virtual call center, including counseling	AEO/Ops, IT	Mem Group									100%
IT-Imple	V.20	Remote work capability for benefits analysts	IT										100%

Focus		Action Steps	Accountability		FY2020-21						FY2021-22	FY2022-23	Percent Completed
			Lead	Support	Jul	Aug	Sep	Q2	Q3	Q4			
		CHAPTER VI - WORK CULTURE & CHANGE MANAGEMENT											
Culture	VI.1	Leadership & management dev program	CEO	HR Dir									
Culture	VI.2	Diversity/Inclusion Plan (culture/values)	CEO	Execs, HR Dir									50%
Culture	VI.3	Shortened technical training	QA	Mem Group					Prepare			Monitor	
Culture	VI.4	Levels of Protection defined & implemented	Chief Counsel	Compliance Officer									20%
		CHAPTER VII - ENHANCED PROCESSES & OPERATIONS											
Improve	VII.1	New budget system and processes	Admin Services	CFO	Build on existing "Great Plains" platform								5%
Improve	VII.1	Division staffing & metrics in budget	CEO/COO	Mgrs/Mem Ops				Draft Budget				Ongoing	
Improve	VII.2	Continuous process improvement initiative	AEO/Mem Serv	PMG							Ongoing	Ongoing	
Improve	VII.3	Metrics & priority processes to improve	PMG	Mgrs/Mem Ops							Annual	Annual	25%
Improve	VII.4	Best practices & best-in-class standard	Execs	Mgrs/Mem Ops							See also IV.1		
Improve	VII.5	Process inventory/priorities approved	Execs	AEO/Ops, PMG							Annual	Annual	
Improve	VII.6	Process improvement with metrics	PMG	Mgrs/Mem Ops							Ongoing	Ongoing	
Improve	VII.7	Potential expansion of PMG's services	CEO	Execs									

Addendum to
LACERA'S PHASED TRANSITION PLAN
SEPTEMBER 16, 2020

This Addendum includes information to be added to LACERA's Phased Return to Work Plan that was submitted to Los Angeles County's Reconstitution Team (Team.) This information is organized according to the four main thematic areas established by the Team.

Staffing & Safety

Red/Blue/Purple/Black Rotating Teams Schedule

This team concept was established to minimize the risk that all Staff Members assigned to a specific work unit might be exposed to the virus, thus causing the entire unit to self-quarantine affecting the completion of daily tasks performed by that unit.

To insure that LACERA practiced social distancing for the protection of our staff, we implemented this rotating team schedule. Each staff member is assigned to a team based on the physical location of their workspace, if they are in the high-risk group, or if their job duties require them to be onsite daily. The Blue and Red teams were composed after considering the location of the staffs' worksite and separated those in the area on the different teams to assure social distancing. Those who in the high-risk group or have childcare issues are on the Purple team and they do not rotate into the office but work 100 percent from home. Those on the Black team are in the office every day due to the need for them to be there to complete their job duties.

The staff are assigned to one of these teams:

- Blue – staff without any restrictions
- Red – staff without any restrictions
- Purple – staff who are high risk or have childcare issues
- Black – staff whose job requires them to be onsite at LACERA daily

The Red and Blue team members alternate weeks for coming into the office. So, in any given month, the Blue team will be in the office for weeks 1 and 3 and the Red team will be in the office for weeks 2 and 4. This does not necessarily mean that these staff are required to be in the office for the entire week that they are "in the office" but if they need to come into the office, they may only do so during their assigned week. This allows us to practice social distancing and to alleviate any exposure to the entire team.

Sample Work Schedule for Team Rotations

Division Teleworking Teams
Effective September 8, 2020

Staff Member Work Day/Schedule

Black Team*
Asst. Manager - Monday
Manager Monday – Friday
Supervisor - Wednesday
Supervisor - Tuesday (Thursday, as needed)

Blue Team
Staff 1 - Tuesday
Staff 2 - Friday
Staff 3 - Tuesday and Thursday
Staff 4 - Friday
Staff 5 - Wednesday

Red Team
Staff 6 - Monday – Friday
Staff 7 - Tuesday and Thursday
Staff 8 - Wednesday
Staff 9 - Tuesday, Thursday, and Friday

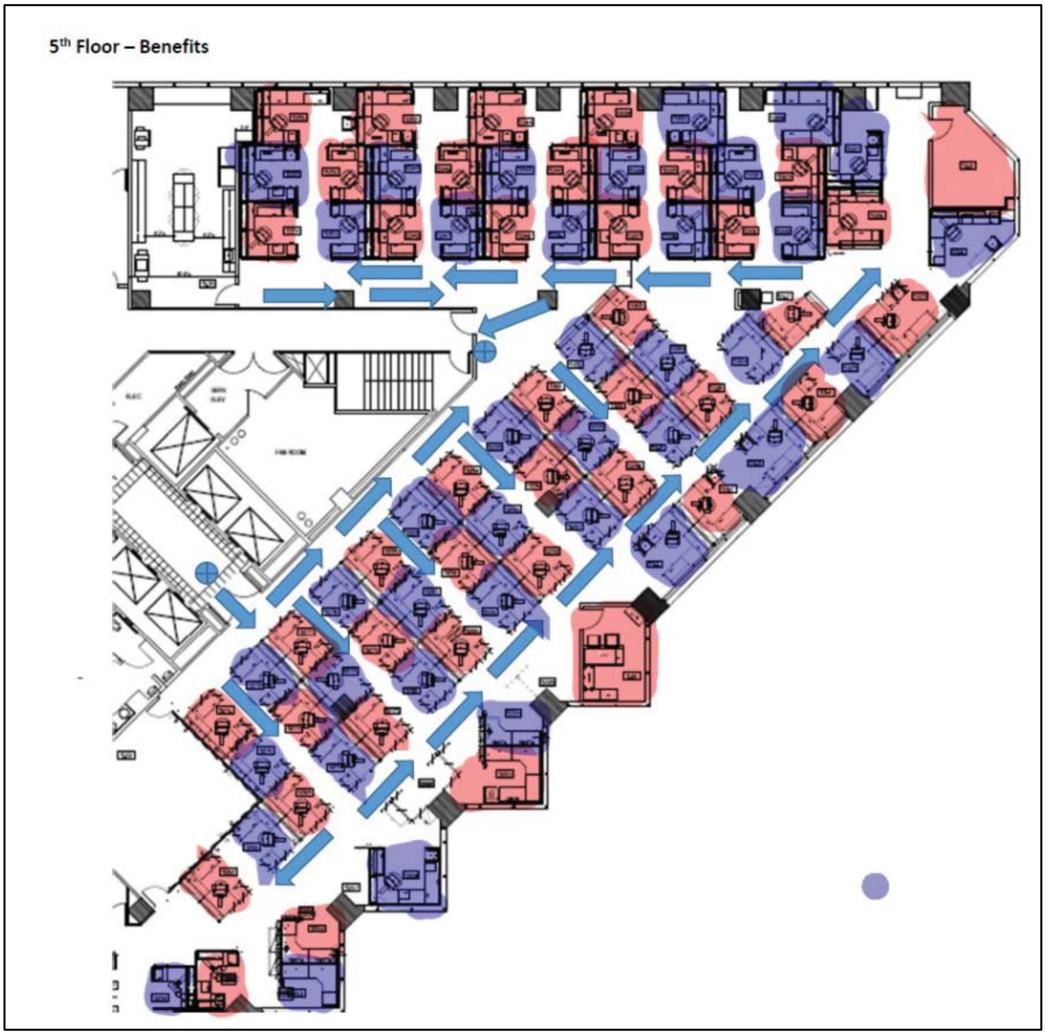
*****Black Team Members are in the Office every week.

NOTE: Unless otherwise noted, staff members come into the office as indicated during their assigned week only unless other arrangements have been made and prior approval has been given/obtained.

<u>Facility Adjustments</u>

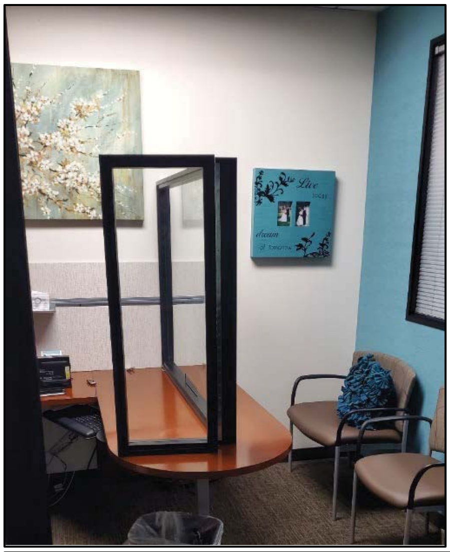
Habitable Space -
LACERA's Safety Officer visited each LACERA Division and measured the space between staffs working spaces. This measurement was recorded on a map for each Division, noting those workspaces that required any modifications to the workspace to adhere to the social distancing guidelines and to be used when establishing the rotating teams to also assure that staff sitting close to each other would be on different rotating teams to assure social distancing.

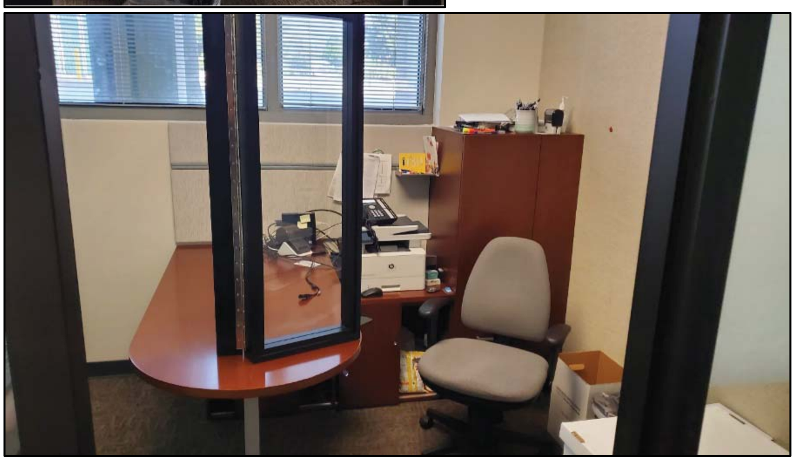
Here is actual habitable space map for one particular LACERA Division

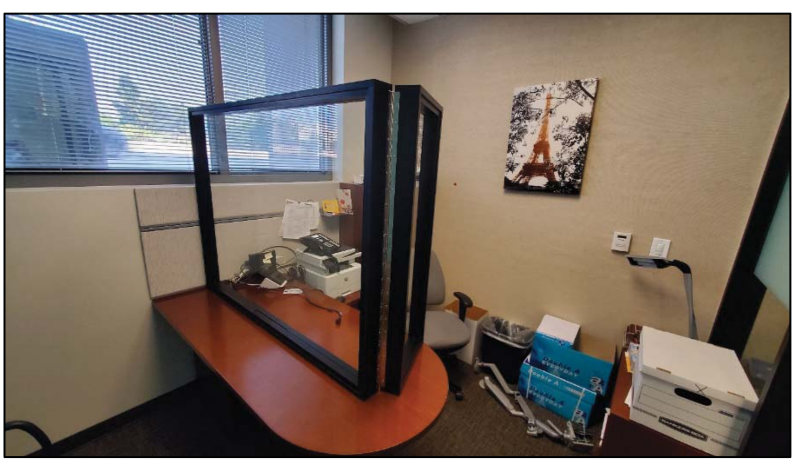


Office Divider Installation -
We installed glass dividers in our Member Service Center offices where LACERA Staff meet with our Members for face-to-face discussions. We decided on glass rather than plexiglass as it is more durable, longer- lasting, and easier to clean.

Here are pictures of the glass dividers that have been installed.



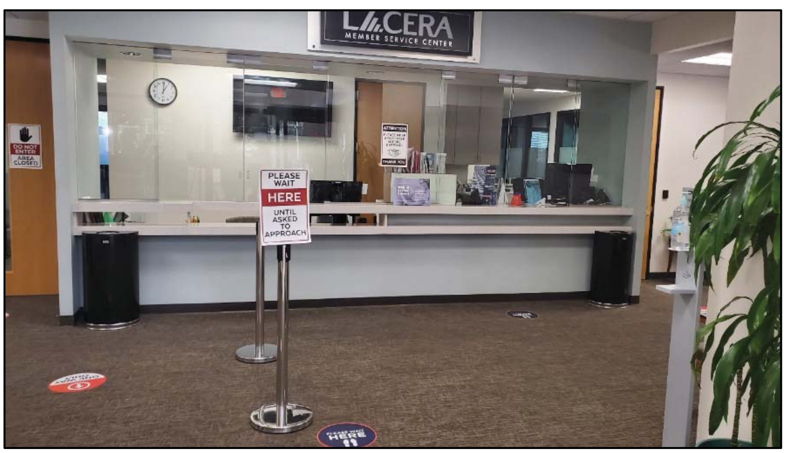


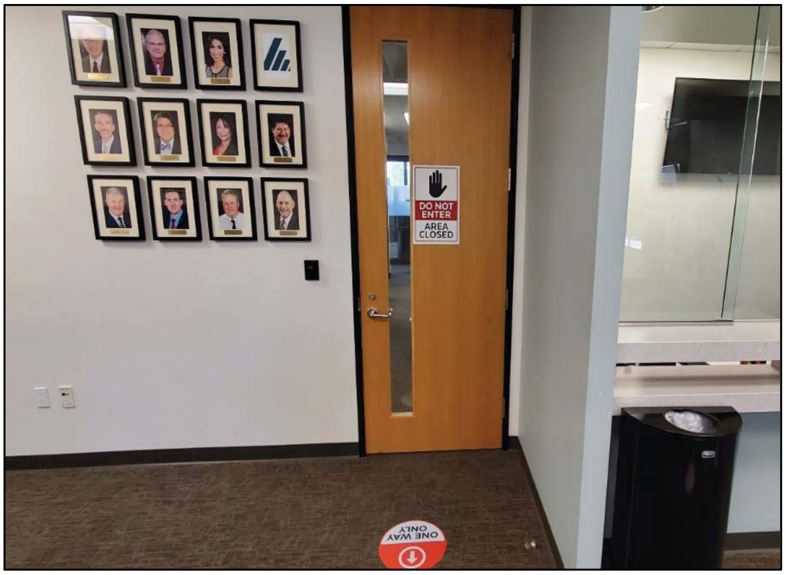


We have also added signage in the Member Service Center Lobby, Reception area, and throughout the Office space where LACERA Staff meet with LACERA Members. This includes directional markings on the floors to control traffic. There are separate entrance and exit doors established.


ATTENTION
PLEASE WEAR A FACE MASK BEFORE ENTERING
THANK YOU
Jump to the front of the line!


DO NOT USE DESK
DO NOT USE DESK


LACERA
MEMBER SERVICE CENTER
DO NOT ENTER AREA CLOSED
PLEASE WAIT HERE UNTIL ASKED TO APPROACH

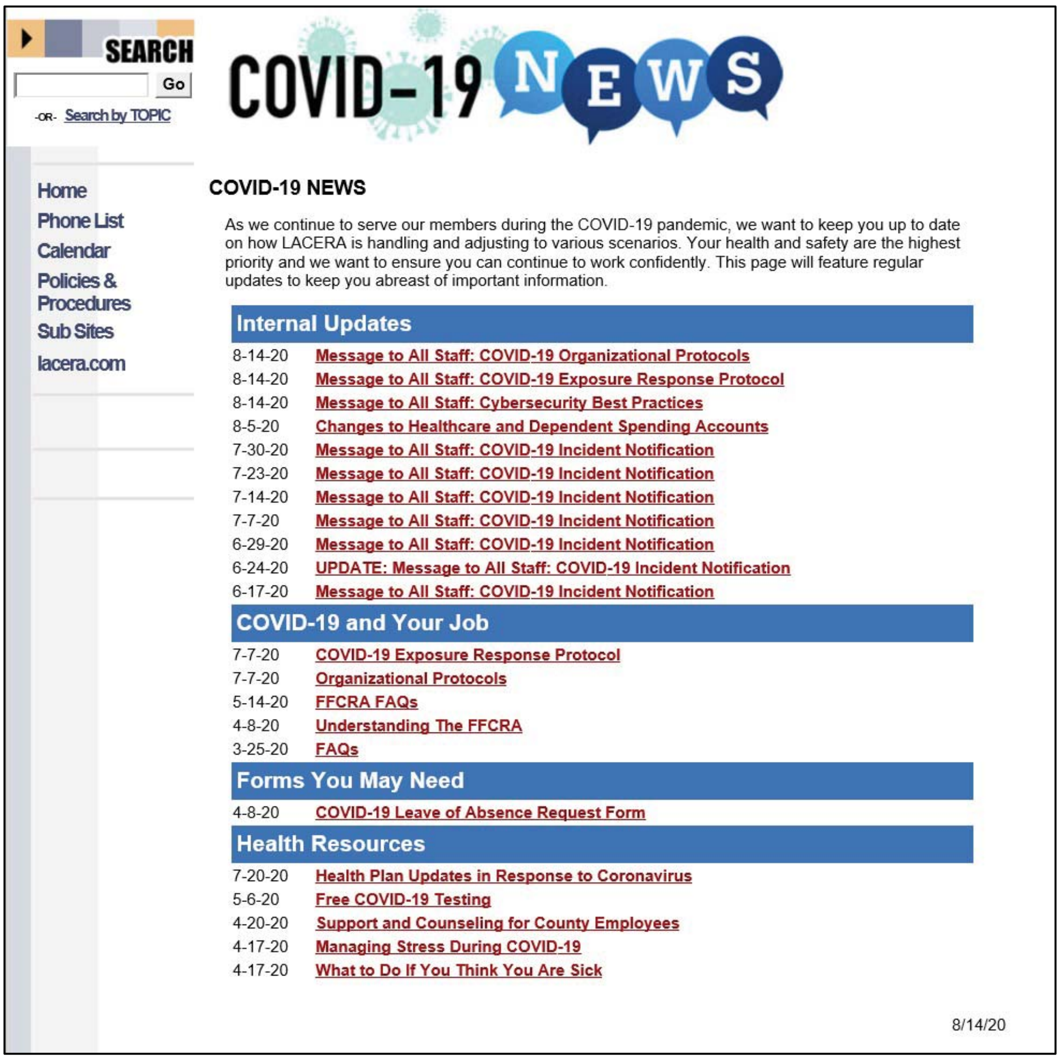


Training & Support
Nothing to add.

<u>Messaging & Communication</u>

LACERA has established an Intranet page for LACERA Staff to access for the most current information. This page is used to house any communication to Staff regarding COVID-19, including policies, procedures, and protocols and all past and present messages to Staff.

LACERA Intranet Page



SEARCH

Go

-OR- Search by TOPIC

Home
Phone List
Calendar
Policies & Procedures
Sub Sites
lacera.com

COVID-19 NEWS

COVID-19 NEWS

As we continue to serve our members during the COVID-19 pandemic, we want to keep you up to date on how LACERA is handling and adjusting to various scenarios. Your health and safety are the highest priority and we want to ensure you can continue to work confidently. This page will feature regular updates to keep you abreast of important information.

Internal Updates

8-14-20	Message to All Staff: COVID-19 Organizational Protocols
8-14-20	Message to All Staff: COVID-19 Exposure Response Protocol
8-14-20	Message to All Staff: Cybersecurity Best Practices
8-5-20	Changes to Healthcare and Dependent Spending Accounts
7-30-20	Message to All Staff: COVID-19 Incident Notification
7-23-20	Message to All Staff: COVID-19 Incident Notification
7-14-20	Message to All Staff: COVID-19 Incident Notification
7-7-20	Message to All Staff: COVID-19 Incident Notification
6-29-20	Message to All Staff: COVID-19 Incident Notification
6-24-20	UPDATE: Message to All Staff: COVID-19 Incident Notification
6-17-20	Message to All Staff: COVID-19 Incident Notification

COVID-19 and Your Job

7-7-20	COVID-19 Exposure Response Protocol
7-7-20	Organizational Protocols
5-14-20	FFCRA FAQs
4-8-20	Understanding The FFCRA
3-25-20	FAQs

Forms You May Need

4-8-20	COVID-19 Leave of Absence Request Form

Health Resources

7-20-20	Health Plan Updates in Response to Coronavirus
5-6-20	Free COVID-19 Testing
4-20-20	Support and Counseling for County Employees
4-17-20	Managing Stress During COVID-19
4-17-20	What to Do If You Think You Are Sick

8/14/20

LACERA website LACERA.com

, COVID-19 NEWS AND RESO... ×

About LACERA | Benefits | Healthcare | Investments | Communications | Opportunities

Search

Search by Topic

Brochures & Forms

HOME

ACERA News
OVID-19 News and esources
bout My LACERA
AQs
AQs - General nformation
inks
ontact Us
und Performance

my LACERA

Register or Sign In

LACERA Home Page > COVID-19 News and Resources

COVID-19 NEWS AND RESOURCES

Dear members: We understand that this is a time of great uncertainty. Please be assured that LACERA's essential operations are continuing and your benefits will not be impacted by the Coronavirus pandemic. Check this special resources section regularly, as we will be providing updates as this situation evolves.

LACERA Updates

8-26-20	CEO Update: Ongoing LACERA Elections, Future Plans for Member Services
8-12-20	CEO Reminder: Virtual Member Services Center and My LACERA
7-2-20	CEO Reminder: My LACERA Document Upload and Other Services
6-12-20	CEO Update: Virtual Member Service Center
5-29-20	CEO Update: Normalization of Services and Planning for an Uncertain Future
5-21-20	CEO Update: Contribution Rate Changes & Upcoming Board Elections
5-13-20	CEO Update: Remote Call Center & Pre-Retirement Webinars
5-6-20	CEO Update: Remote Call Center and Member Participation in Board Meetings
4-29-20	CEO Update on RHC, Investments and Upcoming Board Elections
4-29-20	Healthcare Plans and COVID-19
4-22-20	CEO Update on Operations and Services
4-15-20	COVID-19 and the Safety of LACERA Benefits
4-8-20	LACERA's Investment Strength During Market Volatility
3-31-20	LACERA-Administered Retiree Healthcare Benefits
3-20-20	COVID-19 and Estate Planning: LACERA Special Durable Power of Attorney
3-20-20	Attention Retired Members Receiving Mailed Checks
3-16-20	Notice of LACERA Actions Regarding Coronavirus (COVID-19)

County Information

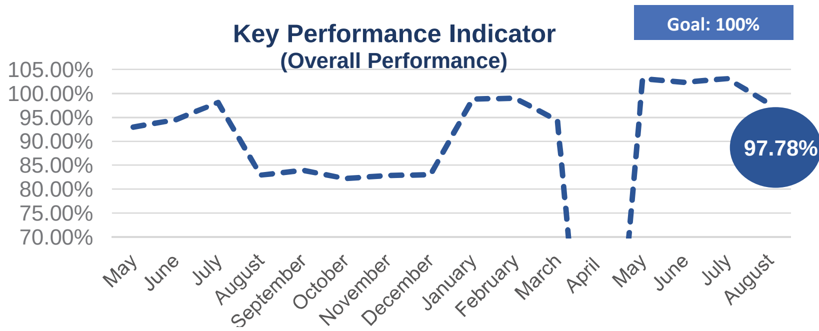
8-14-20	LA County Rent Relief Program
8-5-20	Changes to Healthcare and Dependent Spending Accounts
4-20-20	L.A. County Disaster Help Center
4-15-20	How to Receive Your Stimulus Check If You Haven't Filed Taxes
4-15-20	LA County CEO Update on Safer at Home and Work Requirements
4-8-20	LA County WDACS Launches Free Delivery Service For Older Adults
4-3-20	Use Face Coverings to Reduce the Spread of COVID-19
4-3-20	Families First Coronavirus Response Act
3-31-20	County Services for Caring for Seniors
3-16-20	Confronting COVID-19: L.A. County Responds

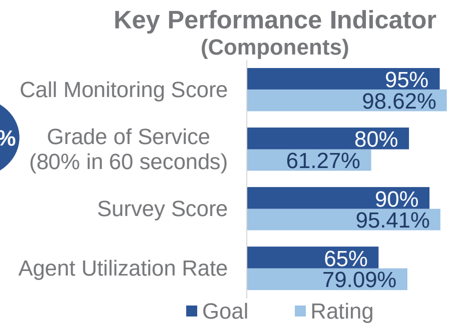
Striving for Excellence in Service

Service Metrics Reported on a Fiscal Year Basis (July 1) Through: August 2020

Outreach Attendance	Outreach Events	Outreach Satisfaction	Member Service Center	Member Services Calls
1,704	**11**	**N/A**	**N/A**	**11,966**
3,852 Year-to-Date	22 Year-to-Date	Change Since Last Mo	- Change Since Last Mo	12,190 3 Mo. Avg.

Member Services





Top Calls

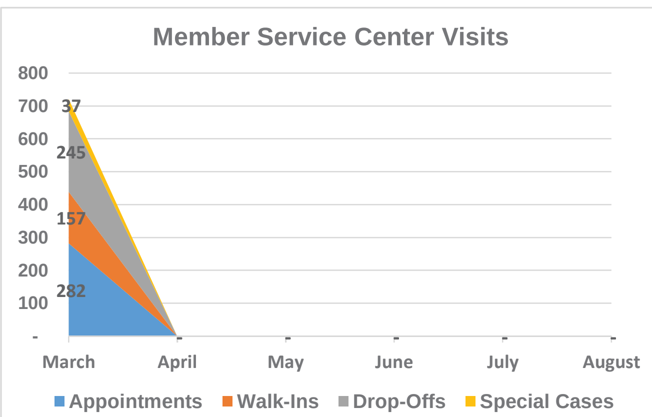
1. Retirement Counseling: Overview
2. Retirement Counseling: Estimate
3. MyLACERA Login Issues

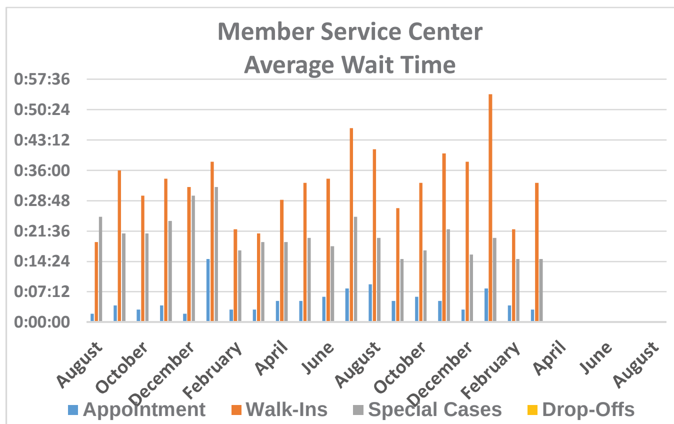
Emails 535

24:00 hours

Avg. Response Time (ART)

Secure Messages 715





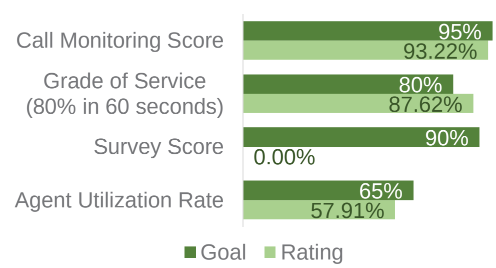
*Drop Off Wait Time: No Waiting

Retiree Healthcare

Total RHC Calls: 5,128

Top Calls

1. Medical-Enrollment/Change/Cancel
2. Medical Benefits
3. Medicare Part B Reimbursement



Emails 289

1 Day

Avg. Response Time (ART)

Secure Messages

163

Striving for Excellence in Service (Continued)

Disability

Applications

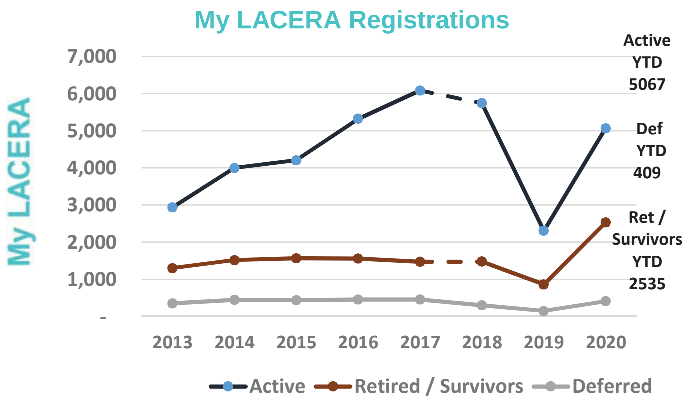
650
In Process As Of: 8/31/2020

634	Pending on: 7/31/2020
65	Received
99	Year-to-Date
0	Re-Opened
0	Year-to-Date
47	To Board - Initial
86	Year-to-Date
2	Closed
6	Year-to-Date

Appeals

97
In Process As Of: 8/31/2020

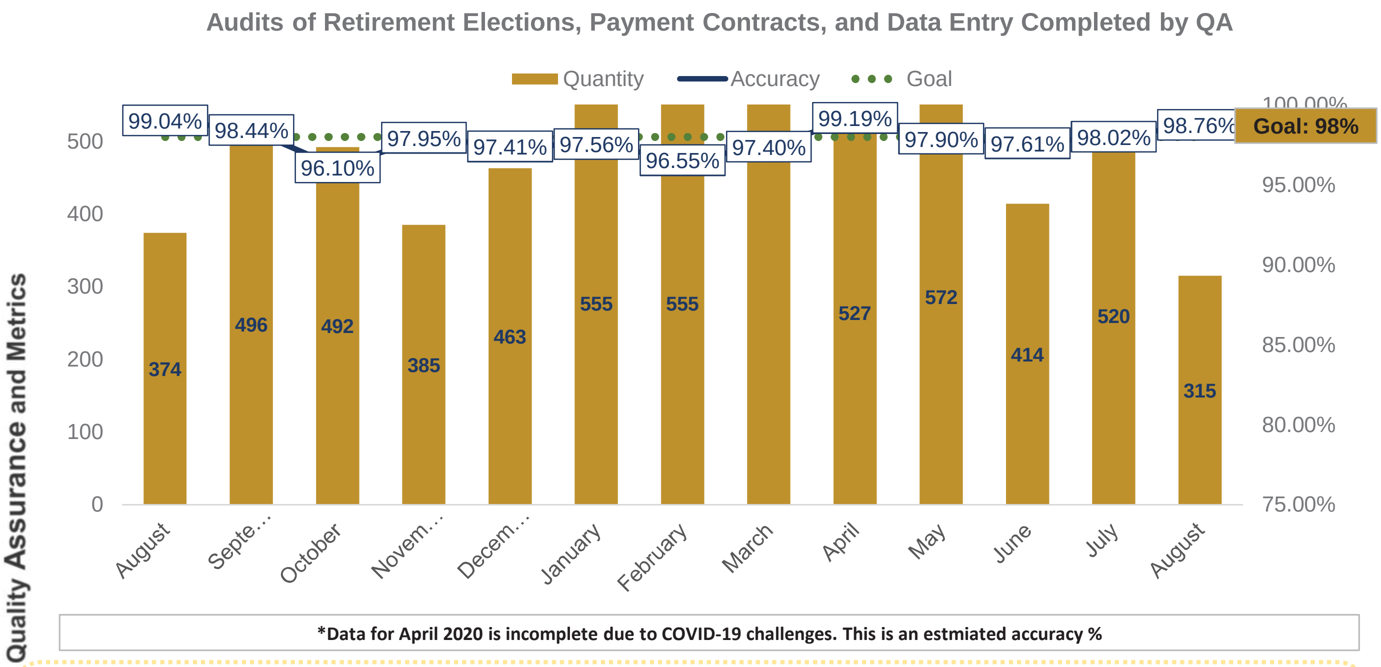
99	Pending on: 7/31/2020
1	Received
3	Year-to-Date
3	Admin Closed/Rule 32
5	Year-to-Date
0	Referee Recommended
0	Year-to-Date
0	Revised/Reconsidered for Granting
0	Year-to-Date



COVID-19 NOTE

Some Member Services, Retiree Healthcare, and Quality Assurance statistics for April were not available due to COVID-19 impacts. Where possible we have provided estimates based on manual reporting or in some cases a six month average for survey scores.

Striving for Excellence in Quality

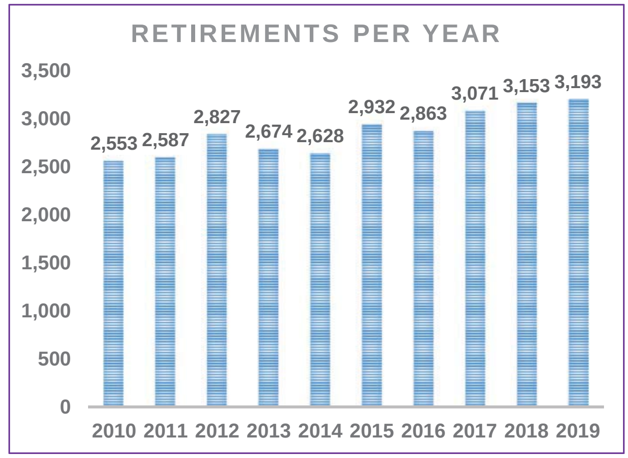


August
98.76%

Retirement Elections		Payment Contracts		Data Entry	
231	Samples	24	Samples	60	Samples
96.78%	Accuracy	100.00%	Accuracy	99.50%	Accuracy

Member Snapshot

	Plan	Active	Retired	Survivors	Total
	Members as of 09/15/2020				
General	Plan A	90	15,746	4,358	**20,194**
General	Plan B	20	679	70	**769**
General	Plan C	31	425	69	**525**
General	Plan D	39,823	17,056	1,575	**58,454**
General	Plan E	16,196	13,704	1,286	**31,186**
General	Plan G	30,528	64	6	**30,598**
General	**Total General**	**86,688**	**47,674**	**7,364**	**141,726**
Safety	Plan A	2	5,027	1,613	**6,642**
Safety	Plan B	9,145	6,443	315	**15,903**
Safety	Plan C	4,148	10	0	**4,158**
Safety	**Total Safety**	**13,295**	**11,480**	**1,928**	**26,703**
TOTAL MEMBERS		**99,983**	**59,154**	**9,292**	**168,429**
% by Category		**59%**	**35%**	**6%**	**100%**



Average Monthly Benefit Allowance Distribution September 2020

	General	Safety	Total	%
$0 to $3,999	29,833	1,840	31,673	53.81%
$4,000 to $7,999	12,898	3,502	16,400	27.86%
$8,000 to $11,999	3,375	4,150	7,525	12.79%
$12,000 to $15,999	931	1,510	2,441	4.15%
$16,000 to $19,999	294	276	570	0.97%
$20,000 to $23,999	83	106	189	0.32%
$24,000 to $27,999	27	18	45	0.08%
> $28,000	12	3	15	0.03%
Totals	**47,453**	**11,405**	**58,858**	**100%**

Average Monthly Benefit Allowance:	**$**	**4,451.00**

Healthcare Program

(YTD as of 08/31/20)

	Employer	Member
Medical	95.2	7.4
Dental	7.6	742,438
Part B	12.4	0
Total	**115.2**	**8.2**

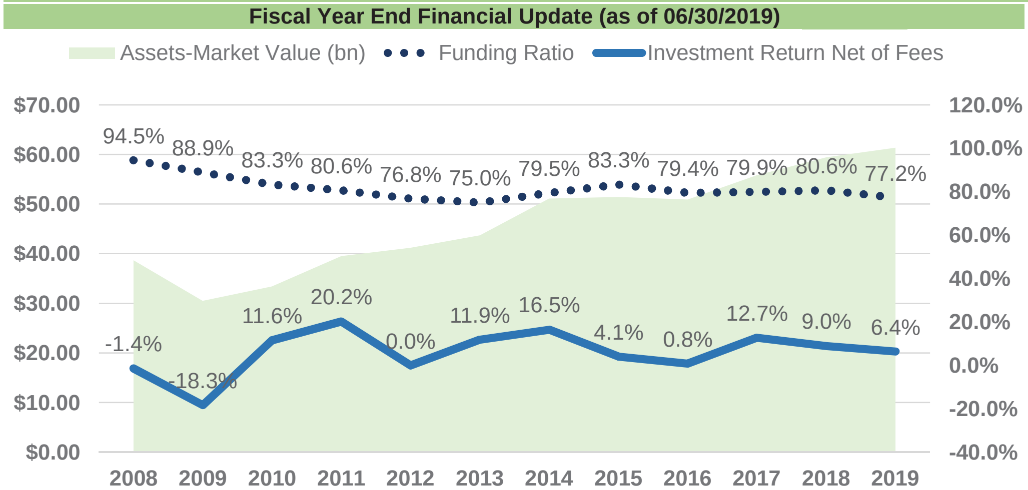
Healthcare Enrollments

(Mo. Ending: 08/31/20)

Medical	52,350
Dental	53,710
Part B	35,558
LTC	605
Total	**142,223**

Key Financial Metrics

Fiscal Year End Financial Update (as of 06/30/2019)



Funding Metrics
(as of 6/30/19)

Employer NC	10.86%
UAAL	13.92%
Assumed Rate	7.00%
Star Reserve	$614m
Total Assets	$58.3b

Contributions
(as of 6/30/19)

	Employer	Member
Annual Add	$1.7b	$635.4m
% of Payroll	22.59%	7.68%

TOTAL FUND RETURN

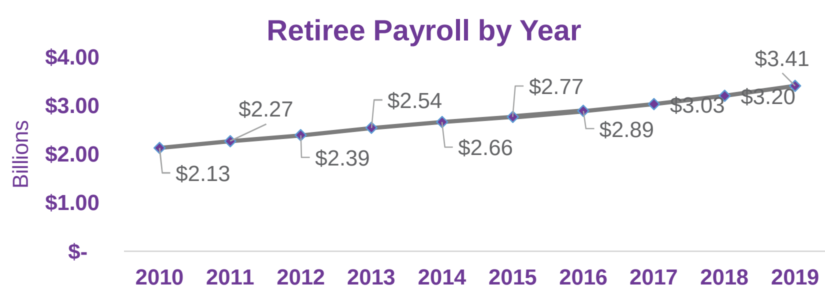
(Net of Fees)

5 YR: 6.5% **10 YR:** 9.1%

Retired Members Payroll

(As of 8/31/2020)

Monthly Payroll	$314.9m
Payroll YTD	$.6b
New Retired Payees Added	304
Seamless %	95.07%
New Seamless Payees Added	575
Seamless YTD	95.13%
By Check %	2.00%
By Direct Deposit %	98.00%



Date	Conference
October, 2020	
23	CALAPRS (California Association of Public Retirement Systems) Round Table – Trustees DoubleTree Hotel San Jose *RESCHEDULED TO VIRTUAL CONFERENCE*
November, 2020	
10-13	SACRS Indian Wells, CA *RESCHEDULED TO VIRTUAL CONFERENCE*
11-12	Institutional Limited Partners Association (ILPA) General Partner Summit New York, NY *CANCELLED – VIRTUAL CONFERENCE NOVEMBER 10-12, 2020*
12-14	Harvard Business School-Audit Committees in a New Era of Governance Boston, MA *CANCELLED* *AUDIT COMMITTEES-VIRTUAL NOVEMBER 12-14, 2020*
15-18	IFEBP (International Foundation of Employment Benefit Plans) Annual Employee Benefits Conference Honolulu, HI *CANCELLED* *U.S. ANNUAL VIRTUAL CONFERENCE, NOVEMBER 3-19, 2020*
16-20	Investment Strategies & Portfolio Management *(prev. Pension Fund & Investment Mgmt.)* Wharton School, University of Pennsylvania *LIVE VIRTUAL*
DUE TO COVID-19, SCHEDULED EVENTS FOR 2021 ARE SUBJECT TO CHANGE	
January, 2021	
24-26	NCPERS (National Conference on Public Employee Retirement Systems) Legislative Conference Washington D.C.
February, 2021	
17-19	Pacific Pension Institute (PPI) North American Winter Roundtable Vancouver, Canada
March, 2021	
6-9	CALAPRS (California Association of Public Retirement Systems) General Assembly Meeting Monterey, CA
8-10	Council of Institutional Investors (CII) Spring Conference Washington D.C.
25-26	PREA (Pension Real Estate Association) Spring Conference Seattle, WA
31-April 2	CALAPRS (California Association of Public Retirement Systems) Advanced Principles of Pension Management for Trustees at UCLA Los Angeles, CA

Effective September 29, 2020

Chief Investment Officer Monthly Report

Board of Investments

October 14, 2020

Jonathan Grabel
Chief Investment Officer

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

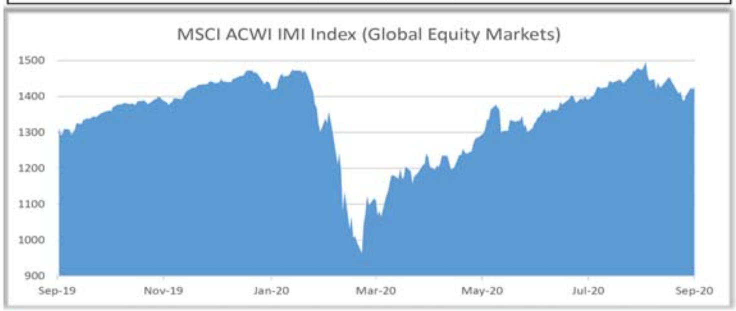
Table of Contents

Market Environment

Global Market Performance as of September 30, 2020

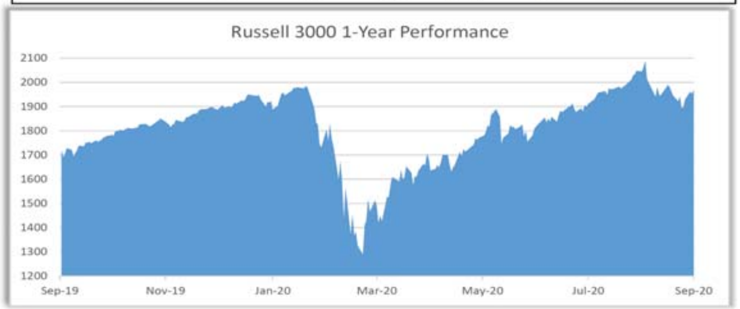
MSCI ACWI Index (Global Equity Market)*

Trailing Returns (%)			Annualized Returns (%)			
1-month	3-month	YTD	1Y	3Y	5Y	10Y
-3.1	8.1	0.5	9.6	6.5	10.0	8.5



Russell 3000 Index (U.S. Equity Market)

Trailing Returns (%)			Annualized Returns (%)			
1-month	3-month	YTD	1Y	3Y	5Y	10Y
-3.6	9.2	5.4	15.0	11.7	13.7	13.5

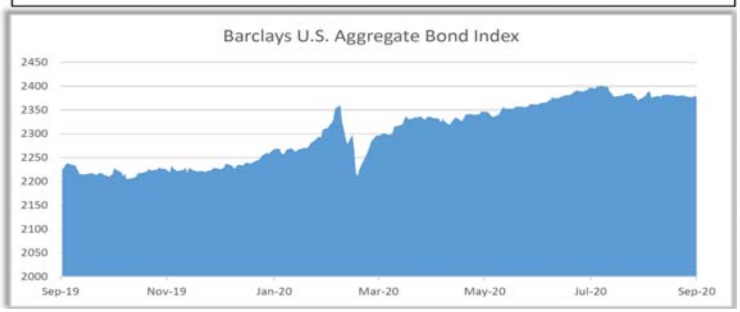


MSCI Emerging Market Index

Trailing Returns (%)			Annualized Returns (%)			
1-month	3-month	YTD	1Y	3Y	5Y	10Y
-1.6	9.6	-1.2	10.5	2.4	9.0	2.5

Barclays U.S. Aggregate Bond Index**

Trailing Returns (%)			Annualized Returns (%)			
1-month	3-month	YTD	1Y	3Y	5Y	10Y
-0.1	0.6	6.8	7.0	5.2	4.2	3.6



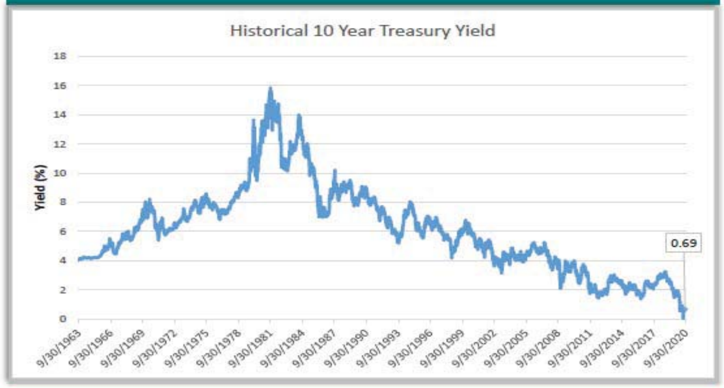
*Global Equity Policy Benchmark - MSCI ACWI IMI Index
**Investment Grade Bonds Policy Benchmark - Barclays U.S. Aggregate Bond Index

Source: Bloomberg

Key Macro Indicators*

GDP Growth of Major Economies[1]

Historical Low for 10-Year Treasury Yield[2]



World Equity Valuation[3]

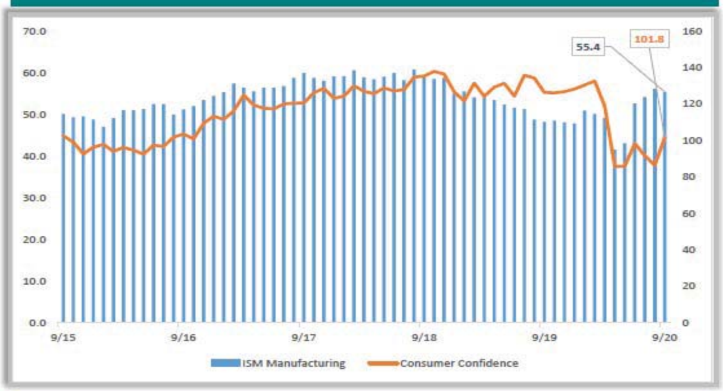
Central Bank Rates[4]
(as of 9/30/2020)

*The information on the "Key Macro Indicators" charts is the best available data as of 9/30/20 and may not reflect the current market and economic environment.

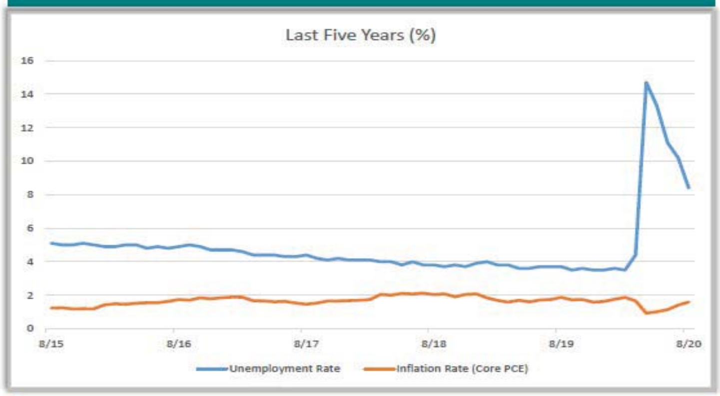
Sources: 1. Bloomberg
2. St. Louis Federal Reserve
3. FactSet
4. FactSet

Key Macro Indicators*

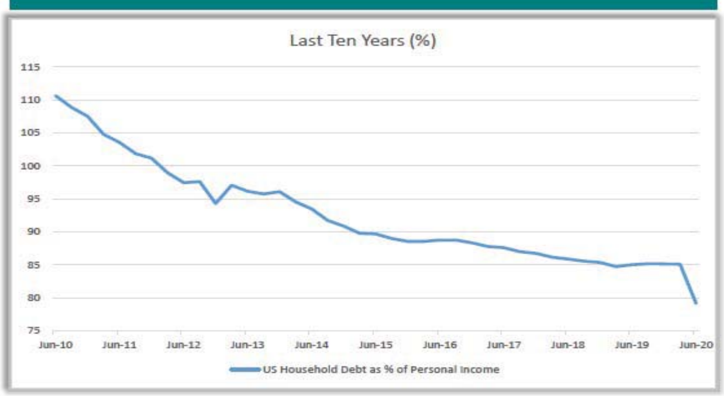
Consumer Confidence & ISM Manufacturing[1]



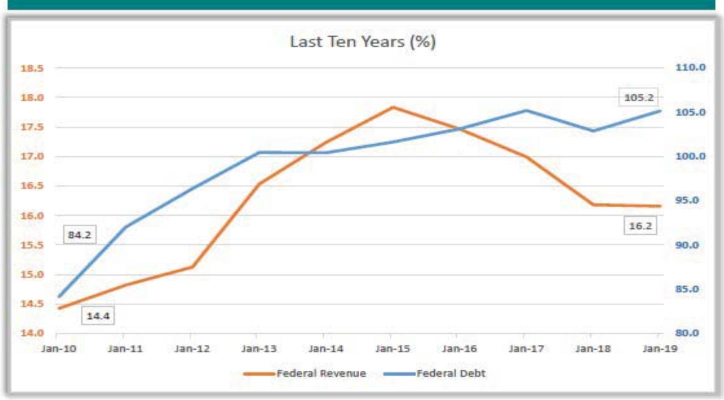
U.S. Inflation & Unemployment[2]



US Household Debt as % of Personal Income[3]



Federal Revenue and Federal Debt as % of GDP[4]



*The information on the "Key Macro Indicators" charts is the best available data as of 9/30/20 and may not reflect the current market and economic environment

Sources: 1. Bloomberg 2. Bloomberg 3. Bloomberg 4. Bloomberg & Federal Reserve

Market Themes and Notable Items to Watch

Recent Themes

- COVID-19
  - More than 34 million cases and 1 million deaths worldwide
    - Over 7 million cases in the U.S.
    - Over 11 million cases in Brazil and India
  - 7-day moving average of daily cases in the U.S. rose to over 42,000 on September 30th from recent low of approximately 34,000 registered during the month
- The Fed left interest rates unchanged and is expected keep interest rates near zero through 2023, perhaps longer
- U.S. Dollar climbed higher after hitting a 2-year low in August
- September Effect
  - Historically, the most disappointing calendar month for the U.S. stock market
  - September marked the first losing month since the COVID recovery rally in late March partly due to a tech-led correction
    - Dow -2.3%, S&P 500 -3.9%, NASDAQ -5.2%

What to Watch

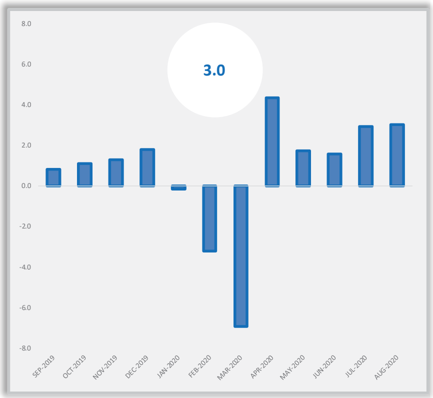
- COVID-19
  - Global spread
  - Treatment developments
  - Lasting economic impact
- Social and civil rights initiatives
- Fiscal stimulus
- Unemployment and consumer spending
- Health of corporate balance sheets and credit availability
- Real estate mortgage defaults
- 2020 U.S. elections and political dynamics
  - U.S. Presidential campaigns are set to take center-stage
- Geopolitical risks and trade arrangements

*Sources: Johns Hopkins University, Centers for Disease Control and Prevention, Reuters

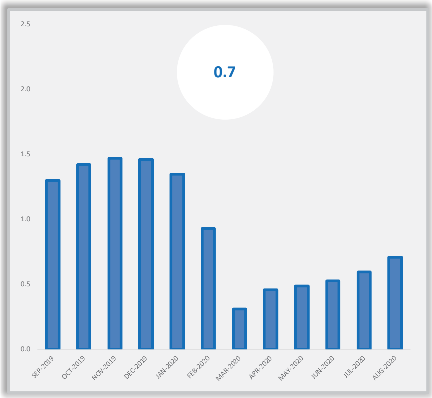
Portfolio Performance Update

Total Fund Summary as of August 2020

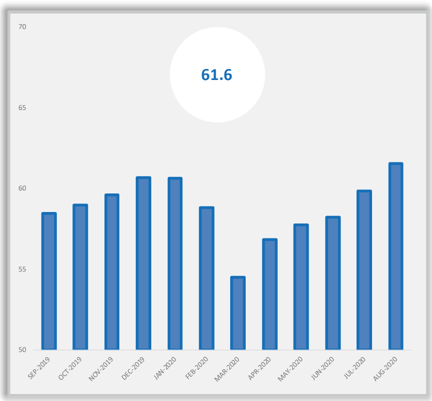
Monthly Return
(% net)



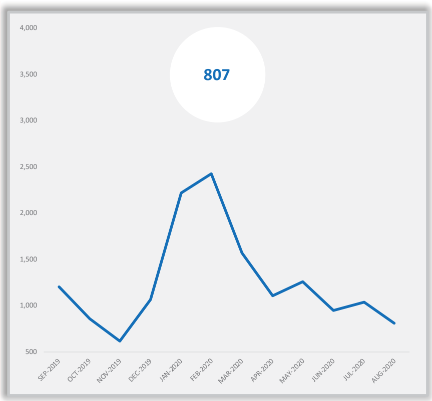
Sharpe Ratio
(3-Year Annualized)



Total Market Value
($ billions)

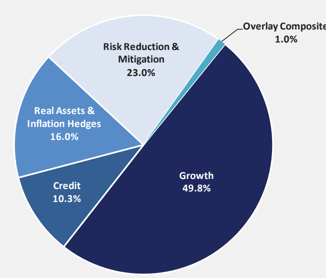


Cash
($ millions)



Asset Allocation

	Market Value[1] ($ millions)	% of Total	Final Target[2]
TOTAL FUND	**61,565**	**100.0%**	
Growth	**30,629**	**49.8%**	**47.0%**
Global Equity	22,917	37.2%	35.0%
Private Equity[3]	7,024	11.4%	10.0%
Opportunistic Real Estate[4]	688	1.1%	2.0%
Credit	**6,367**	**10.3%**	**12.0%**
High Yield	2,014	3.3%	3.0%
Bank Loans	2,335	3.8%	4.0%
Emerging Market Debt	840	1.4%	2.0%
Illiquid Credit[3,4,5]	1,176	1.9%	3.0%
Real Assets & Inflation Hedges	**9,831**	**16.0%**	**17.0%**
Core & Value Added Real Estate[4]	4,688	7.6%	7.0%
Natural Resources & Commodities	2,299	3.7%	4.0%
Infrastructure	1,721	2.8%	3.0%
Treasury Inflation-Protected Securities	1,122	1.8%	3.0%
Risk Reduction & Mitigation	**14,131**	**23.0%**	**24.0%**
Investment Grade Bonds	11,375	18.5%	19.0%
Diversified Hedge Fund Portfolio[5]	1,949	3.2%	4.0%
Cash	807	1.3%	1.0%
Overlay Composite[6]	606	1.0%	—



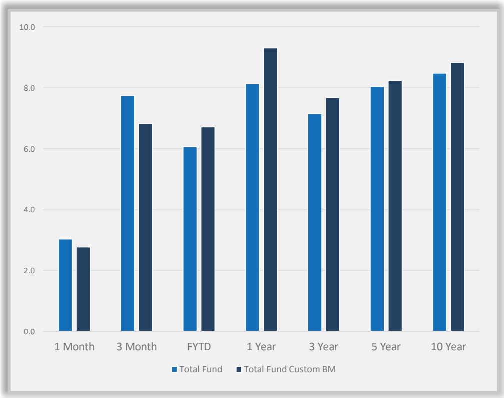
1. Transition balances are included in each subcategory total, if applicable
2. Final target weights effective as of 10/1/19
3. Private Equity market values reflect latest available and are adjusted for cash flows
4. Real Estate market values reflect a 3-month lag and best available values
5. Hedge Fund market values reflect a 1-month lag
6. Reflects net cash position for overlay investing

Historical Net Performance as of August 2020*

LACERA Pension Fund
(net)

	Market Value ($ millions)	% of Total Fund	Final Target[1]	1 Month	3 Month	FYTD	1 Year	3 Year	5 Year	10 Year
TOTAL FUND	**61,565**	**100.0%**	**100.0%**	**3.0**	**7.7**	**6.1**	**8.1**	**7.2**	**8.0**	**8.5**
Total Fund Custom BM				*2.8*	*6.8*	*6.7*	*9.3*	*7.7*	*8.3*	*8.8*
7% Annual Hurdle Rate				*0.57*	*1.71*	*1.13*	*7.00*	*7.00*	*7.00*	*7.00*
Functional Composites[2]				**1 Month**	**3 Month**	**FYTD**	**1 Year**			
GROWTH	**30,629**	**49.8%**	**47.0%**	**5.7**	**12.2**	**9.6**	**13.0**			
Growth Custom BM				*5.5*	*11.4*	*12.1*	*14.2*			
CREDIT	**6,367**	**10.3%**	**12.0%**	**1.2**	**7.1**	**4.7**	**1.2**			
Credit Custom BM				*1.2*	*5.1*	*3.8*	*5.2*			
REAL ASSETS & INFLATION HEDGES	**9,831**	**16.0%**	**17.0%**	**1.3**	**3.4**	**3.5**	**-0.5**			
Real Assets & Inflation Hedges Custom BM				*1.1*	*3.6*	*3.0*	*1.9*			
RISK REDUCTION & MITIGATION	**14,131**	**23.0%**	**24.0%**	**-0.4**	**2.3**	**1.4**	**6.4**			
Risk Reduction & Mitigation Custom BM				*-0.6*	*1.2*	*0.6*	*5.8*			
OVERLAY COMPOSITE	**606**	**1.0%**	—							

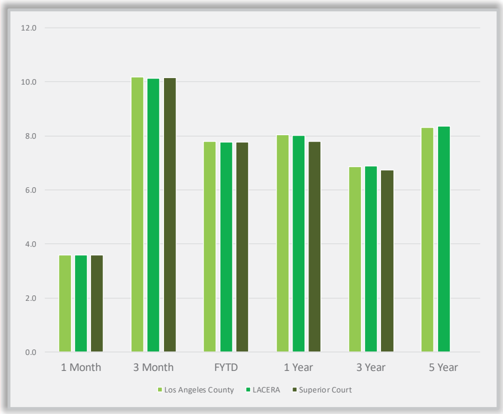
Historical Returns
(net)



OPEB Master Trust Fund
(net)

Sub-Trusts	Market Value ($ millions)[3]	Trust Ownership %	Final Target	1 Month	3 Month	FYTD	1 Year	3 Year	5 Year
TOTAL OPEB MASTER TRUST	**1,609**								
Los Angeles County	1,554	96.6%	—	3.6	10.2	7.8	8.0	6.9	8.3
LACERA	6	0.4%	—	3.6	10.1	7.8	8.0	6.9	8.3
Superior Court	49	3.0%	—	3.6	10.2	7.8	7.8	6.7	—
Functional Composites				**1 Month**	**3 Month**	**FYTD**	**1 Year**	**3 Year**	
OPEB Growth	**842**	**52.4%**	**50.0%**	**6.1**	**15.2**	**11.6**	**15.8**	**8.7**	
Custom OPEB MT Growth Pool				*6.1*	*15.1*	*11.6*	*15.4*	*8.4*	
OPEB Credit	**306**	**19.0%**	**20.0%**	**0.8**	**4.5**	**3.8**	**1.7**	**—**	
Custom OPEB MT Credit Pool				*1.0*	*5.0*	*4.0*	*2.2*	*—*	
OPEB Real Assets & Inflation Hedges	**309**	**19.2%**	**20.0%**	**2.1**	**7.5**	**5.7**	**-6.4**	**—**	
Custom OPEB MT RA & IH Pool				*2.0*	*7.4*	*5.6*	*-6.8*	*—*	
OPEB Risk Reduction & Mitigation	**151**	**9.4%**	**10.0%**	**-0.7**	**1.1**	**0.6**	**5.6**	**5.5**	
Custom OPEB MT RR & M Pool				*-0.6*	*1.1*	*0.6*	*5.5*	*5.2*	
Operating Cash	**0.2**	**0.0%**	—						

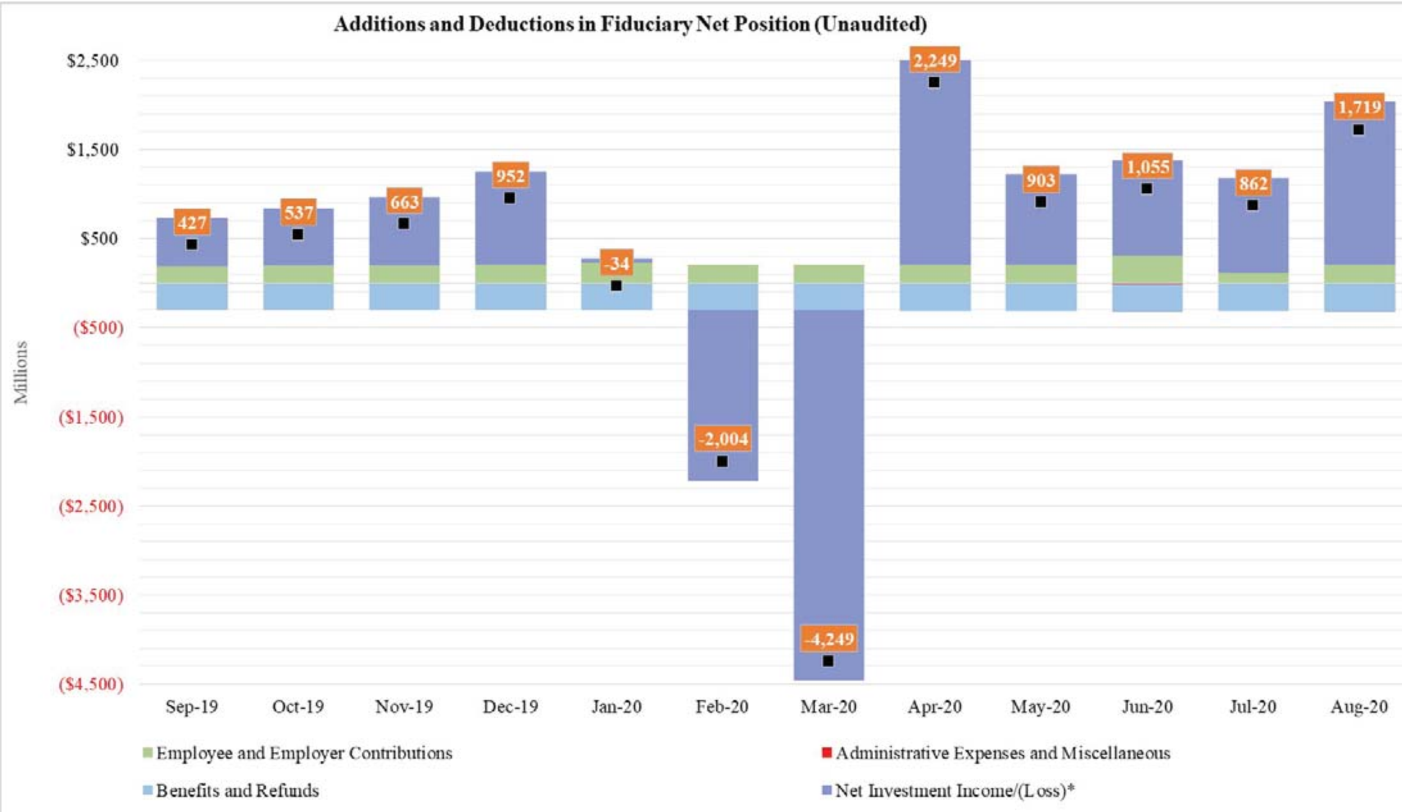
Historical Returns
(net)



1. Final target weights effective as of 10/1/19
2. Functional composites were adopted on 4/1/19
3. Market value differences between the sub-trusts and functional composites are due to operational cash

* Historical real estate valuations are currently under review, therefore August 2020 total fund, composite, and benchmark returns are preliminary

Change In Fiduciary Net Position



*Includes both unrealized and realized net investment income

Fiscal Year	Negative Months	Positive Months	Total Net Position Change $
FY-19	4	8	$1.9 billion
FY-20	5	7	-
FY-21	0	2	$2.6 billion

Portfolio Structural Updates

Portfolio Structural Updates

Portfolio Movements

Rebalancing Activity

From		To
$42 million Cash	→	Credit
$10 million Cash	→	Real Estate
$215 million Public Equity	→	Cash
$32 million Hedge Funds	→	Cash

Hedges and Overlays

Program	August Return	August Gain/Loss	Inception* Gain/Loss
Currency Hedge**	-0.6%	-$45.5 Million	$1.0 Billion
Cash/Rebalance Overlay***	1.5%	$19.5 Million	$31.6 Million

Current Search Activity

Status of Active Searches – Subject to Change

Name	RFP Issued	Due Diligence	BOI Review
Hedge Funds Emerging Manager Program Separate Account Manager	●	●	Anticipated Late 2020
High Yield Fixed Income Investment Management Services	●	●	Anticipated Late 2020
Transition Management Services	●	●	Anticipated Late 2020
Dedicated Managed Account Services	●	●	Anticipated Early 2021
Real Estate Consultant Services	●	●	Anticipated Early 2021

Quiet Period for Search Respondents

Please see the Appendix for this month's list of respondents to active searches

*Currency and overlay program inception dates are 8/2010 & 7/2019, respectively

** LACERA's currency hedge program's 1-month return is calculated monthly whereas the monthly gain/loss amount for the same period is the net realized dollar amount at contract settlement over three monthly tranches

*** LACERA's overlay program's 1-month return includes interest earned on the cash that supports the futures contracts

Key Initiatives and Operational Updates

Notable Initiatives and Operational Updates

Key Initiative Updates

- Onboarding process of new risk and performance system continues
- Ongoing development of T.I.D.E. initiative
- Continuous improvements to the business continuity plan
- Investments working on internal audit requests for external

Operational Updates

- Investments formed a “Back To Office” working group to develop plans to return to the office
- Financial Analyst II & III searches
    - Public Equity, Real Assets and Portfolio Analytics (Corporate Governance)
- Investments working with FASD on reviewing final drafts of the CAFR
- Investments formed an Operational Due Diligence (“ODD”) Group to standardize and enhance ODD across the total Fund
- Investments working on requests from external auditor
- Investments has started preparing the annual AB2833 report

Manager/Consultant Updates

- The fund manager, Mr. Ali Nassiri of the Prologis European Logistics Fund has left the firm to pursue other interests. The portfolio manager, Ms. Anoaneta Todorova who has been with Prologis since 2012, has been named the successor fund manager. Staff is comfortable with the change and will continue to monitor the situation.
- The StepStone Group Inc. went public on September 16, 2020 and began trading on the Nasdaq Global Select Market under the ticker symbol “STEP.”

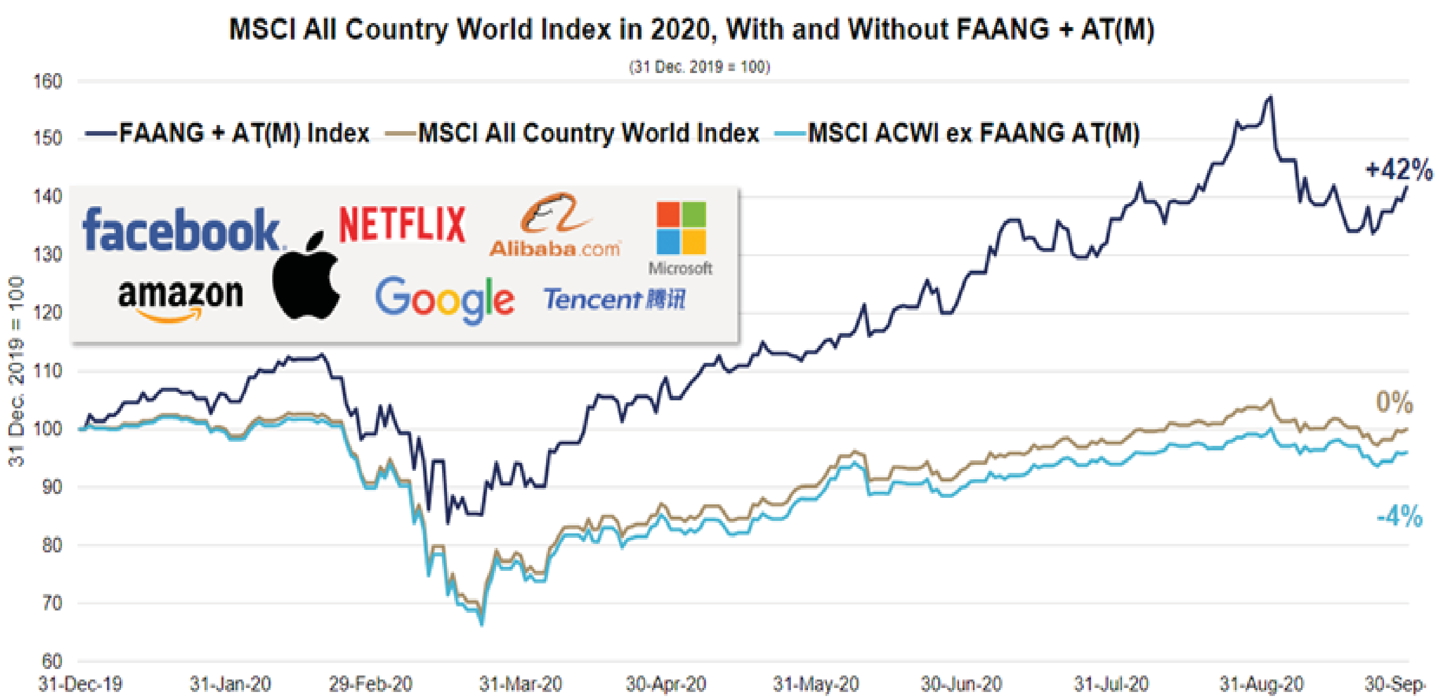
Commentary

Staff Charts of the Month*

Performance of Equity Indices Driven by Large Tech

Heavyweight Tech Giants – FAANG + AT(M) – Drive Equity Markets

THESE EIGHT FIRMS – SHOWN BELOW – HAVE A MARKET CAP EQUAL TO 12% OF THE GLOBAL TOTAL

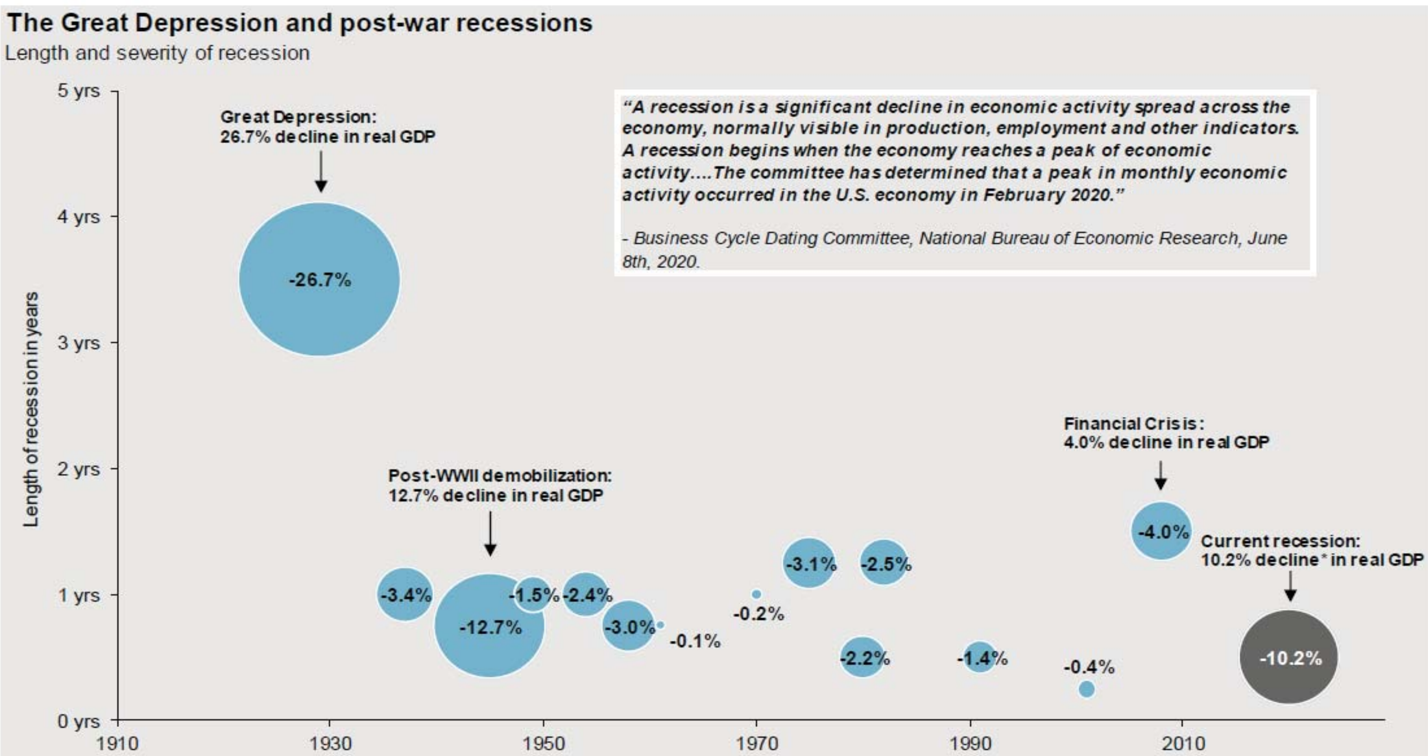


Source: LaSalle, Bloomberg. Data to 30 September 2020

* Submitted by the real estate team

Staff Charts of the Month*

U.S. Economic Recessions



Source: BEA, NBER, J.P. Morgan Asset Management.
Bubble size reflects the severity of the recession, which is calculated as the decline in real GDP from the peak quarter to the trough quarter except in the case of the Great Depression, where it is calculated from the peak year (1929) to the trough year (1933), due to a lack of available quarterly data.
*Current recession reflects peak (1Q20) to trough (2Q20) decline.
Guide to the Markets – U.S. Data are as of September 29, 2020.

J.P.Morgan
Asset Management

* Submitted by the global equity team

Appendix

Quiet Period for Search Respondents

Real Estate Consultant Services

- ✓ Albourne
- ✓ Callan, LLC
- ✓ Cambridge Associates
- ✓ Meketa Investment Group
- ✓ NEPC, LLC
- ✓ RCLCO Fund Advisors
- ✓ Stepstone Real Estate

Dedicated Managed Account Services

- ✓ Blueprint Capital Advisors
- ✓ HedgeMark Advisors LLC
- ✓ HFR Investments LLC
- ✓ Innocap
- ✓ Lighthouse Investment Partners LLC
- ✓ Lyxor Asset Management
- ✓ Man FRM
- ✓ Maples Group
- ✓ Monroe Capital
- ✓ Ultimus LeverPoint Private Fund Solutions
- ✓ Wilshire Associates Inc

Hedge Funds Emerging Manager Program Separate Account Manager

- ✓ Appomattox Advisory, Inc
- ✓ BlackRock, Inc
- ✓ Goldman Sachs Asset Management
- ✓ GCM Grosvenor
- ✓ New Alpha Asset Management
- ✓ PAAMCO Prisma, LLC
- ✓ The Rock Creek Group, LP
- ✓ Stable Asset Management

Transition Management Bench Service Provider

- ✓ Blackrock Institutional Trust Company, N.A.
- ✓ Citigroup Global Markets, Inc.
- ✓ Loop Capital Markets
- ✓ Macquarie Capital (USA) Inc.
- ✓ State Street Bank & Trust

High Yield Fixed Income Investment Management Services

- ✓ Advent Capital
- ✓ Alliance Bernstein
- ✓ Ares
- ✓ AXA
- ✓ Barings
- ✓ BlackRock
- ✓ Columbia Threadneedle
- ✓ Credit Suisse
- ✓ Crescent Capital HY
- ✓ DDJ Capital
- ✓ Eaton Vance
- ✓ Federated Hermes
- ✓ HPS Investment Partners
- ✓ JP Morgan
- ✓ KKR
- ✓ Loomis Sayles
- ✓ Lord Abbett
- ✓ MacKay Shields
- ✓ Mellon
- ✓ Morgan Stanley
- ✓ Muzinich
- ✓ Nomura
- ✓ Payden and Rygel
- ✓ PGIM
- ✓ PIMCO
- ✓ PineBridge
- ✓ Post Advisory
- ✓ Seix Advisors
- ✓ Shenkman Capital
- ✓ T. Row Price
- ✓ Van Eck Associates
- ✓ Wellington
- ✓ Western Asset
- ✓ Yorkville Asset Management

LACERA

September 30, 2020

TO: Trustees – Board of Investments

FROM: Credit and Risk Mitigation Committee

Vache Mahseredjian, CFA, CAIA, FRM, ASA VM
Principal Investment Officer

Chad Timko, CFA CT
Senior Investment Officer

Quoc Nguyen, CFA QN
Investment Officer

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: **HEDGE FUNDS PORTFOLIO DISCUSSION – PIMCO TACTICAL OPPORTUNITIES**

RECOMMENDATION

Approve re-categorizing the investment in PIMCO Tactical Opportunities (Tac Opps) Onshore Fund L.P. to LACERA's Illiquid Credit portfolio as advanced by the Credit and Risk Mitigation Committee (see **Attachment**).

BACKGROUND

A Risk Mitigation 2020 Mid-Cycle Structure Review was presented to the Board of Investments at its Off-site meeting on August 12, 2020. At this meeting, the group discussed elements of the Risk Mitigation portfolio that have worked and identified areas for improvement such as decreasing exposure to hedged but directional credit strategies. A future initiative to prioritize risk mitigation objectives in the Hedge Funds portfolio was identified, which was to transition LACERA's investment in PIMCO Tac Opps to the Illiquid Credit portfolio.

LACERA began investing in PIMCO Tac Opps in November 2018 at a time when the Hedge Funds portfolio had a more risk-seeking return objective with an annualized return benchmark of cash plus 5%. Given that the Hedge Funds program now sits within Risk Reduction and Mitigation and has an annualized return benchmark of cash plus 2.5%, PIMCO Tac Opps risk and return profile is a lesser fit for the Hedge Funds portfolio. Furthermore, PIMCO Tac Opps did not mitigate risk as it lost 13% in March of this year and has exhibited a high correlation to high yield bond and levered loan indices since the inception of LACERA's investment. Staff believes that PIMCO Tac Opps is better aligned with the objectives of the Illiquid Credit portfolio, which is currently under-allocated relative to its strategic asset allocation target weight.

This recommended portfolio adjustment would improve the risk mitigation characteristics of the Hedge Funds portfolio and move the Illiquid Credit portfolio closer to strategic asset allocation target weights.

At its September 9, 2020 Credit and Risk Mitigation Committee Meeting, the Committee reviewed and advanced this recommendation. LACERA's Consultant for Hedge Funds and Illiquid Credit supports this recommendation. Additional information and rationale can be found in the **Attachment**.

OPTIONS AVAILABLE TO THE BOARD

The Board may wish to approve, modify, or reject the recommendation.

DELIBERATIONS AND OPINIONS EXPRESSED BY THE COMMITTEE

The Committee unanimously approved staff's recommendation to advance this item to the Board of Investments for approval. Committee members did not ask any questions or express any views about this item.

RISKS OF ACTION AND INACTION

If the Board approves the recommendation, staff will administratively re-categorize the PIMCO Tactical Opportunities Onshore Fund L.P. investment to Illiquid Credit. Should the Board reject the recommendation, the Hedge Funds portfolio may have higher than desired exposure to credit risk that would decrease risk mitigation characteristics.

CONCLUSION

The Committee unanimously approved advancing staff's recommendation to re-categorize the investment in PIMCO Tactical Opportunities Onshore Fund L.P. to LACERA's Illiquid Credit portfolio to the Board for approval. If the Board approves, staff will re-categorize this investment accordingly.

Attachment

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

LACERA ATTACHMENT

August 28, 2020

TO: Trustees – Board of Investments

FROM: Vache Mahseredjian VM
Principal Investment Officer

Chad Timko CT
Senior Investment Officer

Quoc Nguyen
Investment Officer

FOR: September 9, 2020 Credit and Risk Mitigation Committee Meeting

SUBJECT: **HEDGE FUNDS PORTFOLIO DISCUSSION – PIMCO TACTICAL OPPORTUNITIES**

RECOMMENDATION

Approve re-categorizing the investment in PIMCO Tactical Opportunities Onshore Fund L.P. to LACERA's Illiquid Credit portfolio.

SUMMARY AND BACKGROUND

A Risk Mitigation 2020 Mid-Cycle Structure Review was presented to the Board of Investments at its Offsite meeting on August 12, 2020. At this meeting, the group discussed elements of the Risk Mitigation portfolio that have worked and identified areas for improvement such as decreasing exposure to hedged but directional credit strategies. A future initiative to prioritize risk mitigation objectives in the portfolio was identified. Accordingly, **Attachment 1** provides additional information about PIMCO Tactical Opportunities Onshore Fund L.P. ("Tac Ops") that is managed by Pacific Investment Management Company LLC. LACERA currently has a $230 million investment in Tac Ops and **Attachment 1** provides rationale for re-categorizing this investment to Illiquid Credit. This action would adjust the Credit portfolio and sub-category of Illiquid Credit closer to strategic asset allocation target weights. LACERA's Consultant for Hedge Funds and Illiquid Credit supports this recommendation as described in **Attachment 2**.

Attachments

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

ATTACHMENT 1

Risk Mitigation – Hedge Funds
Portfolio Discussion
PIMCO Tactical Opportunities

Credit and Risk Mitigation Committee Meeting

September 9, 2020

Vache Mahseredjian – Principal Investment Officer
Chad Timko – Senior Investment Officer
Quoc Nguyen – Investment Officer

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

PIMCO - Tactical Opportunities Fund ("Tac Ops") Background

Strategy Description

- An opportunistic and hedged credit strategy
- Invests across the capital structure in both public and private opportunities
- Consumer, residential, commercial, corporate and specialty finance sectors

2018

- Initial Investment
- Hedge Funds program was more risk-seeking at the time (cash +5% benchmark)

2019

- Investment monitoring
- At 2019 structure review, considered that Tac Ops may best fit in a newly created Credit category

2020

- Today: recommending re-categorizing the $230 million investment to LACERA's Illiquid Credit portfolio

PIMCO - Tactical Opportunities Fund ("Tac Ops") Considerations and Performance

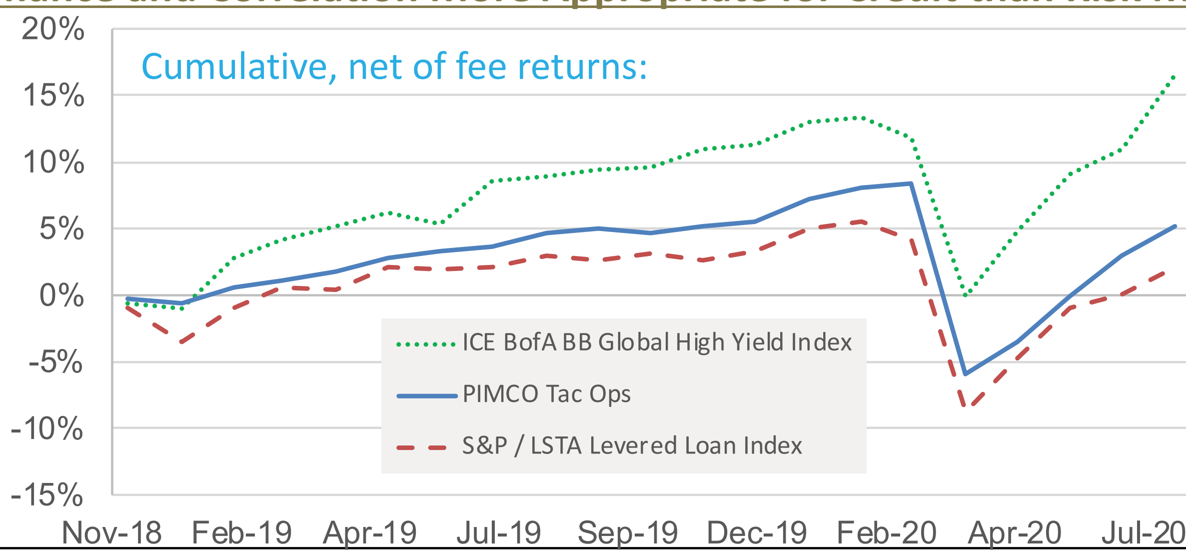
Total Fund Considerations

- Tac Ops shares risk exposures with an Illiquid Credit portfolio that is under construction
- LACERA's Illiquid Credit portfolio is currently below target allocation

Performance Data:

- Tac Ops lost 13% in March 2020 when equities (MSCI AWCI Index) declined 14%
- 0.94 correlation to S&P / LSTA Levered Loan Index since LACERA's investment in November 2018
  - Too much directional exposure for the Risk Mitigation portfolio

Performance and Correlation More Appropriate for Credit than Risk Mitigation:



Returns for Tac Ops are cumulative, net of fees, and from State Street

PIMCO - Tactical Opportunities Fund ("Tac Ops") Recommendation

Recommendation

- Re-categorize the investment in PIMCO Tactical Opportunities Onshore Fund L.P. to LACERA's Illiquid Credit portfolio

Rationale

- **Poor fit**: risk and return characteristics do not align well with risk mitigation and diversification objectives
- **Limited diversification**: risk and return sources are being expressed elsewhere in the Total Fund

ALBOURNE

PIMCO Tactical Opportunities Recommendation

August 21, 2020

To: Trustees
Board of Investments

From: James Walsh, G. Stephen Kennedy
Albourne America LLC

For: September Board of Investments Meeting

Recommendation: Advance the re-categorization of PIMCO Tactical Opportunities Onshore Fund L.P. ("PIMCO Tactical Opportunities" or the "Fund") to LACERA's Illiquid Credit portfolio from the Hedge Funds portfolio to the Board for approval.

Background: Staff is recommending that PIMCO Tactical Opportunities is re-categorized into the Illiquid Credit portfolio instead of the Hedge Funds portfolio. Albourne America LLC ("Albourne"), LACERA's advisor to both the Hedge Funds and Illiquid Credit asset categories, has conducted both Investment Due Diligence and Operational Due Diligence on the Fund and agrees with staff's recommendation.

Several factors play into this recommendation. The Fund shares risk exposures with an Illiquid Credit portfolio that is under construction and currently below target allocation. At the time of investment in 2018, the Hedge Funds program was more risk-seeking; today, PIMCO Tactical Opportunities is a better fit for the newly created Illiquid Credit portfolio.

Conclusion: Albourne recommends the Board considers a re-categorization of the strategy deployed by PIMCO Tactical Opportunities.

Sincerely,

James Walsh	G. Stephen Kennedy
Head of Portfolio Group	Portfolio
Senior Analyst	Senior Analyst

PIMCO Tactical Opportunities Recommendation

Albourne Due Diligence Check List:

This checklist represents a partial summary of the work undertaken by Albourne, in reviewing the Fund for potential redemption by LACERA.

Summary of Albourne Review:

- Investment strategy review:	COMPLETE
- Operational due diligence review:	COMPLETE
- IT systems review:	COMPLETE
- Compliance and Media Searches:	COMPLETE
- Reference checks:	COMPLETE
- Performance review:	COMPLETE
- Financial Statement review:	COMPLETE
- Legal Document review:	COMPLETE
- Onsite due diligence visit:	COMPLETE
- Newsletter review:	COMPLETE

LACERA investment staff have full access to extensive Albourne research reports, which describe in detail the strengths and weaknesses of the Fund.

Disclosure of Potential Conflicts

Based on a review of Albourne's gifts records, there have been no gifts involving Albourne and PIMCO during the past five years.

PIMCO Tactical Opportunities Recommendation

Important Notice

The information in this report does not contain all material information about the fund that is the subject of this report, its investment manager, any of their affiliates or any other related entity to which this report relates, including important disclosures and risk factors associated with an investment in the fund. As used herein, the term "Fund" refers to (i) the specific fund that is the subject of this report, (ii) collectively, the specific fund that is the subject of this report, its investment manager, any of their affiliates or any other related entity to which this report relates, or (iii) investment funds generally, as the context requires.

Before making an investment, LACERA should obtain and carefully review the relevant fund offering documents before investing in the Fund mentioned herein, as such documents may contain important information needed to evaluate the investment and may provide important disclosures regarding risks, fees and expenses. Funds are speculative, involve a high degree of risk, and are illiquid. Past performance is not indicative of future results and LACERA could lose all or a substantial amount of any investment it makes in such Funds. Furthermore, Funds may involve complex tax structures and delays in the distribution of important tax information, may have a limited operating history, may be highly volatile, and there may not be a secondary market for Fund interests. There may be restrictions on redemptions and transfers of Fund interests and such interests may otherwise be illiquid. Funds may also be highly leveraged and may have a fund manager with total investment and/or trading authority over the Fund. It should also be noted that, in the case of hedge funds, there may be a single adviser applying generally similar trading programs with the potential for a lack of diversification and corresponding higher risk; hedge funds may also affect a substantial portion of trades on foreign exchanges, which have higher trading costs.

This report, and the information contained herein, is confidential and for the sole use of LACERA and its Approved Persons. This report may not be reproduced, distributed or transmitted in whole or in part to any third party, except as otherwise permitted under the agreement between Albourne America LLC and LACERA.

L//.CERA

September 22, 2020

TO: Trustees – Board of Investments

FROM: Credit and Risk Mitigation Committee

Vache Mahseredjian, CFA, CAIA, FRM, ASA
Principal Investment Officer

Robert Z. Santos
Investment Officer

Adam Cheng, CFA
Senior Investment Analyst

Jeff Jia
Senior Investment Analyst

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: **RECOMMENDATION TO REDUCE CORE PLUS FIXED INCOME ALLOCATION WITHIN INVESTMENT GRADE BONDS**

RECOMMENDATION

Reduce the Core Plus fixed income target allocation to zero, with a range of 0 to 20%, as advanced by the Credit and Risk Mitigation Committee (see **Attachment**).

BACKGROUND

Staff presented an analysis of the Investment Grade Bond component of the Risk Reduction and Mitigation (Risk Mitigation) functional asset category at the Credit and Risk Mitigation Committee meeting last month. During that presentation, staff provided a high-level overview of the components of Risk Mitigation, focusing on the Core Plus[1] fixed income segment of Investment Grade Bonds.

Core Plus fixed income strategies tend to have more credit risk than their Core counterparts because of their ability to invest in securities with a lower credit rating than the benchmark (Bloomberg Barclays U.S. Aggregate Bond Index). In addition, these portfolios also have a significantly lower allocation to Government securities and an overweight allocation to investment grade bonds than the Index. When combined with the allocation to plus sectors, these differences are primarily responsible

[1]Core Plus fixed income strategies primarily invest in U.S. dollar-denominated investment grade bonds, but can tactically invest in sectors outside of the benchmark (plus sectors) such as high yield, non-dollar, and emerging market debt sectors.

for the higher volatility and underperformance that LACERA's Core Plus managers experienced in the first quarter of this year.

Core Plus strategies significantly underperformed in the first quarter (down 415 bps), whereas Core strategies were down only 16 bps. In the second quarter, Core Plus was up 325 bps, while Core was up 36 bps. This recent example shows that LACERA's Core Plus strategies experienced higher volatility than Core strategies. Over longer periods, Core Plus has exhibited higher risk (as measured by standard deviation of returns) than Core strategies. Core Plus has also exhibited higher active risk (as measured by tracking error) and lower risk-adjusted returns (as measured by information ratio).

Core Plus strategies also have a higher correlation to equity so that during periods of equity market stress, such as the first quarter of this year (or in 2008), Core Plus strategies significantly underperform. This lack of downside protection and capital preservation, combined with the higher risk, lower risk-adjusted return, and lower liquidity make Core Plus strategies a poor fit within a Risk Mitigation functional framework.

OPTIONS AVAILABLE TO THE BOARD

The Board may wish to approve, modify, or reject the recommendation.

DELIBERATIONS AND OPINIONS EXPRESSED BY THE COMMITTEE

The Committee unanimously approved staff's recommendation to advance the reduction of the Core Plus fixed income allocation within Investment Grade Bonds. Committee members asked the following questions:

- Could Core Plus managers take positions in Yankee bonds and Reverse Yankee bonds? If foreign bonds were issued by an entity in a country classified as emerging, then would that be considered an emerging market bond?
    - Yankee bonds are U.S. dollar-denominated bonds issued by foreign entities (sovereigns, government-supported entities, and foreign corporations). Because they are denominated in U.S. dollars, they are part of the U.S bond market. If the bonds are rated investment grade, then both Core and Core Plus managers can invest in them. If the bonds are rated below investment grade, then only Core Plus managers can invest in them.
    - Reverse Yankee bonds are bonds issued by U.S. entities denominated in a foreign currency. Reverse Yankee bonds are a subset of a much broader category of foreign bonds that Core Plus managers are allowed to invest in. Core managers are not allowed to invest in bonds denominated in a foreign currency, even if the issuer is a U.S. entity.
    - Yes, bonds issued by an entity in an emerging country (usually based on measures of income per capita) would be considered an emerging market bond. If that bond is denominated in U.S. dollars, it could also be considered a Yankee bond.

Please refer to the informational memo on Yankee bonds in this month's Board materials for additional information.

RISKS OF ACTION AND INACTION

If the Board approves the recommendation, staff will begin to gradually reduce the Core Plus target allocation and re-invest the proceeds into the Core category. Staff anticipates finalizing the transition by the time the Fund's Strategic Asset Allocation Study is completed next year.

Should the Board reject the recommendation, the Investment Grade Bonds component of Risk Mitigation could incur a reduction in downside protection, a rise in volatility and tracking error, and an increased correlation to equities. This decision would counter the role of Investment Grade Bonds within a Risk Mitigation functional framework.

CONCLUSION

The Committee unanimously approved staff's recommendation to advance the reduction in Core Plus fixed income allocation within Investment Grade Bonds to the Board for approval. If the Board approves, staff will implement the reduction and re-invest the proceeds into the Core fixed income strategy.

Attachment

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

RS

LACERA

August 25, 2020

TO: Trustees - Credit and Risk Mitigation Committee

FROM: Vache Mahseredjian, CFA, CAIA, FRM, ASA VM
Principal Investment Officer

Robert Z. Santos RS
Investment Officer

Adam Cheng, CFA AC
Senior Investment Analyst

Jeff Jia JJ
Senior Investment Analyst

FOR: September 9, 2020 Credit and Risk Mitigation Committee Meeting

SUBJECT: **RECOMMENDATION TO REDUCE CORE PLUS FIXED INCOME ALLOCATION WITHIN INVESTMENT GRADE BONDS**

RECOMMENDATION

Advance staff's recommendation to reduce the Core Plus fixed income target allocation within Investment Grade Bonds to zero, with a range of 0-20%, to the Board of Investments for approval in October. A detailed explanation of the reasons supporting this recommendation is provided in **Attachment 1**.

BACKGROUND

The objective of the Risk Reduction & Mitigation (Risk Mitigation) functional asset category is, as the name indicates, to reduce the risk of the Total Fund. Risk Mitigation consists of Cash, Investment Grade Bonds, and Hedge Funds. Investment Grade Bonds are further divided into Core and Core Plus investments, and the focus of today's recommendation is the Core Plus segment. Investment Grade Bonds are expected to produce modest returns with a low level of volatility and a low correlation to Growth assets. They are also expected to provide liquidity for paying benefits and for rebalancing purposes. The need to provide liquidity means that capital preservation is important, so even short-term performance matters.

LACERA has been reducing the allocation to Core Plus for several years in order to dampen the volatility of the Investment Grade bond portfolio. The most recent cut was in January 2019, when the Board of Investments approved staff's recommendation to reduce the Core Plus allocation from 35% to 20%. Today's recommendation continues that trend by reducing the Core Plus target to zero, with a range of 0 to 20%. This range provides flexibility to reduce the allocation in an orderly manner as we complete the upcoming Strategic Asset Allocation review.

DISCUSSION

Staff presented a Mid-Cycle Structure Review of the Risk Mitigation functional asset category at the August 2020 Board of Investments off-site meeting. At that meeting, staff underscored the key role Risk Mitigation serves within the Total Fund and noted that we would review the allocation to Core Plus. The Core Plus strategy invests in sectors that are outside the benchmark index—the so-called "plus" sectors: high yield bonds, emerging market debt, and non-dollar denominated bonds. Therefore, the strategy bears a material amount of credit risk. During times of market stress ("risk off" environment), these sectors introduce a significant amount of volatility, leading to material underperformance relative to the index, and even to negative returns. Furthermore, LACERA already has explicit allocations to the "plus" sectors within the Credit functional category, so there's no need to invest in those sectors within Risk Mitigation. As such, Core Plus is at odds with the objectives of Risk Mitigation.

The attached PowerPoint presentation covers the role of Risk Mitigation, speaking specifically to Investment Grade Bonds. The slides provide a breakdown of the allocation between Core and Core Plus and highlight the additional risks introduced by Core Plus. These risks reflect not only investment in "plus" sectors, but also material differences in portfolio structure relative to the index--even with in-benchmark investments. As a result, Core Plus has a higher tracking error and lower information ratio when compared to the Core strategy.[1]

The findings are in support of staff's recommendation to reduce the allocation to Core Plus altogether. The adjustment would provide better downside protection, reduce overall volatility as well as tracking error, and decrease the correlation to equities. If the Committee advances the recommendation--and if the Board approves it in October--staff will begin reducing the Core Plus target allocation gradually and re-investing the proceeds into the Core category. We would anticipate finalizing the transition by the time the Fund's Strategic Asset Allocation Study is completed next year.

Meketa Investment Group ("Meketa"), LACERA's general investment consultant, concurs with staff's recommendation and has provided a support memo (**Attachment 2**).

CONCLUSION

Staff conducted an analysis of Investment Grade Bonds within Risk Mitigation and recommends adjusting the target allocation to Core Plus fixed income strategies to zero, with a range of 0-20%.

Attachment

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

[1] Tracking error is the standard deviation of excess returns. It is a measure of active risk—risk relative to the benchmark. Information ratio is the ratio of excess return to tracking error. It is a measure of active return per unit of active risk.

ATTACHMENT 1

Recommendation to Reduce Core Plus Allocation

Credit and Risk Mitigation Committee Meeting
September 9, 2020

Vache Mahseredjian – Principal Investment Officer
Robert Santos – Investment Officer
Adam Cheng – Senior Investment Analyst
Jeff Jia – Senior Investment Analyst

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

Role of Risk Reduction and Mitigation

Risk Mitigation

- Moderate income
- Reduce Total Fund risks
- Capital preservation*
- Downside protection*
- Lower volatility
- Low correlation to growth assets
- Source of liquidity

Cash

- Primary source of Total Fund liquidity
- Paramount to LACERA's mission of providing the promised benefit
- Focus on capital preservation

Investment Grade Bonds

- Secondary source of Total Fund liquidity
- Generate income
- Lower volatility
- Low correlation to global equity

Hedge Funds

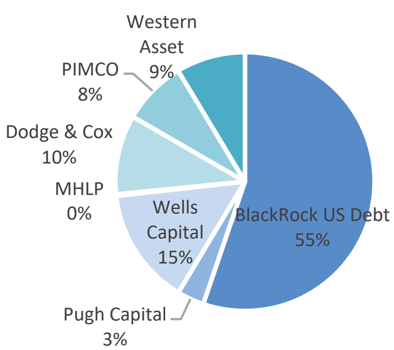
- Downside protection*
- Benefit Total Fund Sharpe ratio
- Differentiated sources of return
- Non-directional market risks
- Contribute positive returns frequently

** Especially in stressed equity markets or otherwise when growth assets experience broad price declines*

Investment Grade Bonds
Portfolio Positioning

(as of June 2020)	Market Value (in $ billion)	% of Risk Mitigation	% of total Fund
Investment Grade Bonds	11.6	80.0%	19.7%

Investment Grade Bonds Composition



Investment Grade Bonds ($ Value)

	Mkt Value ($M)	% of Risk Mitigation: Target Alloc.	% of Risk Mitigation: Alloc. Range
Core	$ 8,482.91	80%	70% - 90%
Core Plus	$ 3,070.49	20%	10% - 30%
Total IG Composite	$ 11,553.40		

Core Investment Grade Bonds

	Mkt Value ($M)	% of Core
BlackRock U.S. Debt Fund	$ 6,380.55	75.2%
Member Home Loan Program	$ 22.04	0.3%
Pugh Capital	$ 388.59	4.6%
Wells Capital	$ 1,691.73	19.9%
Total Core	$ 8,482.91	

Core Plus Investment Grade Bonds

	Mkt Value ($M)	% of Core Plus
Dodge	$ 1,148.07	37.4%
PIMCO	$ 926.29	30.2%
Western	$ 996.13	32.4%
Total Core Plus	$ 3,070.49	

Asset weights as of June 30, 2020

Core Plus Portfolio Positioning

Risk Characteristics & Sector Distribution as of June 30, 2020			
Risk Characteristics	Core Plus Fixed Income	BBG US Aggregate Bond Index	Difference
Yield to Maturity	2.41	1.27	1.14
Avg. Coupon	3.12	3.03	0.09
Avg. Duration	5.82	6.04	0.96
Avg. Quality	A+	AA1/AA2	AA
BBB's (%)	23.17	14.37	8.80
BB's (%)	6.79	0.00	6.79
B's (%)	1.20	0.00	1.20
Less than B (%)	0.46	0.00	0.46
Non-Rated	0.02	0.00	0.02
Sector Distribution			
Cash & Equivalents	10.19	0.00	10.19
Governments	6.61	43.21	(36.60)
Corporate (Inv. Grade)	41.74	27.40	14.34
Mortgage-Backed	26.52	26.83	(0.31)
CMBS	2.53	2.18	0.35
Asset-Backed	3.96	0.38	3.58
Domestic High Yield	3.79	0.00	3.79
Inv. Grade Non-Dollar	1.53	0.00	1.53
EMD	2.90	0.00	2.90
Other	0.12	0.00	0.12
Non-Dollar High Yield	0.10	0.00	0.10

Core Plus Strategies

- Primarily invest in U.S. Dollar denominated investment grade bonds, but can tactically invest in sectors outside of the benchmark such as high yield, non-dollar, and emerging market debt securities

Not in Benchmark

Even for sectors included in the benchmark, large allocation differences can lead to significant tracking error in times of market stress.

Not in Benchmark

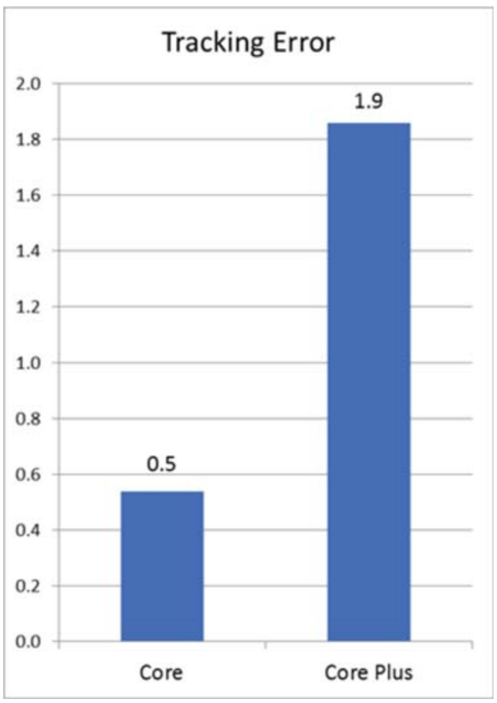
Asset weights as of June 30, 2020

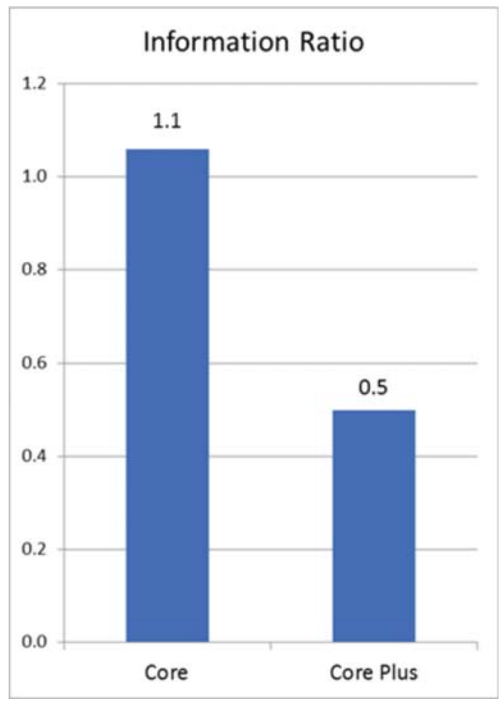
Core Plus Returns Have Been Volatile

Composite Absolute Performance (net-of-fees)				As of July 2020			
	1Q20	2Q20	Ytd	1 Year	5 year	10 Years	2008
Core	2.99%	3.26%	7.99%	10.41%	4.84%	4.44%	1.94%
Core Plus	-1.00%	6.15%	7.41%	10.39%	5.20%	4.80%	-4.89%
Benchmark	3.15%	2.90%	7.72%	10.12%	4.47%	3.87%	5.24%
Core (Excess Return)	-0.16%	0.36%	0.27%	0.29%	0.38%	0.58%	-3.30%
Core Plus (Excess Return)	-4.15%	3.25%	-0.31%	0.27%	0.74%	0.93%	-10.13%

- Short-term returns are important because Investment Grade bonds assist in providing liquidity.
- By taking risk outside of the benchmark, Core Plus has outperformed over the long-term, but materially underperformed its benchmark during periods of market stress. This runs counter to the objectives of the Risk Reduction & Mitigation category.
- Significant negative returns in 1Q 2020, and in 2008 are inconsistent with the goals of downside protection and capital preservation.

Core Plus Has Much Higher TE and Lower IR Than Core





- Significantly higher active risk as defined by tracking error
- Lower risk-adjusted return, as measured by Information Ratio

Calculations are based on 10-year trailing returns as of July 31, 2020

Recommendation and Expected Outcome

Recommendation

Advance staff's recommendation to reduce the Core Plus target allocation to zero, with a range of 0 to 20%.

- Re-allocate the funds to Core strategies

Expected Outcome

Better alignment with goals and objectives of Risk Mitigation functional category

- Better downside protection
- Better liquidity in stressed markets
- Lower tracking error
- Higher information ratio
- Lower correlation to equity

MEKETA
INVESTMENT GROUP

5796 Armada Drive
Suite 110
Carlsbad, CA 92008

760.795.3450
Meketa.com

MEMORANDUM

TO: LACERA Board of Investments
FROM: Stephen McCourt, Leandro Festino, Tim Filla, Alina Yuan
CC: Meketa Investment Group
DATE: August 27, 2020
RE: Core Plus Allocation Adjustment

Background

At the December 2018 Board of Investments ("Board") meeting, the Board approved Core and Core Plus target allocations of 80% and 20%, respectively, within Investment Grade Bonds. Earlier that year, in May of 2018, the Board approved the recommendation for both Core categories to fall under the Risk Reduction and Mitigation functional category. The purpose of Risk Reduction and Mitigation is to provide capital preservation, downside protection, and lower volatility and correlation to global equity.

Recommendation & Rationale

Meketa worked with staff to review both Core and Core Plus investment performance over time. Staff compiled a list of observations, as did Meketa independently. Ultimately, we discussed different alternatives and viewpoints and agreed on a joint action plan that brings the target of Core Plus to 0% with a range of 0% to 20%, as explained in detail in staff's memo. Meketa concurs and agrees with staff's research, analysis, and recommendations.

While Core Plus has outperformed over the long term, as an asset class, it has underperformed its benchmark materially during periods of high market stress, most recently during the COVID-19 pandemic. Core Plus returned -1.0% during the first quarter of 2020. In contrast, its other counterpart, Core, returned 3.0% during the first quarter of 2020. The underperformance from Core Plus during high market volatility is not the expected or desired outcome of an asset class within the Risk Mitigation category.

Core Plus has a lower correlation than Core to high-grade bond indices and it has a higher correlation than Core to equity indices. This attribute is contradictory to Risk Mitigation's goal of holding a low correlation to growth assets. Upon additional review with staff, we concur with staff's recommendation to reduce the target allocation of Core Plus to 0%, and re-allocate the funds to Core strategies over time. Increasing Core's allocation will help lower the potential tracking error within Investment Grade Bonds and provide better downside protection and liquidity during stressed markets.

In conclusion, we concur with staff's recommendation to decrease the target allocation of Core Plus to better align Investment Grade Bonds to the objectives of its functional category. We believe the proposed changes will help streamline portfolio efficiency. We would be pleased to elaborate on this recommendation at the upcoming Board meeting in September, and assist both staff and the Board during the coming months in matters related to this review. In the meantime, if you have any questions or would like additional information, please call us at (760) 795-3450.

SM/LF/TF/AY/sf

September 18, 2020

TO: Trustees - Board of Investments

FROM: Corporate Governance Committee

Scott Zdrazil
Senior Investment Officer

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: **CONSOLIDATING CORPORATE GOVERNANCE POLICIES**

RECOMMENDATION

Approve a consolidated *Corporate Governance and Stewardship Principles* policy.

BACKGROUND

On September 9, 2020, the Corporate Governance Committee ("Committee") unanimously recommended that the Board of Investments ("Board") approve the consolidation of LACERA's *Corporate Governance Principles* and *Corporate Governance Policy* into the *Corporate Governance and Stewardship Principles*. As detailed in the attachments, the proposed *Corporate Governance and Stewardship Principles* merges the content of the two current policies, incorporates modifications to the introductory guiding principles to reorient them to a total fund view, and modifies principles language addressing corporate board composition and diversity to explicitly incorporate the LGBTQ community.

Attached to this memo are the materials presented to the Committee explaining the proposed consolidation, including a presentation and a color-coded draft merged document. No modification has been made subsequent to Committee review and approval of the draft merged policy being presented for Board approval (**Attachment**).

OPTIONS AVAILABLE TO THE BOARD

The Board may wish to approve, modify, or reject the recommendation.

DELIBERATIONS AND OPINIONS EXPRESSED BY THE COMMITTEE

The Committee expressed general comfort with staff's recommendation and unanimously approved the motion for consolidating LACERA's *Corporate Governance Principles* and *Corporate Governance Policy* into the *Corporate Governance and Stewardship Principles*. Trustees concurred that consolidation of the policies would be sensible and acknowledged the broadening of the inclusiveness of diversity to extend beyond gender, race, and ethnicity backgrounds to gender identities and sexual orientations.

RISKS OF ACTION AND INACTION

Staff believes that a consolidated policy would enhance policy cohesion and provide unified policy guidance for LACERA's corporate governance approach for both internal and external audiences. In addition, the incorporation of a reference to gender identity and sexual orientation to promote consideration of multiple dimensions of diversity would codify LACERA's approach to ensure broad, equitable inclusion of talent.

The risk of inaction is namely that, absent a consolidation of policies, LACERA will continue to operate its corporate governance program through the lens of a separate *Corporate Governance Policy* and *Corporate Governance Principles* and would not explicitly incorporate a reference to gender identity and sexual orientation to promote consideration of multiple dimensions of diversity.

CONCLUSION

The Committee unanimously approved this recommendation that LACERA consolidate the *Corporate Governance Policy* and *Corporate Governance Principles* into the *Corporate Governance and Stewardship Principles*.

Attachments

Noted and reviewed:

____
Jonathan Grabel
Chief Investment Officer

LACERA

August 31, 2020

TO: Trustees – Corporate Governance Committee

FROM: Scott Zdrazil
Senior Investment Officer

FOR: September 9, 2020 Corporate Governance Committee Meeting

SUBJECT: ***Consolidating Corporate Governance Policies***

RECOMMENDATION

Recommend that the Board of Investments approve a consolidated *Corporate Governance and Stewardship Principles* policy.

BACKGROUND

At the October 2019 Corporate Governance Committee (Committee) meeting, staff solicited and received positive feedback from Trustees to consolidate the two policies that guide LACERA's corporate governance-related efforts:

1. LACERA's *Corporate Governance Principles* (CG Principles) articulate LACERA's fundamental principles on a range of common corporate governance topics; and

2. LACERA's *Corporate Governance Policy* (CG Policy) defines the stewardship strategies LACERA pursues to advance corporate governance practices in line with its CG Principles, such as proxy voting and corporate engagement.

Staff believes that the substance of the CG Principles and CG Policy are comprehensive and have provided adequate guidance for LACERA's corporate governance initiatives. However, staff continues to believe that a consolidated policy would enhance policy cohesion and provide unified policy guidance for LACERA's corporate governance approach for both internal and external audiences. Accordingly, staff has prepared a draft merged document for Committee consideration.

The attached proposed document proposes three modifications:

1. Merge the current *Corporate Governance Principles* and *Corporate Governance Policy;*
2. Reorient language in the five core guiding principles to the total fund to orient the Principles as guidance for good governance and ESG matters for the full fund and rename the consolidated policy *Corporate Governance and Stewardship Principles*;
3. Refine language in the principles on board composition and diversity to ensure inclusivity of the LGBTQ community (lesbian, gay, bisexual, transgender, and questioning).

The attached materials provide further explanation and information:

1. A brief presentation summarizing the policy consolidation that will be referenced at the Committee's September 9th meeting (**Attachment 1**);

2. A draft consolidated policy that has been color coded to represent how language has been pulled from both documents into the proposed merged policy (**Attachment 2**);

The current *Corporate Governance Principles* and *Corporate Governance Policy* are available on LACERA's website for reference (through the embedded links) and have not been included to simplify materials.

Please note that in an effort to simplify Committee materials – per previous Trustee input – these materials do not include a "clean version" of the merged policy. A clean version is available upon request. Should the Committee approve Board consideration of the merged document, staff will include a clean version for the full Board's consideration and approval.

Attachments

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

Attachment 1

Consolidating Corporate Governance Policies

Corporate Governance Committee
September 9, 2020

Scott Zdrazil, Senior Investment Officer

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

Discussion Outline

At the Committee's October 2019 meeting, staff proposed and received positive feedback to consolidate LACERA's *Corporate Governance Principles* and *Corporate Governance Policy* documents

This deck provides brief background information on the action item

1. Policy Objectives
2. Recent History of Policy Harmonization
3. Structure and Modifications of the Proposed Merged Document

Refreshment on Objectives of Corp Gov Policies

1. Maintain ***succinct, principles-based,*** and ***publicly-accessible*** policy of LACERA's views on sound corporate governance practices
   - Inclusive of broader ESG matters (e.g., climate change, human capital, human rights, etc.)

2. Guide stewardship activities
   - Proxy votes during high-volume, tightly condensed proxy season
   - Corporate engagement
   - Financial market policy and regulations (SEC comment letters, etc.)
   - Collaboration with other investors through associations e.g. CII, PRI
   - Reference point for engagement with asset managers on investment practices

3. Promote policy cohesion; avoid unnecessary proliferation
   - *Principles* policy referenced in and attached to LACERA *Investment Policy Statement*

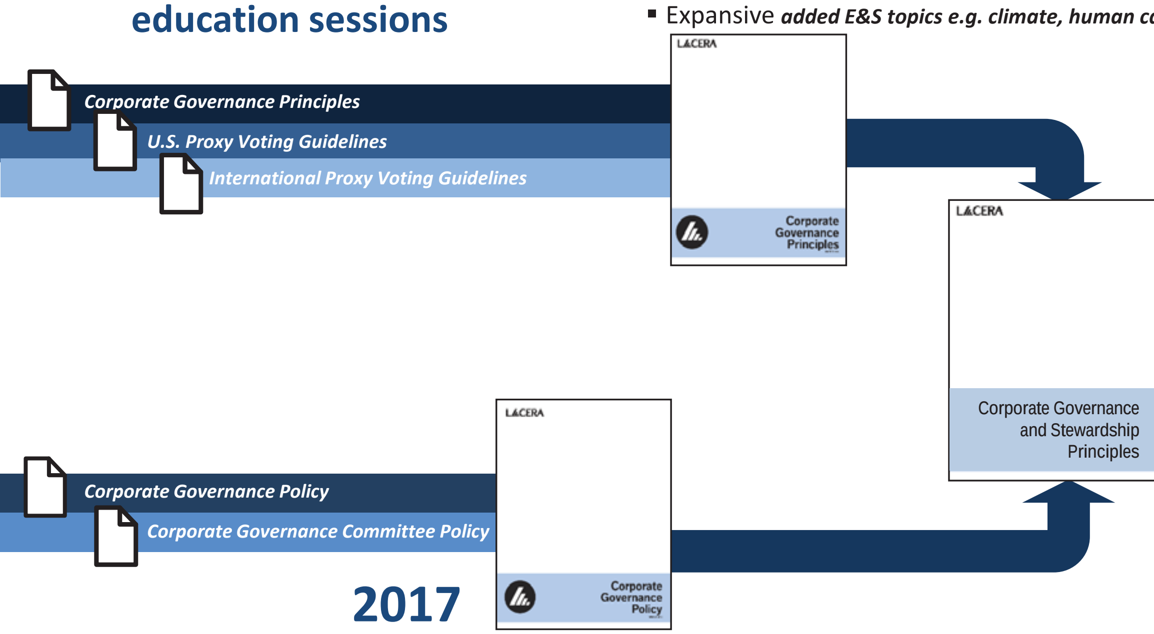
Background to Policy Consolidation

LACERA refreshed and harmonized multiple governance policies after six months of education sessions

2018

Harmonized three policies **articulating our Principles on good governance**

- Principles-based
- Universal ***across markets***
- Accessible ***simplified, public, "plain English"***
- Expansive ***added E&S topics e.g. climate, human capital***



Today

Propose merging two remaining policies

2017

Consolidated two policies **defining stewardship activities and roles** (e.g. proxy voting , engagements)

How The Proposed Merged Policy is Structured and Modified

Three Proposed Modifications

1. Merge the two existing policies section-by-section
2. Orient the guiding principles that frame the policy towards the total fund and rename to *Corporate Governance and Stewardship Principles*
3. Expand principle pertaining to board composition and diversity

1. Proposed Merged Policy By Section

The table of contents below illustrates how the proposed merged policy pulls from each current policy section-by-section

No substantive changes are made unless otherwise noted in following slides

Current CG Principles

Table of Contents

About LACERA
Statement of Purpose
Principles
- Directors
- Investor Rights and Capital Structure
- Compensation and Incentives
- Performance Reporting
- Environmental and Social Factors

Corporate Governance and Stewardship Principles

Merged Sections/Contents

About LACERA

Statement of Purpose

Legal Authority

Stewardship Strategies

Principles
- Directors
- Investor Rights and Capital Structure
- Compensation and Incentives
- Performance Reporting
- Environmental and Social Factors

Responsibilities and Delegations

Policy Review and Affirmation

Appendix
Procedures for Evaluating Divestments

Current CG Policy

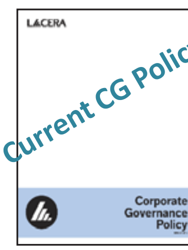


Table of Contents

Purpose & Strategic Objective
Legal Authority
Program Components
Responsibilities and Delegations
Policy Review and Affirmation
Appendix
Procedures for Evaluating Divestments

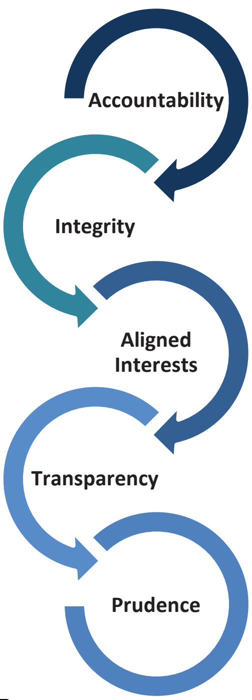
2. Orient Towards Total Fund View

The current *Principles* are organized into five sections covering common governance topics.

Each section is guided by a framing principle, which ***collectively aim to promote sustainable value***.

Modifications are intended to position the Principles to the Total Fund as a reference on ESG issues, following fund-wide discussions on issues articulated in the *Principles* (e.g. human capital, climate change

Refresh policy name to ***Corporate Governance and Stewardship Principles*** to invoke fund stewardship



Accountability: Governance structures and practices should be designed to promote accountability to the investors who provide the firm with capital. This extends to both board directors overseeing portfolio companies on investors' behalf, and external managers entrusted with LACERA's capital. Accountability helps to ensure that investments are managed in the best interests of investors.

Integrity: Integrity and trust are the cornerstone of financial markets and essential for economic stability. Core investor rights and protections are crucial to promoting integrity in financial markets.

Aligned Interests: Compensation and incentives should align the interests of the managers of capital and the investors who provide capital. This extends to senior executives at portfolio companies and external asset managers managing capital on LACERA's behalf.

Transparency: Firms should provide investors with clear, comprehensive, and timely disclosures about fundamental elements of the firm's business, financial activities, and performance.

Prudence: Firms should prudently identify, assess, and manage environmental and social factors that may impact the firm's ability to generate sustainable economic value.

Current Principles policy language is in **blue**; Proposed modified language is in **purple**

3. Expand Board Composition and Diversity Principle

The *Principles* take a broad view of board diversity, including skills, experience, and attributes.

LACERA engages corporate boards on diversity of gender, race/ethnicity, and LGBTQ inclusivity to ensure broad, equitable inclusion of talent

The recommended policy modifications (in **purple** below) incorporate reference to gender identity and sexual orientation to promote consideration of multiple dimensions of diversity

> The board should be composed of highly talented individuals who are best positioned to oversee the company's strategy for creating and sustaining value. Boards should give consideration to ensuring that directors collectively possess a diverse set of relevant skills, competencies, and attributes to exercise oversight on investors' behalf, including expertise, geographic familiarity, and professional backgrounds relevant to the company's strategic objectives. The board should strive for a suitable mix of tenures to ensure both institutional familiarity and fresh perspectives on the board, as a firm's market environment and business strategies evolve.
>
> The board should establish and disclose policies and processes for ensuring that it identifies and nominates suitable directors from a wide pool of candidates relevant to its business strategy, inclusive of ~~including~~, but not limited to, diverse gender, racial, and ethnic backgrounds, gender identities and sexual orientations. A diverse and inclusive board is better positioned to effectively deliberate and oversee business strategy in investors' interests.
>
> *Current policy language in **blue*** *Proposed modification in **purple***

Attachment 2

DRAFT - Color-coded draft consolidated policy for review

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION LACERA

Corporate Governance and Stewardship Principles

[Date TBD]

CG Principles language in BLUE **CG Policy language in GREEN** **New language in PURPLE**

Corporate Governance and Stewardship Principles

Table of Contents

CG Principles language in BLUE CG Policy language in GREEN New language in PURPLE

About LACERA

The Los Angeles County Employees Retirement Association ("LACERA") administers defined benefit retirement plans and other post-employment benefits for employees of Los Angeles County and certain other districts.

The Los Angeles County Board of Supervisors established LACERA in 1937 under the terms of California's County Employees Retirement Law. LACERA is governed by the California Constitution (Article XVI, Section 17), the California County Employees Retirement Act of 1937, and the California Public Employees' Pension Reform Act of 2013. Today, LACERA serves over 160,000 active and retired members.

LACERA's mission is to "produce, protect, and provide the promised benefits." LACERA aims to fulfill its mission through prudent investment and conservation of plan assets, in accordance with ~~it's~~ the *Investment Beliefs* that frame its *Investment Policy Statement* and in consideration of actuarial analysis.

LACERA
Mission Statement:

We Produce, Protect, and Provide the Promised Benefits

LACERA's Board of Investments is responsible for establishing LACERA's investment policy and objectives, as well as exercising oversight of the investment management of the fund.

Statement of Purpose

LACERA seeks to responsibly steward its investments in a manner that promotes and safeguards the economic interests of LACERA and its members, consistent with LACERA's mission to "produce, protect, and provide the promised benefits." LACERA believes that robust investor rights, strong corporate governance practices and policies at the firms in which it invests, and sound public policies governing financial markets help generate long-term economic performance. LACERA prudently exercises its rights as an investor to support corporate governance practices and financial market policies that promote sustainable, long-term value and enhance LACERA's ability to fulfill its mission.

The fundamental objective of LACERA's *Corporate Governance and Stewardship Principles* (the "Principles") is to safeguard and promote the economic interests of the trust. The *Principles* identify LACERA's core principles of corporate governance and the key stewardship strategies LACERA pursues to advance them. They are intended to further the *Investment Beliefs* that frame LACERA's *Investment Policy Statement* by articulating LACERA's view on sound governance and broader environmental, social, and governance (also known as "ESG") issues.

LACERA seeks to exercise the legal rights it has as an investor and to steward its assets by applying these *Principles.* The *Principles* guide LACERA's proxy votes, engagements with policymakers and portfolio companies, and collaboration with other institutional investors when it shares common objectives (such as actively participating in investor associations). The *Principles* help inform LACERA's investment process, including the evaluation and monitoring of portfolio investments, consistent with the rights and legal obligations of each asset. And *the Principles* outline the legal authority, roles, and responsibilities guiding LACERA's application of the *Principles* and initiatives.

In advocating practices in line with these *Corporate Governance and Stewardship Principles*, LACERA aims to maximize the long-term value of plan holdings.

CG Principles language in BLUE **CG Policy language in GREEN** **New language in PURPLE**

Legal Authority

The LACERA Board of Investments has “the sole and exclusive fiduciary responsibility over the assets of" the system, as provided by the California Constitution (Article XVI, Section 17(a)). LACERA exercises its legal rights on corporate governance matters in furtherance of its fiduciary duty under Article XVI, Section 17 of the California Constitution, the County Employees Retirement Law of 1937 (CERL), and other governing laws, regulations, and case authority. The Board's fiduciary duty has two components:

A. Duty of Loyalty. Under the duty of loyalty, Board members have the sole and exclusive responsibility to administer the system in a manner that will assure prompt delivery of benefits and related services to the participants and their beneficiaries. (Article XVI, Section 17(a).) Board members shall discharge their duties with respect to the system solely in the interest of, and for the exclusive purposes of providing benefits to, participants and their beneficiaries, minimizing employer contributions thereto, and defraying reasonable expenses of administering the system. (CERL Section 31595(a).) The Board's duty to participants and their beneficiaries shall take precedence over any other duty. (Article XVI, Section 17(b).)

B. Duty of Prudence. Under the duty of prudence, Board members shall discharge their duties with respect to the system with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with these matters would use in the conduct of an enterprise of a like character and with like aims. (Article XVI, Section 17(c); CERL Section 31595(b).) "[T]he Board may, in its discretion, invest or delegate the authority to invest, the assets of the fund through the purchase, holding, or sale of any form or type of investment, financial instrument, or financial transaction when prudent in the informed opinion of the Board." (CERL Section 31595.) Further, the Board "[s]hall diversify the investments of the system so as to minimize risk of loss and to maximize the rate of return, unless under the circumstances it is clearly prudent not to do so." (CERL Section 31595(c).)

The fiduciary obligations of prudence and loyalty to plan participants and beneficiaries compel and guide LACERA’s corporate governance activities and consideration of financially material environmental, social, and governance factors in its investment process. LACERA’s fiduciary duties extend to, but are not limited to, prudently managing its proxy votes, vigilantly monitoring and diligently mitigating risks to the value of its investments, and judiciously determining action in order to assist in the effective administration of the fund and promote the interest of members and their beneficiaries.

Stewardship Strategies~~Program Components~~

LACERA's corporate governance and stewardship efforts~~program~~ may include the following strategies ~~components and responsibilities~~:

A. Proxy Voting

Proxy votes are plan assets, have value, and should be managed in a manner consistent with fiduciary duty and LACERA's interest in long-term value. LACERA exercises its voting rights for the exclusive benefit of LACERA's members and votes proxies in accordance with its *Corporate Governance and Stewardship Principles*.

LACERA seeks to vote all proxies for which it has proxy voting authority. LACERA coordinates with its custodian bank and investment service vendors to maximize its opportunities to responsibly cast proxy votes in line with its fiduciary duty, while recognizing that administrative requirements and practices in certain local markets may affect LACERA's ability to cast proxy votes, such as delayed notification of proxies subsequent to vote deadlines and required powers of attorney in subcustodial chains. At meetings that require share blocking, LACERA evaluates the economic value of casting a proxy vote compared to the risk of limiting trading in the designated security and may opt to refrain from voting in order to preserve LACERA's ability to act in its best economic interests.

LACERA participates in securities lending to earn incremental income, per LACERA's *Securities Lending Program Policy*. In securities lending, the legal rights accorded those shares, including proxy voting, are transferred to the borrower of the securities during the period that the securities are on loan. As a result, LACERA forfeits its right to vote proxies on loaned securities unless those shares have been recalled from the borrower no later than the share's record date.

B. Corporate Engagement

LACERA advocates its *Investment Beliefs*, *Corporate Governance and Stewardship Principles*, and mission through dialogue and engagement strategies with portfolio companies and external asset managers, which may include exercising legal rights associated with LACERA's investments, such as sponsoring shareowner resolutions.

C. Public Policy

LACERA represents its interests to policymakers, such as legislators, regulatory agencies, and standards-setting agencies, in line with its *Corporate Governance and Stewardship Principles*.

D. Investor Collaboration

LACERA collaborates with other public pension funds, asset owners and asset managers, both informally and formally through investor associations such as the Council of Institutional Investors, in order to enhance LACERA's ability to achieve its objectives and advance its *Corporate Governance and Stewardship Principles*.

Principles

The *Corporate Governance and Stewardship Principles* are organized into five sections. Each section addresses common corporate governance, proxy voting, and broader environmental, social, and governance ("ESG") issues relevant to LACERA's investment portfolio and investment partners. The five sections address issues pertaining to boards of directors, investor rights and capital structure, executive compensation and incentives, performance reporting, and environmental and social factors.

The *Corporate Governance and Stewardship Principles* are guided by five core concepts that collectively provide a framework by which LACERA aims to promote sustainable investment returns and responsible stewardship of fund assets:

> **Accountability**: Governance structures and practices should be designed to promote accountability to the investors who provide the firm with capital. This extends to both board directors overseeing portfolio companies on investors' behalf, and external managers entrusted with LACERA's capital. Accountability helps to ensure that investments are managed in the best interests of investors.
>
> **Integrity**: Integrity and trust are the cornerstone of financial markets and essential for economic stability. Core investor rights and protections are crucial to promoting integrity in financial markets.
>
> **Aligned Interests**: Compensation and incentives should align the interests of the managers of capital and the investors who provide capital. This extends to senior executives at portfolio companies and external asset managers managing capital on LACERA's behalf.
>
> **Transparency**: Firms should provide investors with clear, comprehensive, and timely disclosures about fundamental elements of the firm's business, financial activities, and performance.
>
> **Prudence**: Firms should prudently identify, assess, and manage environmental and social factors that may impact the firm's ability to generate sustainable economic value.

Fiduciary duty guides LACERA's *Corporate Governance and Stewardship Principles.* LACERA recognizes that sound governance balances the rights of investors providing a firm with capital with the role and responsibility of portfolio company boards to direct and manage the firm.

LACERA recognizes that the application of the *Principles* may vary depending on the specific terms, constraints, and nature of LACERA's investments in different asset classes. In public markets where LACERA retains voting authority to vote in line with these *Principles,* LACERA evaluates the financial impact of each issue presented on corporate proxies and votes proxies for the exclusive benefit of plan participants and beneficiaries in all instances. LACERA may oppose overly prescriptive or unduly burdensome measures proposed on corporate proxies, or resolutions that may otherwise restrict a firm's board of directors from acting in the best economic interests of investors.

LACERA also recognizes that the laws, regulations, and customs guiding corporate governance practices vary by market. LACERA seeks to apply its *Corporate Governance and Stewardship Principles* in a universal and consistent manner, while observing and taking into consideration — as applicable and appropriate — local laws, regulations, and customs.

I. Directors

The board of directors drives the strategic direction and oversight of the firm and its management. LACERA relies upon the directors of portfolio companies to exercise effective oversight and ensure that the firm is managed in the best interests of investors. Directors should understand the firm's long-term business strategy as well as risks that may impact the firm's value, and demonstrate a record of sound stewardship and performance. LACERA advocates policies and practices that encourage directors to be accountable to investors. Accountability ensures that a firm's operations and reporting are managed in the best interests of investors.

A. Independent Oversight

1. **Board Independence:** At least two-thirds of the board should be composed of independent directors in order to oversee management on behalf of investors, promote accountability to investors, and avoid potential conflicts of interest.

   An independent director is defined as someone who has no material affiliation to the company, its chief executive officer, chairperson, or other executive officers, other than the board seat.

   Materiality is defined as any financial, personal, or other relationship that a reasonable person might conclude could potentially influence one's objectivity in a manner that would have a meaningful impact on the individual's ability to satisfy requisite fiduciary standards on behalf of investors. Directors may not be considered independent if they, or a family member, are or have been an employee of the company (or a subsidiary or affiliate thereof) in the last five years; have a 20 percent or greater economic interest in the company; are or have been part of an interlocking director relationship with the CEO; receive direct payments for professional services unrelated to their service as a director in excess of $10,000 per year; or engage in any related party transaction in excess of $10,000 per year.

2. **Board Leadership:** The board should be chaired by an independent director.

3. **Board Committees:** Each board should establish an audit committee, a nominating and governance committee, and a compensation committee, each composed exclusively of independent directors.

   Deference generally should be afforded to boards in determining appropriate oversight structures, such as the establishment and role of additional board committees. LACERA may support proposals to appoint an additional board committee in limited circumstances where a firm's performance, oversight structures, and peer comparisons demonstrate that inadequate board consideration and focus has been accorded to a compelling issue related to firm value.

LACERA may oppose or withhold support from non-independent board nominees or key board leadership positions where the board or key committees lack adequate independence.

B. Board Quality and Composition

1. **Composition:** The board should be composed of highly talented individuals who are best positioned to oversee the company's strategy for creating and sustaining value. Boards should give consideration to ensuring that directors collectively possess a diverse set of relevant skills, competencies, and attributes to exercise oversight on investors' behalf, including expertise, geographic familiarity, and professional backgrounds relevant to the company's strategic objectives. The board should strive for a suitable mix of tenures to ensure both institutional familiarity and fresh perspectives on the board, as a firm's market environment and business strategies evolve.

   The board should establish and disclose policies and processes for ensuring that it identifies and nominates suitable directors from a wide pool of candidates relevant to its business strategy, inclusive of ~~including~~, but not limited to, diverse gender, racial, and ethnic backgrounds, gender identities and sexual orientations. A diverse and inclusive board is better positioned to effectively deliberate and oversee business strategy in investors' interests.

   Firms should disclose how the board defines and reflects a relevant and diverse mix of skills and backgrounds in its composition. In assessing board composition, LACERA generally expects to see a compelling link between requisite skill sets and a firm's corporate strategy and a credible track record of inclusivity, including, but not limited to, gender diversity.

2. **Board Size:** The board should define and disclose in governance documents an appropriate size or range of directors that ensures the board is composed of adequately diverse viewpoints and experience to effectively oversee the firm's business strategy, while not being so large as to diminish the board's operational effectiveness. Modifications to governing documents defining board size and structure should be submitted for investor approval and not be proposed for the purpose of impeding a change in firm control.

3. **Excessive Commitments:** Directors should have adequate time to dedicate to their board service, fulfill their responsibilities, and represent investors' interests. Accordingly, directors should not serve on more than four public company boards. Currently serving chief executive officers should not serve on more than three public boards (including their own).

4. **Tenure and Age Restrictions:** LACERA does not support arbitrary restrictions on director qualifications, such as tenure limits or mandatory retirement ages. Such limitations may impede a firm from benefiting from the expertise of an otherwise highly qualified director.

C. Director Selection and Elections

1. **Annual Elections:** Each director should be elected annually. Directors should not be elected by classes, or to "staggered" terms.

2. **Vote Standard for Director Elections:** Director nominees in uncontested elections should be elected by a majority of votes cast. In contested director elections, a plurality of votes should determine the election.

3. **Universal Proxy Card:** In the event of a contested director election, investors should have the right to select and vote for individual director nominees on a

consolidated, or “universal,” proxy ballot, regardless of whether the director nominee is put forward by management or a dissident investor.

4. **Cumulative Voting:** LACERA supports cumulative voting in director elections, in compliance with California Government Code Section 6900.[1]

5. **Proxy Access:** Long-term investors who have held a significant ownership interest for a reasonable amount of time should have the right to nominate alternative directors for consideration on a firm’s proxy, otherwise known as “proxy access.” Proxy access procedures should have sound safeguards in place to ensure an orderly nominating process and prevent proxy access from being used to effectuate a change in control.

6. **Ability to Remove Directors:** Investors should have the right to remove directors with or without cause, in order to allow investors to take action when a director is not serving investors’ best interests.

D. Board Roles and Responsibilities

1. **Governance Guidance:** The board should develop, adopt, disclose, and periodically review clearly defined governance guidelines that govern the board’s operations.

2. **Resources:** The board should have adequate resources and access to information to enable it to execute its responsibilities and duties. Directors should be provided information in advance of meetings. Directors should have full access to senior management and information concerning the firm’s operations. Directors should be familiar with a firm’s operations independent of the chief executive officer and senior management. Directors should have the authority and adequate budget to hire outside experts, if necessary.

3. **Independent Proceedings:** Directors should work with the chief executive officer to establish board agendas. Independent directors should meet at least annually without management or non-independent directors’ participation.

4. **Board Communication and Engagement:** Firms should establish reasonable policies that permit effective communication between investors and directors regarding business strategy and corporate governance matters.

5. **Management Succession Planning:** The board should conduct a regular evaluation of the chief executive officer and plan for business continuity, including establishing and disclosing a succession plan for the chief executive officer and key senior executives.

6. **Board Self-Evaluation and Refreshment:** Boards should adopt and disclose a process for regular, rigorous, and earnest self-assessment and evaluation. The evaluation process should be conducted under the direction of independent directors and ensure candor, confidentiality, trust, and effective interaction among directors. Board self-evaluation should be tailored to meet the firm’s and board’s strategic objectives and requirements. In order to promote long-term

[1] Section 6900. Cumulative Voting. “Government Body.” Whenever any government body is a shareholder of any corporation, and a resolution is before the shareholders which will permit or authorize cumulative voting for directors, such government body shall vote its shares to permit or authorize cumulative voting. As used in this section, the term “government body” means the state, and any office, department, division, bureau, board, commission or agency thereof, and all counties, cities, districts, public authorities, public agencies and other political subdivisions or public corporations in the state.

planning aligned with business needs, the board's self-evaluation process should assess the board's size and operational effectiveness, identify emerging business risks and relevant skills gaps among its composition, and prudently anticipate and proactively plan for board vacancies and refreshment. It should appraise the alignment and adequacy of director education and development, as well as the delineation of management and board powers, while positioning the board to efficaciously exercise oversight in investors' interests.

7. **Charitable and Political Contributions:** Corporate charitable contributions may accrue direct and indirect benefits to a firm and its investors, including goodwill in communities in which it operates and favorable tax treatment. Charitable contributions should not be directed, eliminated, or otherwise restricted by investors.

   The board should monitor, assess, and approve all charitable and political contributions (including trade association contributions) made by the firm. Political and charitable contributions should be consistent with the interests of the firm and its investors. The board should clearly define and approve the terms and conditions by which corporate assets may be provided to charitable and political activities, including developing and publicly disclosing guidelines for the approval of such contributions. The board should disclose on an annual basis the amounts and recipients of all monetary and non-monetary contributions made by the firm during the previous fiscal year, including any expenditures earmarked for political or charitable activities that were provided to or through a third party.

8. **Director Indemnification:** Directors may be provided reasonable and limited protections, including indemnification and limited personal liability for damages resulting from violating duty of care, where the director is found to have acted in good faith and in a manner the director believed to be in the best interests of the firm. Reasonable limitations may ensure the board is positioned to recruit qualified directors.

E. Board Performance and Effectiveness

1. **Performance Evaluation:** The board's performance, and that of individual directors, should be assessed within the context of the board's suitability for and track record of serving and protecting investors' interests. LACERA may withhold support or oppose individual directors, members of a board committee, or the entire board where the track record demonstrates directors' failure to serve investors' best interests. Director and board performance is evaluated in consideration of the following factors:

   1.1. **Stewardship and Risk Oversight:** Directors should demonstrate a sound track record of stewardship and risk oversight, including avoiding any material failures of governance, risk oversight, or fiduciary responsibilities at the company. Risk is broadly understood to encompass financial, reputational, and operational risks relevant to a firm's ability to generate sustainable financial returns. Material risks may include, but are not limited to, internal controls related to legal compliance, cyber security, and data privacy, as well as broader risks addressed throughout these *Corporate Governance Principles*, such as risks associated with accounting practices, climate change, and human capital management.

1.2. **Effective Oversight of Management:** Directors should conduct effective oversight of management, including avoiding any failure to replace management as appropriate.

1.3. **Attendance:** Each director should attend at least 75 percent of scheduled board meetings each year, including attendance at assigned committees, absent a compelling, clearly disclosed justification.

1.4. **Board Service:** Directors' track records and performance on other boards may be considered in evaluating director nominees. In particular, a director's failure to effectively exercise oversight on other boards or any egregious actions that raise substantial doubt about the director's ability to fulfill a director's obligations and serve the best interests of investors may prompt opposition to the director's nomination.

1.5. **Ethics:** Directors should demonstrate the utmost integrity and be free of any criminal wrongdoing, breaches of fiduciary responsibilities, or questionable transactions with conflicts of interest.

1.6. **Transparency in Reporting:** Financial reports and material disclosures should be published in a satisfactorily diligent and timely manner.

1.7. **Investor Responsiveness:** Directors should demonstrate accountability and responsiveness to investors. Directors should not unilaterally amend a firm's governing documents in a manner that materially diminishes investor rights or otherwise adversely impacts investors without seeking investor approval. Directors should not adopt a poison pill or make a material change to an existing poison pill without submitting the plan for investor approval within the following 12 months. Directors should take reasonable steps to implement resolutions approved within the previous 12 months by a majority of investors, within the confines of legal and regulatory constraints. Directors should respond to tender offers where a majority of shares have been tendered. There should be no record of abuse against minority investor interests.

2. **Committee Performance:** Each committee should demonstrably fulfill its core duties and the specific responsibilities outlined in its committee charter. LACERA may oppose the committee chair or incumbent directors who have served on committees that have failed to perform their duties in investors' best interests. In cases where governance provisions, such as staggered board elections, impede LACERA from holding designated directors accountable, LACERA may oppose board leadership or other incumbent directors.

   Audit Committee members should ensure that non-audit fees are not excessive, no adverse opinion has been rendered on the company's audited financial statements, and the firm has not entered into an inappropriate indemnification agreement that limits legal recourse against the external auditor.

   Nominating and Governance Committee members should establish sound governance practices, reasonable and timely responsiveness to investors on governance concerns, and effective board nomination, evaluation, and refreshment practices.

   Compensation Committee members should demonstrate a clear and proven track record of aligning executive pay with the firm's strategic objectives and performance, refrain from permitting problematic pay practices, ensure clear disclosures of all key components of pay plan design and practices, and exhibit reasonable and timely responsiveness to investors.

3. **Contested Director Elections:** In assessing director nominees in contested elections, LACERA may consider all relevant factors to identify and support the nominees best suited to enhance sustainable firm value and serve investors' economic interests. Consideration may be given to the long-term financial performance of the firm, its governance profile, and management's track record; nominees' proposed strategies for value creation; the qualifications and suitability of director nominees, including their alignment with LACERA's governance principles; and the dissidents' ownership stake and history of generating sustainable returns at other firms.

   LACERA may support requests to reimburse dissident nominees for reasonable, incurred expenses when dissident nominees have presented a compelling case and support for their nomination is warranted.

II. Investor Rights and Capital Structure

Integrity and trust are the cornerstones of capital markets and essential for economic stability. Core investor rights ensure fair and equitable treatment of investors and help instill investor confidence, thereby facilitating capital formation and economic stability.

LACERA supports core rights and protections at portfolio companies and within financial market policies in order to safeguard its investments and foster a stable investment climate within the broader financial markets in which it invests. Financial rules and regulations should promote fair, orderly, and competitive markets and provide for investor protections. Investor rights extend to key decisions that may fundamentally impact or modify a firm's capital structure, such as share issuances, restructuring, and mergers and acquisitions.

A. Investor Rights

1. **Rights Proportionate to Economic Interest:** Investors should have voting rights proportionate to their economic interests. Multiclass ownership structures may entrench certain investors and management, insulating them from acting in the interests of all investors. LACERA therefore supports the principle of "one share, one vote."

2. **Voting Requirements and Procedures:** Investors should have the right to act on fundamental corporate matters by a simple majority of votes cast. Fundamental matters may include, but are not limited to, amending a firm's governing documents (such as its charter or bylaws) and effecting corporate transactions, such as a merger or acquisition.

   2.1 Simple Majority Voting: Companies should not adopt supermajority voting requirements except when such provisions may protect outside or minority investors from unilateral action being taken by an entity (or entities) with controlling interest or significant insider ownership.

   2.2 Voting Procedures: Voting and tabulation of matters put before investors by proxy or otherwise should be guided by transparent procedures, consistent application of rules, and fairness for all eligible voters. Votes should be counted by an independent tabulator and kept confidential. Voting results should be promptly disclosed once tabulation has been finalized.

   2.3 Bundled Voting: Investors should be able to review and cast votes on unrelated matters as separate and distinct ballot items. Disparate matters should not be presented for investor consideration as a "bundled" voting item. LACERA may oppose bundled proposals that combine supportable voting items with matters that LACERA opposes.

   2.4 Broker Non-Votes: Uninstructed broker votes and abstentions should be counted for quorum purposes only.

3. **Annual Meetings**

   3.1 Quorum Requirements: Quorum requirements should promote that a broad range of investors are represented at meetings. Quorum requirements should not be unduly low, in either absolute terms or relative to the economic interest of a controlling investor or significant investor, in order to protect investors from unrepresentative action being conducted.

3.2 **Technology:** Investors should have the right to attend an annual meeting of a firm in person. Any use of technology, such as audiocasts or webcasts, should expand and enhance, and not restrict or otherwise impede, investors' ability to participate in an annual meeting, and should afford opportunities for meeting participation equal to those afforded investors attending the meeting in person.

3.3 **Resolutions:** Investors with a reasonable ownership interest in a firm should have the right to put forward a resolution for investors' consideration and vote at the firm's annual meeting.

3.4 **Advance Notice Requirements:** Investors should be able to submit items for formal consideration at an annual meeting, such as proposals or director nominees, as close to the meeting date as reasonably possible and within the broadest timeframe possible, recognizing the need to allow sufficient notice for company, regulatory, and investor review.

3.5 **Transaction of Other Business:** LACERA generally opposes requests for advance approval by proxy of undisclosed business items that may come before an investor meeting for consideration.

4. **Special Meetings:** Investors should be able to call a special meeting to take action on certain matters that may occur between regularly scheduled annual meetings. The right to call a special meeting should require aggregating a minimum of 10 percent ownership interest and be subject to reasonable terms and conditions.

5. **Action by Written Consent:** Investors should have the right to act by written consent on key governance matters under reasonable terms and conditions.

6. **Access to Research:** Investors should have access to competitive, timely, and independent market, investment, and proxy research services of their choosing. Market regulation should support and not impede a competitive market of service providers.

7. **Ownership Disclosure:** Significant ownership interests above 5 percent should be disclosed.

8. **Incorporation:** A firm's country or state of incorporation may significantly impact the firm's financial health, competitive position, governance profile, and the legal rights afforded to investors, as defined by the jurisdiction of incorporation. When selecting a jurisdiction for incorporation (such as in relation to a merger or acquisition or a proposed reincorporation), firms should give due consideration to competitively positioning the firm for financial success while also ensuring sound governance practices and strong legal rights and protections for investors. LACERA may oppose proposals for reincorporation where the business and financial rationale for reincorporation do not outweigh the detrimental impact of a reincorporation on investor rights and governance provisions.

9. **Litigation Rights:** Robust and viable litigation rights enable investors to protect firm value, deter misconduct, and seek recourse in the event of egregious corporate malfeasance or fraud. Corporations should not curtail or otherwise diminish investors' prospective legal recourse through governance provisions, such as exclusive forum designations for legal disputes, mandatory arbitration

clauses, or "fee-shifting" provisions by which an investor who unsuccessfully brings legal action must bear the entirety of the corporation's legal costs.

B. Capital Structure

Finding the optimal mix of equity, long-term debt, and short-term financing is critical to driving economic returns. A firm's capital structure should support the generation of long-term, sustainable returns. The board should determine and drive a firm's capital structure, in coordination with senior management. Capital structure should coordinate and balance multiple factors, including the firm's business profile, strategy, and opportunities for growth; access to and cost of capital; and capital distributions such as the firm's dividend policy.

Investors should be able to vote on matters that may fundamentally modify or impact a firm's capital structure, such as common share issuances, and mergers and acquisitions.

1. **Share Issuances and Authorizations:** Share issuances enable firms to raise funds for financing purposes.

   1.1 Authorization of Common Shares Issuance: Requests to authorize capital or approve share issuances should specify the quantity of shares for which approval is sought. Requests should be evaluated upon careful consideration of the individual details and merits of each request and according to LACERA's economic interests. Firms should present a compelling purpose for the share issuance, demonstrate a track record of responsibly using authorized shares in investors' interests, and provide for rights and restrictions attached to proposed equity that are aligned with investors' interests. In evaluating requests, the availability of preemptive rights and any risks of authorizing the share issuance, including the dilutive impact of the request, may also be considered. Capital authorization terms should not facilitate an anti-takeover device or otherwise adversely impact investors' interests.

   1.2 Preemptive Rights: Preemptive rights provide current investors the right to maintain a proportionate interest in a firm by exercising a right to purchase shares proportionate to what they already own in any new issuances of equity. Requests to create or abolish preemptive rights should consider the size of the firm, the characteristics of its investor base, and the liquidity of its equity to ensure that preemptive rights may be pragmatically exercised and do not impose an onerous restriction on capital raising.

   1.3 Preferred Shares Authorization: Preferred shares, which provide distinct features such as fixed dividend payments or seniority of claims relative to common shares, may be supportable when the purpose of such issuance is in connection with a proposed transaction appearing on the same ballot that merits support. Otherwise, requests for authorization are evaluated in consideration of the request's stated purpose, the firm's past use of authorized preferred shares, and an assessment of the risk of authorizing the share issuance, including the dilutive impact of the request, and should not create or increase shares that carry superior voting rights to common shares. Any conversion rights should define reasonable conversion ratios and not result in excessive dilution of common shares.

   1.4 Blank Check Preferred Shares: Firms generally should not create classes of shares providing the board with broad discretion to define voting, conversion, dividend distribution, and other rights, absent a compelling rationale and clearly stated restrictions in line with investors' interests. The voting rights of unissued shares should be presented for investor approval and not be subject to board discretion.

1.5 **Blank Check Preferred Share Placements:** Investor approval should be required for the placement of preferred shares with any person or group for other than general corporate purposes to enable investor review of the business purpose, prospective impact on dilution and voting positions, and any adverse impact on existing investors.

1.6 **Reverse Stock Split:** Reverse stock splits, by which multiple shares are exchanged for a lesser amount to increase share price, generally should be accompanied by a proportionate reduction in authorized shares.

2. **Debt Issuance and Borrowing Powers:** Debt issuances and restructuring, amendments to a firm's aggregate limit on the board's ability to borrow money, and other debt-related items should serve a compelling and clearly articulated business purpose, be in line with and supportive of generating sustainable and viable financial returns, and take into reasonable consideration any detrimental impact on existing investors. LACERA evaluates debt-related proposals upon careful consideration of the individual terms and merits of the request.

3. **Capital Allocation and Income Distributions:** A firm should allocate capital, including distribution of income through dividends or share repurchases, in a disciplined and balanced manner that supports the generation of long-term value.

3.1 **Allocation of Income:** Firms should provide adequate justification when seeking investor approval for the allocation of income when the payout ratio appears unbalanced or unsustainable (either inordinately low, such as below 30 percent, or excessive, given the firm's financial position).

3.2 **Stock (Scrip) Dividend Policy:** Firms may provide investors the option to receive dividend payments in the form of common equity in lieu of cash. Such provisions enable a firm to retain cash and may strengthen the position and commitment of long-term investors. In all circumstances, firms should provide a cash option, absent a compelling justification that such an option may be harmful to investors.

3.3 **Share Repurchase Programs:** Open market share repurchase plans should enable investors to participate on equal terms and support balanced and disciplined capital allocation. Requests to authorize share repurchases should have a defined and limited duration, incorporate clear and reasonable terms and conditions, and generally not exceed 10 percent for market repurchases within any single authority, absent a compelling rationale in line with investors' interests and market practice.

4. **Mergers, Acquisitions, and Other Corporate Restructuring:** Mergers and corporate restructuring (including spin-offs, leveraged buyouts, and reorganizations) have major financial implications for investors.

4.1 **Evaluation:** LACERA carefully examines all relevant facts and circumstances of each proposal to determine whether the proposal, in its entirety, is in LACERA's best interests. Assessment of each proposed transaction takes into account multiple factors. The valuation should be reasonable. Market reaction may be considered. The strategic rationale and expected benefits should be sensible, with any projected synergies or financial impact reasonably achievable. Management should have a favorable track record of successful integration of acquisitions or business combinations. The negotiation and deal process should be fair and equitable. There should be no conflicts of interest, such as factors enabling insiders to disproportionately benefit from the proposed transaction. The resulting entity should observe sound corporate governance practices. The risks of not completing the transaction or corporate restructuring may be considered. Sufficient information should be provided to enable investors to make an informed decision.

4.2 Appraisal Rights: Investors should be afforded appraisal rights by which they may seek a judicial review of the terms of certain corporate transactions in order to determine fair market value.

5. **Anti-Takeover Measures:** Investors should be afforded the reasonable opportunity to deliberate and decide on the merits of takeover bids and acquisitions. Practices and provisions, including corporate bylaws, charters, laws, and statutes, that may impede or deter a corporate transaction that is otherwise in investors' interests, may take a variety of forms and generally should be submitted for investor review and approval.

5.1 Poison Pills: The board should not enact or amend a poison pill without investor approval. LACERA generally supports the redemption of existing poison pills, except in unique circumstances where a carefully designed, short-term plan may enable a firm to negotiate more favorable terms with a potential bidder. Such plans should require a minimum 20 percent ownership threshold to trigger, provide for limited and reasonable duration, exclude provisions by which only continuing directors may remove the pill, and otherwise provide adequate investor protections so that the plan will not unduly impede a bid that is otherwise in investors' interests.

5.2 Net Operating Loss (NOL) Protective Amendments: Protective amendments with the stated purpose of preserving a company's net operating losses for a tax benefit, such as under the terms of Section 382 of the Internal Revenue Code, should balance the anticipated benefit to investors of preserving the tax value and the risk of potential abuse of such provisions as an anti-takeover measure. Because NOL protective amendments may serve as a poison pill, the board should submit related items for investor review and approval. Such provisions should only be used under limited, clearly justified circumstances and include adequate protections, such as an appropriate ownership threshold and clearly defined and reasonable duration limits.

5.3 Greenmail: Greenmail, by which a firm repurchases shares of a potential acquirer at an above-market price to deter a takeover, should be prohibited.

5.4 Other Anti-Takeover Measures: LACERA generally opposes provisions that impose onerous restrictions or impediments on prospectively beneficial takeover bids, taking into account the specific terms and circumstances of such provisions to determine the provision's alignment with LACERA's economic interests. LACERA supports firms opting out of related anti-takeover laws and statutes, where legally permitted.

Fair price provisions that require an investor seeking to purchase control of a firm to pay a defined fair price should not impose onerous requirements that may deter a competitive bid from being considered by investors.

Firms should opt out of control share acquisition statutes that void the voting rights of an investor surpassing certain ownership thresholds; control share cash-out provisions requiring an investor above a specified ownership threshold to purchase shares from remaining investors at the highest acquiring price if remaining investors exercise their right to sell their shares; and freeze-out provisions requiring an investor who meets a defined ownership threshold to wait a specified period of time before gaining control of the firm.

Disgorgement provisions, by which an investor who acquires ownership interest above a specified threshold must pay the firm any profits realized from the sale of the firm's equity purchased within a defined time period prior to exceeding the defined ownership threshold, should be avoided.

Firms should not provide designated investors (such as the government of a related, formerly state-owned enterprise) "golden shares" that provide for exceptional veto power or voting rights regarding specific corporate proposals.

6. **Related-Party Transactions:** Investors should have the right to approve significant related-party transactions. Investor approval helps to protect investors against self-dealing. Firms should provide clear information regarding such transactions — including all fees, a compelling rationale for the service or services provided, and the assessment of independent directors and an independent financial advisor of the transactions — in order to permit an informed assessment of prospective conflicts of interest.

III. Compensation and Incentives

Compensation and incentives should align the interests of senior executives and investors. Executive compensation and incentives serve a critical role in recruiting, motivating, and retaining talent. Pay plan design, structure, and goals should be fundamentally derived from and relevant to a firm's core business objectives and collectively promote sustainable value creation. Accordingly, pay and incentives should incentivize and reward executives for the achievement of outstanding performance, while encompassing prudent risk mitigation and taking care to avoid excessive risks that may be detrimental to the firm's long-term financial returns.

Boards should determine core components of executive pay design, including target pay levels and incentives. Boards oversee compensation paid to senior executives, award bonuses, and establish incentive plans that may include equity and performance-based grants and awards. The board may also review and approve supplemental compensation plans for firm employees, including employee equity and retirement plans.

Firms should provide investors with transparent, clear, and comprehensive disclosure of senior executives' total compensation package. This includes disclosure of salary, short and long-term incentive compensation, and all benefits and perquisites. Selected performance metrics and targets upon which compensation is contingent should be provided in a plain and clear format.

A. Advisory Vote on Executive Compensation

Executive compensation design and practices should be submitted for investor review and non-binding approval on an annual basis (also known as "say on pay"). Advisory votes should consider the firm's pay design and practices as a whole, taking into account the alignment of executive pay with long-term firm performance, the absence of significant problematic pay practices and excessive risk in targets and reward incentives, and the clarity of the firm's pay disclosures.

B. Compensation Plan Design

Executive compensation and practices should link pay to firm performance. Compensation should be commensurate with the firm's long-term performance, appropriately aligned with firms with which the firm competes for executive talent (such as industry peers and firms of comparable size and profile), and properly consider the firm's long-term outlook for generating sustainable returns.

1. **Performance Criteria:** Incentive compensation should incorporate clearly defined, rigorous, and disclosed performance criteria upon which incentive pay is contingent. Performance metrics, targets, and hurdles should be consistent with and promote the firm's strategy for generating sustainable value, including key financial and operating objectives, and effective management of relevant business risks.

2. **Peer Benchmarking:** Peer groups used to benchmark compensation should be clearly disclosed and relevant to the firm's business profile and size.

3. **Compensation Consultants:** Compensation consultants providing strategy, design, and implementation services related to executive compensation to the board's compensation committees should be at the exclusive hire and service of the committee, unquestionably independent, and clearly disclosed.

4. **Equity Ownership, Retention, and Holding Requirements:** Equity ownership among senior executives may strengthen the alignment of interests between executives and investors and promote prudent risk mitigation, and should be encouraged. Equity ownership guidelines providing that executives should maintain reasonable equity in the firm, requirements for executives to retain a meaningful portion of equity acquired through compensation plans, and equity grant holding requirements should strike an appropriate balance to promote equity ownership while avoiding overly restrictive or onerous provisions that may undermine talent motivation and retention to the detriment of investors' interests.

5. **Prearranged Trading Plans:** Prearranged trading plans, as provided under Securities and Exchange Commission Rule 10b5-1, define parameters for executives' predetermined securities transactions in advance of an executive becoming aware of material non-public information regarding the firm's securities and are intended to mitigate the risks of insider trading. The adoption, amendment, or termination of prearranged trading plans for senior executives should be governed by the board, promptly disclosed, and provide for timely disclosure of transactions made pursuant to the plan's provisions.

6. **Hedging and Speculative Transactions:** Senior executives should be prohibited from engaging in derivative or speculative transactions involving equity of the firm, including hedging, holding equity in a margin account, or pledging equity as collateral for a loan.

7. **Internal Pay Disparity:** Executive compensation should be considered in the context of how a firm compensates its employees, including in relation to industry peers. Firms should disclose the ratio of the chief executive officer's total pay to that of the average firm employee.

8. **Restrictions:** Executive pay should not be subject to arbitrary restrictions or limitations on the magnitude or form of compensation, such as linking executive pay to average employee compensation. Arbitrary limits and restrictions may undermine a firm's ability to attract and retain competent talent and create a competitive disadvantage for the firm.

9. **Recoupment Policies:** Firms should adopt and disclose rigorous policies defining the terms and conditions by which incentive compensation may be recouped, in order to align pay with performance, promote accurate financial reporting, and deter misconduct. Robust clawback policies should enable the board to review and recoup senior executive incentive compensation in the event that compensation was calculated using inaccurate financial reports, or in the event of fraud or misconduct. Application of the recoupment policy should be reasonably disclosed.

10. **Perquisites:** Firms should refrain from providing executives with extraordinary or excessive perquisites that are not linked to firm performance, incongruent with prevailing best practices, and unjustified to adequately attract and retain executive talent. Corporate assets should not be unduly expended on personal expenses that are unrelated to an executive's employment and that extend beyond those widely offered to a firm's employees. Firms should avoid, or otherwise adequately and cogently justify, paying an executive's personal income tax obligations (including excise tax gross-up's), personal use of corporate aircraft, and extensive personal and home security payments.

C. Equity Plans

Equity plans should motivate plan participants to focus on long-term firm value and returns, encourage equity ownership, and advance the principle of aligning employee interests with those of investors.

Firms should submit equity plans for investor approval. Equity plans should be reviewed taking into account plan features, impact on equity dilution, and prospects to align pay with performance.

1. **Performance-Based:** Equity plans should define robust and appropriate performance requirements by which equity may be granted that are aligned with and justifiable by the firm's business strategy and strategic objectives. Such provisions may include terms and performance criteria permitting a plan to qualify for favorable tax treatment.

2. **Track Record:** The firm should demonstrate a history of responsibly linking equity awards to performance and avoiding grants of excessive awards.

3. **Impact:** The total cost and potential dilution of the plan should be reasonable.

4. **Repricing:** Equity granted under the terms of the plan, such as share options and stock appreciation rights, should not be repriced without investor approval, as repricing may sever the link between pay and performance. Requests to reprice underwater options should clearly define and compellingly justify the rationale and intent, timing, defined participants, and terms, such as a value-for-value exchange, exercise price, and vesting requirements.

D. Employee Equity Programs

1. **Employee Stock Purchase Plans:** Employee stock purchase plans encourage firm employees to acquire an ownership stake in the firms for which they work by providing employees the right to purchase the firm's equity at a set price within a certain period of time. Employee stock purchase plans should define reasonable terms, such as designating exercise prices at no lower than 85 percent of fair market value, fixing a justifiable offering period, and limiting voting power dilution to less than 10 percent.

2. **Employee Stock Ownership Plans:** Employee stock ownership plans (ESOPs) enable employees to accumulate firm equity. ESOPs should balance encouraging employee equity ownership while avoiding harm to existing investors. Shares allocated to ESOPs should not be excessive (generally no more than 5 percent of outstanding shares).

E. Severance and Retirement Arrangements

Severance payments to executives in the event of an employment termination, separation, or change in firm control should be justifiable by the executive's performance, serve the long-term interests of the firm and its investors, and not be excessive.

1. **Golden Parachutes:** Firms should submit for investor approval arrangements to provide executives with extraordinary severance payments in certain circumstances, such as a change in firm control. Extraordinary payments may be assessed in relation to market and peer practice and should not exceed payments greater than three times base salary and bonus. Severance payments should not be so attractive as to influence merger agreements that may not be in

the best interests of investors and should have triggering mechanisms beyond the control of senior executives. Any payments in the event of a change in control should be "double triggered," i.e., contingent upon both an actual change in control and an employment separation related to the change-in-control event. Unvested equity should not accelerate upon the change in control. Payments should not trigger, and firms should not commit to paying, executives' excise taxes ("gross ups"). A change in control should not be contingent upon investor approval of executives' severance payments.

2. **Supplemental Executive Retirement Plans:** Retirement plans that provide extraordinary retirement benefits exclusive to executives should be presented for investor approval and avoid excessive payouts, such as excluding all incentive or bonus pay from covered compensation calculations.

3. **Golden Coffins:** Firms should refrain from providing extraordinary compensation upon an executive's death. Firms should submit for investor approval agreements and policies that oblige the firm to make payments or awards following the death of a senior executive, including unearned salary or bonuses, accelerated vesting or continuation in force of unvested equity grants, and other extraordinary payments or awards.

F. Director Compensation

Firms should disclose the philosophy and process used for determining compensation paid to directors serving on the board and the value of all elements of director compensation.

1. **Structure and Design of Director Compensation:** Directors may be compensated in both cash and equity. Fees and compensation paid to directors should be appropriate relevant to market norms, the firm's industry, and its financial performance. Equity should not constitute the entirety of director compensation, as this may undermine directors' incentive to monitor and exercise oversight of long-term risks to firm value.

2. **Equity Ownership:** Equity ownership by directors promotes the alignment of directors' interests with those of investors. Firms should adopt and disclose equity ownership guidelines to encourage directors to acquire and hold a meaningful amount of equity in the firm. Equity ownership should not, however, be a qualification for board service, as such restrictions may impede otherwise highly qualified individuals from serving as directors.

3. **Retirement Benefits:** Retirement benefits for director service are improper, as such benefits may impede objectivity and sever the alignment of interest between directors and investors.

IV. Performance Reporting

Financial markets work most efficiently when investors have timely, reliable, and comparable information about material aspects of a firm's performance. Transparency of a firm's key financial and operating performance is critical for investors to assess the firm's financial viability and prospects. Independent verification of a firm's financial disclosures promotes investor confidence.

LACERA supports clear and comprehensive disclosure of relevant financial and operating performance indicators (including environmental, social, and governance matters) that may provide valuable information for investors to assess a firm's prospects for delivering sustainable value.

A. Financial Reports

Financial statements and auditor reports are essential in evaluating a firm's performance. Financial reports should present clear, reliable, and comprehensive data and information. A firm's overall performance reporting framework should conform with, and place primary prominence on, established accounting standards. Additional reporting measures that do not adhere to generally accepted accounting principles (either GAAP or International Financial Reporting Standards/ IFRS, depending on the reporting market) should be clearly explained and justified, and should supplement, as opposed to replace or otherwise obfuscate, performance reporting that is consistent with established accounting standards.

When presenting financial reports for investor review, there should be no unresolved concerns about the accounts presented or audit procedures, inadequate disclosures, or unresponsiveness regarding investor or regulatory questions on specific items.

B. Fiscal Term

Firms should define an appropriate fiscal term. The fiscal term should not be altered for the purpose of postponing an annual meeting.

C. Auditors

Firms should ensure independent, high-quality, and timely provision of audited financial statements by a clearly disclosed external auditing firm.

1. **Ratification:** Auditors should be clearly disclosed and presented to investors for ratification. LACERA takes into consideration the following factors when evaluating auditor ratification:

    1.1. **Independence:** The external auditor should be objective and free of conflicts of interest in providing auditing services. Accordingly, non-audit fees paid to an external auditor should not be excessive. Specifically, non-audit fees should not exceed the total of audit and audit-related (such as permissible tax) fees, and the auditing firm should have no financial interest or association with the company.

    1.2. **Quality:** There should be no question as to the accuracy of the external auditor's opinion, the financial report's indication of the company's financial position, and the accurate application of established accounting standards. There should be no aggressive accounting practices or significant audit-related issues at the company, such as a history of restated financial results or material weaknesses in internal controls.

    1.3. **Timeliness:** There should be no unjustified delays in the publication of audited financial statements.

2. **Rotation:** Requests to rotate auditors should be evaluated in consideration of the audit firm's tenure, any proposed length of rotation, the presence of significant audit-related issues at the company, the extent to which the company periodically assesses audit

pricing and quality, and the robustness of the audit committee's functions, such as the presence of financial experts and how often the committee meets.

3. **Indemnification:** To avoid any impairment of the external auditor's objectivity and independence, companies should not enter into engagement letters that indemnify or otherwise limit the external auditor's liability.

V. Environmental and Social Factors

Environmental and social factors — such as management of human capital, access to natural resources, and environmental risks — may shape and impact a firm's ability to generate and sustain value. Firms should identify and prudently manage social and environmental factors relevant to the firm's business strategy, industry, and geographic markets. Social and environmental factors may present opportunities to drive value or risks to a firm's strategic objectives.

Firms should ensure diligent board oversight and provide reasonable disclosures of relevant environmental and social factors and how they are managed. Reporting enables investors to make informed investment decisions when evaluating companies and the long-term viability and sustainability of their business practices.

In addition to identifying, evaluating, and mitigating the risks presented by social and environmental factors, firms should carefully consider the impact of their business activities. Promotion, adoption, and effective implementation of guidelines for the responsible conduct of business and business relationships are consistent with the fiduciary responsibility of protecting long-term investment interests.

A. Social Factors

1. **Human Capital Management:** Effective management of human capital — including the development, incentives, and retention of the firm's workforce — is key to accomplishing a firm's strategic objectives. Companies should identify, ensure board oversight, and disclose information about significant human capital value drivers that are related to the firm's ability to create and protect firm value. Central to effective human capital management is the assurance of equal employment opportunity, including non-bias in compensation and employment terms, and a workplace free of harassment in all forms.

2. **Human Rights Risk:** Firms should mitigate the risks of human rights abuses in global operations and supply chains by adopting robust human rights policies and ensuring effective internal controls to monitor compliance with stated human rights standards.

B. Environmental Factors

1. **Natural Resource Stewardship:** Firms should give consideration to efficient, sustainable use and stewardship of natural resources, such as energy and water, to enhance operational efficiency and safeguard firm value from the risks of resource scarcity.

2. **Environmental Risk:** Firms should ensure reasonable oversight mechanisms and mitigation of environmental risks, such as hazardous waste disposal and pollution, to mitigate prospective legal, regulatory, and operational risks to firm value.

3. **Climate Risk:** Climate change may present financial, operational, and regulatory risks to a firm's ability to generate sustainable value, as well as to the broader economy. Firms should assess and disclose material climate-related risks and sufficient, non-proprietary information to enable investors to prudently and adequately evaluate the prospective impact of climate risk on firm value.

Responsibilities and Delegations

A. The Board of Investments:

(i.) Approves and promulgates policies addressing environmental, social, and governance issues, such as corporate governance and proxy voting matters and including but not limited to the *Corporate Governance and Stewardship Principles* ~~and this *Corporate Governance Policy*~~, as recommended by the Corporate Governance Committee of the Board.

(ii.) Receives periodic reports concerning the program's progress and priorities from the Corporate Governance Committee.

(iii.) Approves LACERA representatives for nomination to governing bodies of the corporate governance associations to which LACERA is affiliated, as recommended by the Corporate Governance Committee.

(iv.) Approves procedures to comply with legislated or other mandated divestment or investment exclusions, such as LACERA's *Procedures for Evaluating ESG-Related Divestments* (Appendix A), as developed and recommended by the Corporate Governance Committee.

B. The Corporate Governance Committee of the Board of Investments:

(i.) Recommends the *Corporate Governance and Stewardship Principles*~~, the *Corporate Governance Policy*,~~ and other items concerning environmental, social, and governance matters to the Board of Investments for consideration and approval.

(ii.) Exercises oversight and monitoring of the corporate governance program, including reviewing program priorities and progress.

(iii.) Reviews reports regarding proxy voting results and trends and develops recommendations for Board approval for any policy recommendations, as appropriate.

(iv.) Reviews and ensures alignment of strategic initiatives with the *Corporate Governance and Stewardship Principles.*

(v.) Provides periodic reports on the program to the Board of Investments.

(vi.) Delegates authority to the Committee Chair to determine LACERA's action on time-sensitive, investment- or financial market-related legislative or regulatory matters that are not adequately addressed in the *Corporate Governance Principles* or joint investor engagements affiliated with investor associations to which LACERA has formally affiliated.

(vii.) Recommends for Board of Investment approval, LACERA representatives for nomination to governing bodies of the corporate governance associations to which LACERA is affiliated. In event the Committee is not scheduled to meet or lacks adequate time to recommend a nomination to the Board prior to a formal deadline, the Committee delegates authority to the Committee Chair to recommend consideration of the nomination by the Board.

(viii.) Recommends for Board of Investment approval, time-permitting, LACERA's votes in support or opposition of candidates listed on a formal member ballot and nominated to a governing board of an investor association to which LACERA has formally affiliated. In event the Committee is not scheduled to meet or lacks adequate time to agendize under the Brown Act an informed recommendation to the Board for vote determinations prior to a formal deadline, the Committee delegates authority to the Committee Chair to recommend consideration by the Board, time-permitting, of the votes in support or opposition of board candidates. In time-sensitive circumstances where vote deadlines do not permit such vote considerations by the Committee or the Board, the Committee delegates authority to the Committee Chair to consult with staff per Section V(C)(vi.) below on votes.

C. Staff

(i.) Develops and recommends *Corporate Governance and Stewardship Principles* and related policies for review and consideration by the Corporate Governance Committee.

(ii.) Executes proxy votes in adherence to the *Corporate Governance and Stewardship Principles*. Staff consults with and seeks the input of the Chief Investment Officer and Chief Counsel, when applicable, to apply the *Corporate Governance and Stewardship Principles*, and the spirit thereof, to unique or new proxy voting items in their best judgment and interpretation of the *Corporate Governance and Stewardship Principles*. Staff recalls shares of loaned securities when doing so is in LACERA's economic interests, such as at portfolio companies where LACERA has sponsored a shareowner proposal.

(iii.) Communicates and represents the *Corporate Governance and Stewardship Principles* in dialogues and communication with portfolio companies, external asset managers and investment partners, other investors and stakeholders, related conferences, and other interested parties.

(iv.) Presents any strategic plans for engagement to the Corporate Governance Committee, per the Committee's review and oversight, to promote alignment with Board-approved *Corporate Governance and Stewardship Principles*. In the event of time-sensitive strategic initiatives, staff consults with the Chair of the Committee, who determines action or recommends consideration of the matter by the Committee or Board, time-permitting.

(v.) Represents the *Corporate Governance and Stewardship Principles* in written communication to legislators and regulatory agencies, in consultation with the Chief Executive Officer, Chief Investment Officer, and Chief Counsel. Staff may participate in joint investor written communications that are organized as part of formal investor associations to which LACERA has formally affiliated. In event that a time-sensitive, investment- or financial market policy-related legislative or regulatory matter arises that is not adequately considered by the *Corporate Governance and Stewardship Principles* or being addressed by an investor association to which LACERA is affiliated, staff consults with the Chair of the Committee, who determines whether to approve action or recommend consideration of the matter by the Board, time-permitting.

(vi.) Represents LACERA and its *Corporate Governance and Stewardship Principles* at investor associations, including managing membership surveys, business meeting votes (other than selecting which candidates to a governing board to support or oppose), and other operational interactions, in adherence to the *Corporate Governance and Stewardship Principles* and the spirit thereof, in its best judgment and interpretation. In event that a time-sensitive vote arises on a unique item or an issue that is not adequately considered by the *Corporate Governance and Stewardship Principles*, as well as for governance-related investor associations' formal business meeting ballot items pertaining to support or opposition of candidates to a governing board, and time constraints prohibit such items from being presented to the Committee or Board for consideration, staff may determine a vote in consultation with the Chair of the Committee.

~~Regular~~ Policy Review and Reaffirmation

LACERA reviews and reaffirms this Policy at least every three years in order to ensure its alignment with LACERA's mission and objectives and in light of evolving market practices on corporate governance; environmental, social, and governance ("ESG"); and responsible investment matters.

APPENDIX A: Guidelines ~~Procedures~~for Evaluating Prospective ESG-Related Divestments

As stated in LACERA's *Investment Beliefs*, "LACERA operates in a global financial marketplace, and as such, LACERA believes that in order to diversify its risk broadly, it is vital that LACERA possess a global perspective. Diversification across different risk factors is necessary for risk reduction."

As a diversified, global investor, LACERA ~~is~~ may periodically ~~requested to~~ review its public markets investment exposures to certain issues arising from environmental, social, or governance concerns. It is generally the preference of LACERA, in order to promote diversification and minimize risk, to engage rather than divest investment holdings concerning risks to long-term value. However, in order to address prospective divestment issues and identify LACERA's exposure to exogenous risks related to environmental, social, or governance issues and not addressed elsewhere in the *Investment Policy Statement*, the following formal process has been adopted:

1. The issue will be directed to Committee for further direction to Staff.

2. If the Committee decides to review the issue, Staff will assess the potential economic and reputational impact of the issue on LACERA.
    a. Does the issue violate LACERA's *Corporate Governance and Stewardship Principles*?
    b. Determine criteria for identification of investment(s).
    c. Preliminary identification of the investment.
    d. Preliminary estimate on size of the investment.
    e. Seriousness of the issue/violation and whether it impacts the economics of the investment(s).
    f. Consultation with LACERA's Chief Executive Officer, Chief Investment Officer, and legal counsel.

3. Staff will report its findings on the potential economic and reputational impact of the issue on LACERA to the Committee.

4. The Committee may forward the issue and potential economic and reputational impact on LACERA to the Board of Investments (Board) for further direction.

5. If the Board directs staff to continue the analysis, staff will calculate the anticipated resources involved in analyzing the issue including, but not limited to:
    a. Estimate of staff hours required for research and analysis.
    b. Estimate of the resource impact on current staff initiatives and projects (for example the delay in an RFP search).
    c. Estimate of cost to obtain information (e.g.: company list) from external service provider.

6. Staff will report back to the Committee with its resource requirements analysis.

7. Committee may make recommendation to the Board to pursue additional analysis.

8. Upon receiving direction from the Board, Staff will contract with external data provider to identify investment(s) impacted by the issue.

9. Staff will identify investment exposures within the separate accounts of the public markets asset classes (equities, fixed income and commodities).

10. Staff will contact external investment managers to solicit feedback from portfolio managers on reasoning for the investment and potential return and risk trade-off of economic substitution.

11. Staff will present findings to the Board and any recommendation(s) as necessary. If further action is warranted, such as engagement with companies, staff's report to the Board will include the following:

a. An estimate of additional staff hours needed to execute engagement.
b. An estimate of the impact of diverting resources from current staff initiatives and projects (for example the delay in an RFP search).
c. Cost of retaining external resources (3rd party consultant) to assist in the engagement process.
d. Feedback from portfolio managers on their investment in the company.
e. Discussion of criteria and terms for company engagement.

12. If further action, such as engagement, is recommended and approved by the Board, staff will seek to engage with companies on the issue. Letters will be written to the company's executive management and their boards requesting responses within 60 days.

13. If company response is determined to be insufficient, staff will assess the need to place the company on an economic substitution list[2] and present recommendation(s) to the Board for approval. Included in the recommendation(s) will be the following:
    a. Updated company exposure within separate accounts of public markets asset classes.
    b. Annual cost to procure company list.
    c. Criteria by which company will be removed from the economic substitution list.

14. Staff will continuously monitor company status relative to criteria for removal from the economic substitution list. Once criteria have been met, staff will recommend removal of the company to the Board.

15. Staff will provide an economic substitution list update to the Board annually which will include the following:
    a. All companies currently on the list.
    b. Issue for which the company was placed on the list.
    c. Investment exposure within separate accounts of public markets asset classes.
    d. Current status of mitigating factors.

Revised and Reviewed: August 9, 2017
Reviewed: October 12, 2016
Revised: November 19, 2014

[2] Companies on the list will be covered by the following investment guideline policy language: "Investment managers should refrain from purchasing securities on the economic substitution list when the same investment goals concerning risk, return, and diversification can be achieved through the purchase of another security."

Document History

Consolidated and restated _______ 2020
Revised March 13, 2019
Consolidated, reorganized, and adopted by the Board of Investments on February 14, 2018.
Revisions adopted by the Board of Investments on August 9, 2017.
Reviewed by the Board of Investments on October 12, 2016.
Reviewed by the Board of Investments on November 19, 2014.
Revisions adopted by the Board of Investments on April 10, 2013.
Revisions adopted by the Board of Investments on April 22, 2009.
Revisions adopted by the Board of Investments on April 27, 2005.
Revisions adopted by the Board of Investments on May 26, 2004.
Revisions adopted by the Board of Investments on August 13, 2003.
Revisions adopted by the Board of Investments on June 11, 2003.
Original adopted by the Board of Investments on March 12, 2003.

September 30, 2020

TO: Each Trustee
Board of Investments

FROM: Jude Perez
Principal Investment Officer

Scott Zdrazil
Senior Investment Officer

Dale Johnson
Investment Officer

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: **Evaluating a Climate-Aware Strategic Asset Allocation**

The attached presentation is intended to frame a discussion with the Board of Investments ("Board") on analytical approaches to inform the Board's assessment of a strategic asset allocation that might consider financial risks and opportunities related to climate change. The presentation follows LACERA's 2020 Workplan, discussed at the Board's January 2020 meeting, regarding considering the impact of climate change on forward-looking risk and return analysis. More details and descriptions are in the attached deck (**Attachment**).

Attachment

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

ATTACHMENT

Evaluating a "Climate-Aware" Strategic Asset Allocation

Board of Investments
October 14, 2020

Scott Zdrazil, Senior Investment Officer
Dale Johnson, Investment Officer
Sarah Bernstein, Meketa Investment Group
Stephen MacLellan, Meketa Investment Group

LOS ANGELES COUNTY EMPLOYEES RETIREMENT ASSOCIATION

Discussion Outline

Objectives and Background

Analytic Approaches to Evaluate Climate Risks and Opportunities

1. Carbon Footprinting
2. Portfolio Scenario Analysis
3. Stress Testing and Capital Market Assumptions

Implications for Strategic Asset Allocation Study/Market Assumptions

Objectives and Background

Objective

LACERA's "Vision 2020" Strategic Objectives and Workplan* includes:

➢ ***Evaluate a "climate aware" strategic asset allocation***

August 2020 Board Off-site Discussed Strategic Asset Allocation Considerations

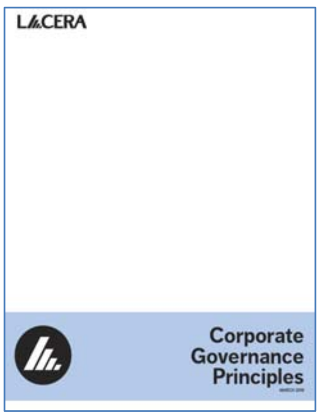
- SAA models use past performance to predict future outcomes
- Challenges of taking into account forward-looking, exogenous tail risks (e.g. pandemics, geopolitical/election risks, climate change, etc.)

What is a "climate aware" strategic asset allocation?

Evolve with improving and expanding data tools, policy changes, innovation

* Presented and discussed at the January 2020 meeting of the Board of Investments as part of strategic asset allocation planning

LACERA Policy Regarding Climate Change

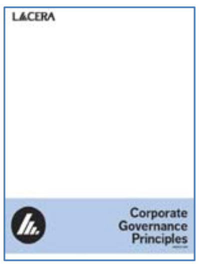


LACERA's *Corporate Governance Principles* recognize climate change as a material financial risk to LACERA portfolio holdings and to the broader economy in which LACERA is investing. LACERA therefore supports prudent assessment and disclosure of risks by firms:

> **"Climate change may present financial, operational, and regulatory risks to a firm's ability to generate sustainable value, as well as to the broader economy."**
>
> **"Firms should assess and disclose material climate-related risks and sufficient, non-proprietary information to enable investors to prudently and adequately evaluate the prospective impact of climate risk on firm value."**
>
> *(Principles, §V(B)3, p.19)*

LACERA adopted the above policy position in 2017 following an educational series hosted by the Board of Investments Corporate Governance Committee on ESG featuring leading experts from service providers, asset managers, asset owners, and industry associations.

Translating Policy into Action



Since its policy adoption in 2017, LACERA has taken action:

- ✓ Joined global investor engagements to mitigate climate risks
- ✓ Advocated public policy to achieve the Paris Agreement
- ✓ Evaluated external managers on how they evaluate climate risk
- ✓ Started to integrate data tools to evaluate portfolio climate risks

TIMELINE

2018
- Established engagement priorities, including advocating reliable corporate reporting of climate risks
- Joined the **Climate Action 100+** to call on carbon intensive companies to mitigate climate risks
- Signed **Global Investor Statement on Climate Change** urging governments to achieve Paris Agreement
- Surveyed public markets managers on ESG practices, including climate risk

2019
- Endorsed the **Task Force on Climate-related Financial Disclosures**, an industry led effort outlining a four-part approach for companies to address climate risks in their business operations
- Joined **Sustainability Accounting Standards Board** Advisory Group – most common standard is climate
- Started engaging private market managers on ESG incorporation practices, including climate risk
- Discussed scenario analysis tools with Corporate Governance Committee and launched data tool RFP

2020
- Started onboarding climate-related portfolio analytical tools from new vendors

Building Action from Principles

ESG integration builds from defined principles and policies

Portfolio Total Fund View

Integrate ESG into Total Fund view for monitoring and enhanced decision-making

- ✓ Develop “climate-aware” strategic asset allocation
- ✓ Incorporate ESG data analytics into Total Fund risk and performance analysis

Practices and Procedures

Put principles into practice in adherence with approved policies

- ✓ Proxy voting in support of climate risk assessment and disclosure
- ✓ Climate Action 100+ global investor corporate engagement initiative
- ✓ Global Investor Statement to Governments on Climate Change
- ✓ Sustainable Accounting Standards Board for consistent reporting

Principles and Policy

Defined principles and overarching policy framework guided by fiduciary duty

- ✓ *Investment Policy Statement (ESG in Investment Beliefs, Philosophy, and Strategy)*
- ✓ *Corporate Governance Principles* articulate fund position on climate risks

Overview of Three Key Analytical Approaches

To inform the Board's evaluation of a "climate aware" strategic asset allocation, today's presentation previews three analytical tools

Carbon Footprinting

Measures emissions generated by investments

Provides baseline for portfolio climate analytics

Backward-looking analysis

Bottom-up analysis

Scenario Analysis

Evaluate prospective financial impacts under various policy and climate change scenarios

Forward-looking analysis

Bottom-up or top-down analysis

Stress Testing in Capital Market Assumptions

"Shocks" capital market assumptions using climate-related policy and climate assumptions

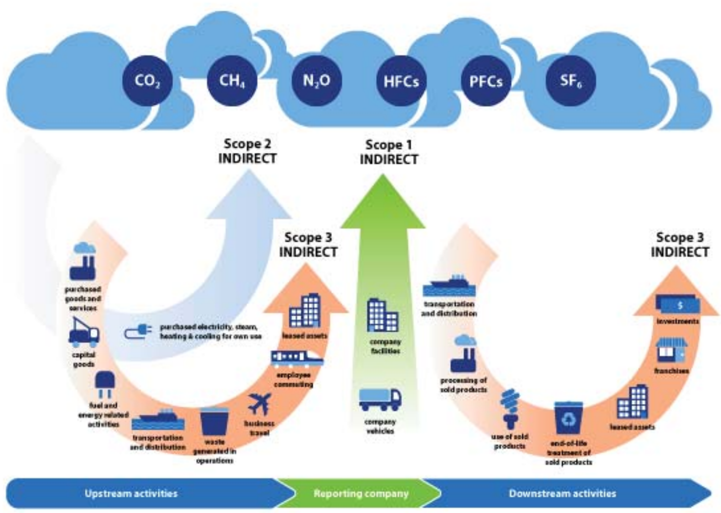
Forward-looking analysis

Top-down analysis

1. Carbon Footprinting

What Is Carbon Footprinting CO_2

Carbon footprinting measures carbon emissions generated by a portfolio



Three categories of emissions

Scope 1 emissions are from sources that are owned or controlled by the company

Scope 2 are generated in the production of electricity consumed by the company

Scope 3 include all supply chain emissions and emissions generated from the use of a product or service following its sale by the company

Why perform a carbon footprint?

- Identifies concentrated exposures
- Sets baseline for forecasting (scenario analysis)
- Identifies risks for potential asset revaluation
- Can inform corporate engagement
- Can inform external manager monitoring

What are challenges associated with carbon footprinting?

- Point in time measurement; backward-looking
- Incomplete corporate disclosures; requires modelling
- Difficult to apportion emissions for indirect ownership
- Emerging standards for measuring Scope 3 emissions
- Risk of double counting, e.g. supply chain, utility power

Equity Portfolio Relatively Even with Benchmark

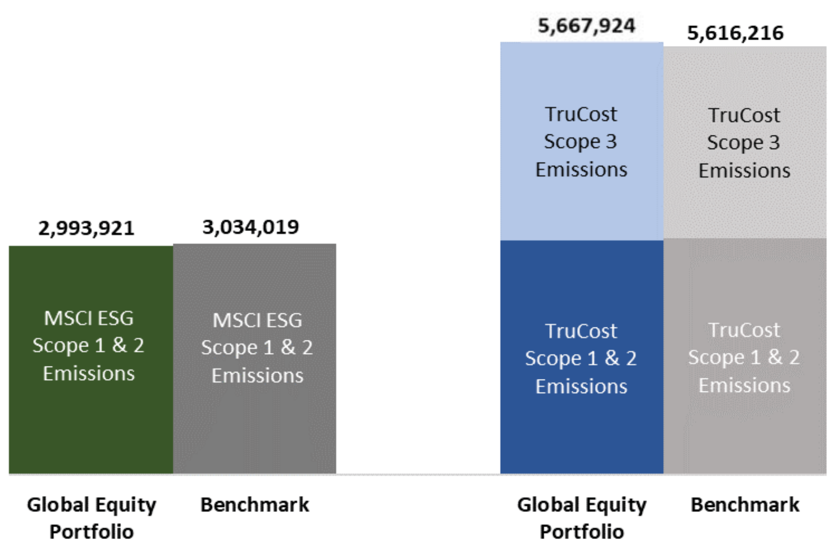
Global equity can be used as a proxy for broader investible universe due to global, diversified composition

Equity portfolio carbon footprint relatively even MSCI ACWI IMI Index

Analysis utilizing two data vendors reveals similar results

Incorporating Scope 3 emissions significantly increases exposures

Global Equity Portfolio Carbon Emissions (tCO_2)



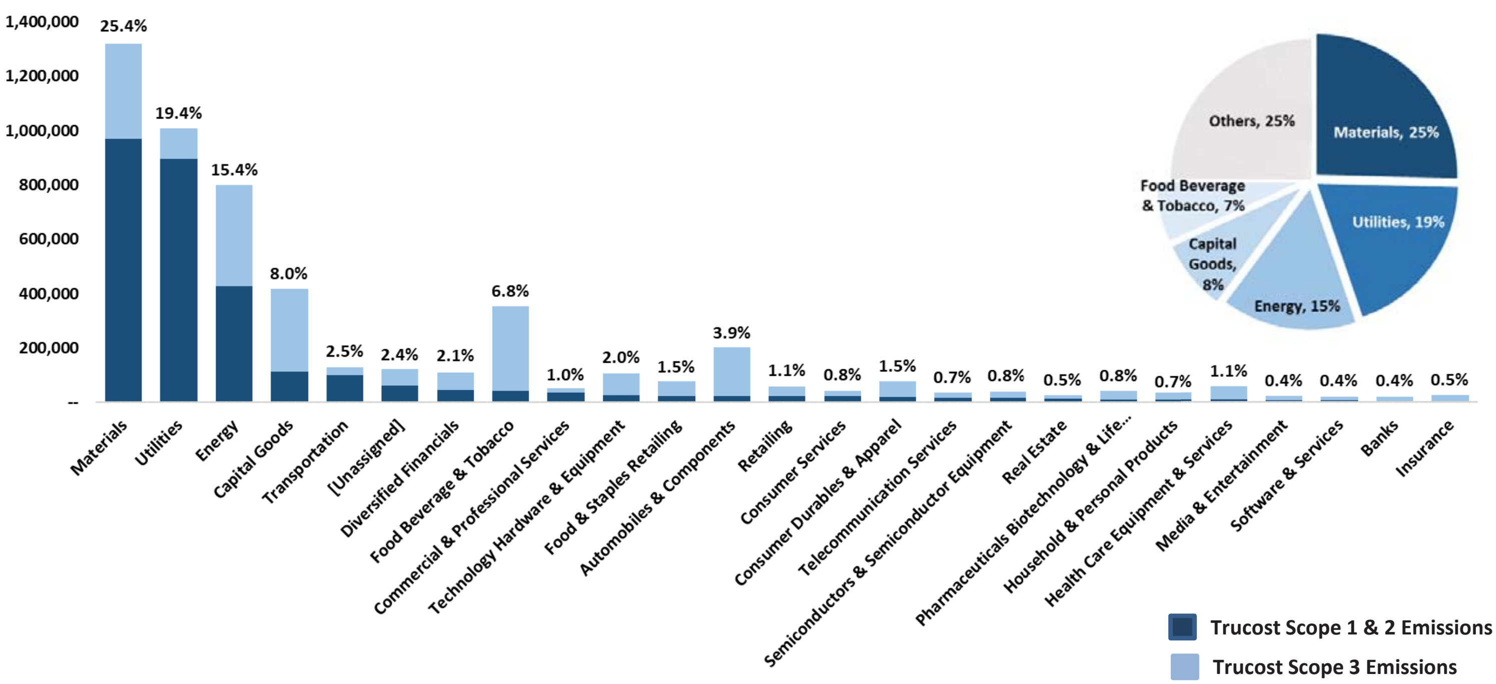
Benchmark = MSCI All Country World Index Investible Market Index

Sources: MSCI and S&P Trucost

Key Sectors Drive Exposures

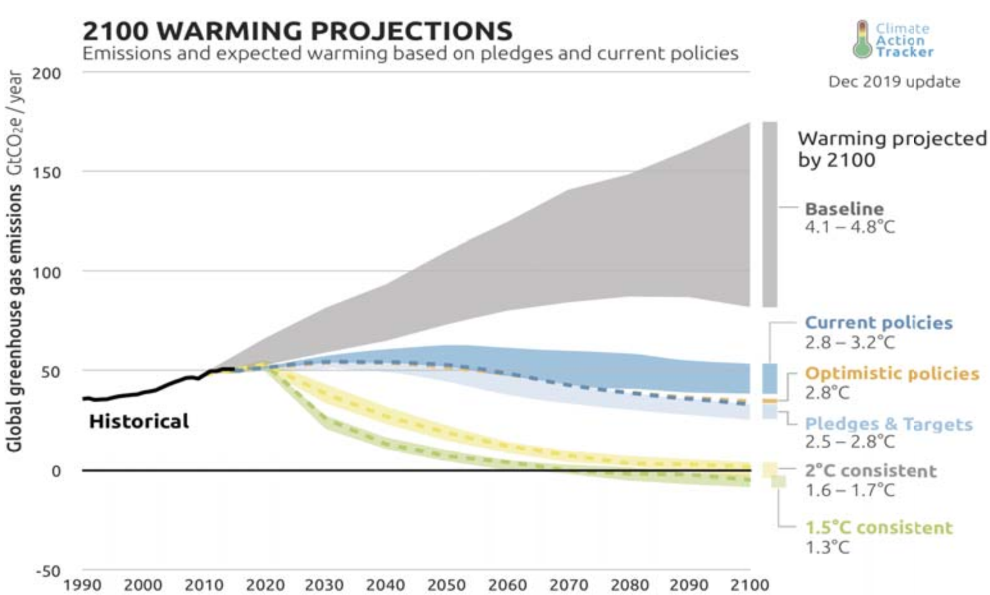
Three key sectors (Materials, Utilities, and Energy) account for about **60%** of total emissions

Breakdown of LACERA Equity Portfolio Carbon Footprint (tCO_2) By Industry Group



2. Climate Scenario Analysis

Prospective Pathways for Policy and Physical Change



Simplified Characterization of Prospective Pathways Shaping Risk/Return Analysis

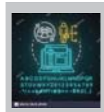
1. No policy change forecast to lead to estimated 4.1.-4.8˚C change and resultant economic costs

2. Cohesive policy responses achieving Paris Agreement (i.e. below 2˚C scenarios) re-prices risk and opportunities across industries, geographies, investment horizons, etc.

3. Fragmented, evolving policy/industry responses re-shape financial risk and opportunity

Policy Risk
Changes to the regulatory framework that could prompt a reassessment of the value of a large range of assets as costs and opportunities become apparent (e.g. 2 degree scenario policies; carbon tax; cap-and-trade)

Physical Risk
The impact on the value of financial assets and insurance liabilities that arise from acute or chronic climate-related events that damage property or disrupt trade (e.g. storms, drought, crop yields, flood zones, power supply demand)

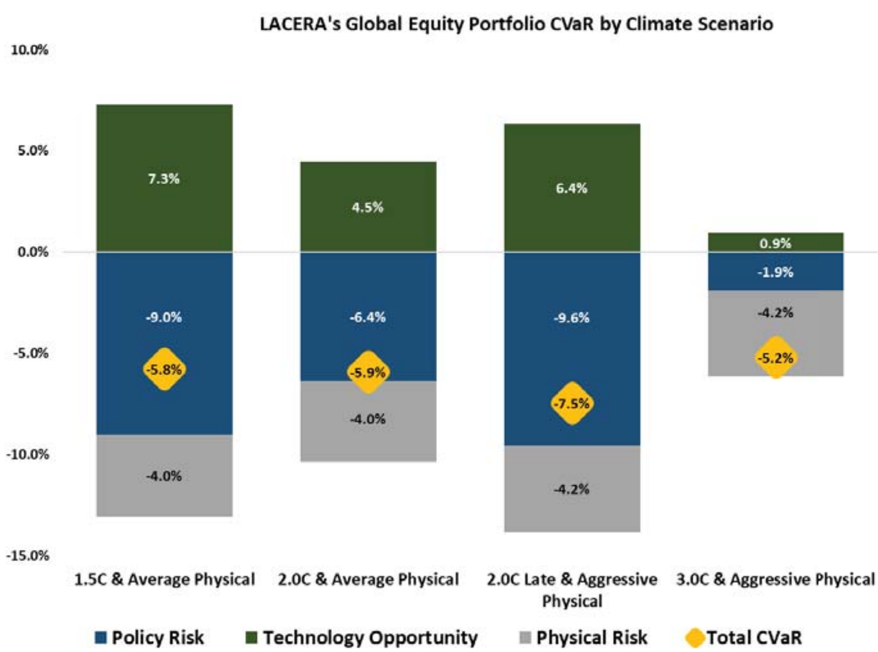


Technology Opportunity
Changes in technology resulting from the process of adjustment towards a lower-carbon economy that could prompt reassessment of the value of the assets

Source: Climate Action Tracker. https://climateactiontracker.org/global/temperatures/. Downloaded September 2020.

Prospective Pathways and Financial Exposures

Each scenario foresees a prospective aggregate financial risk to the diversified equity portfolio from physical risk, policy risk, and technological opportunity



MSCI CarbonDelta **Climate Value At Risk "CVaR"** varies by scenario

- Immediate policy changes imply larger negative policy impact, but also greater positive technology opportunity
- Physical risks also creates new opportunities for some sectors
- Business-as-usual 3 Degree Pathway may look least impactful over the "near-term" but does not reflect potential catastrophic impacts in next century

Note: Scenario analysis models value the impact of climate on companies over a multi-year horizon, from 15 years to 30 years. The methodology varies in the use of factors, discount rates, and the risk being measured. It is anticipated that climate change will impact companies beyond these horizons. However, as time horizons expand, calculations become increasingly challenging, uncertain, and imprecise.

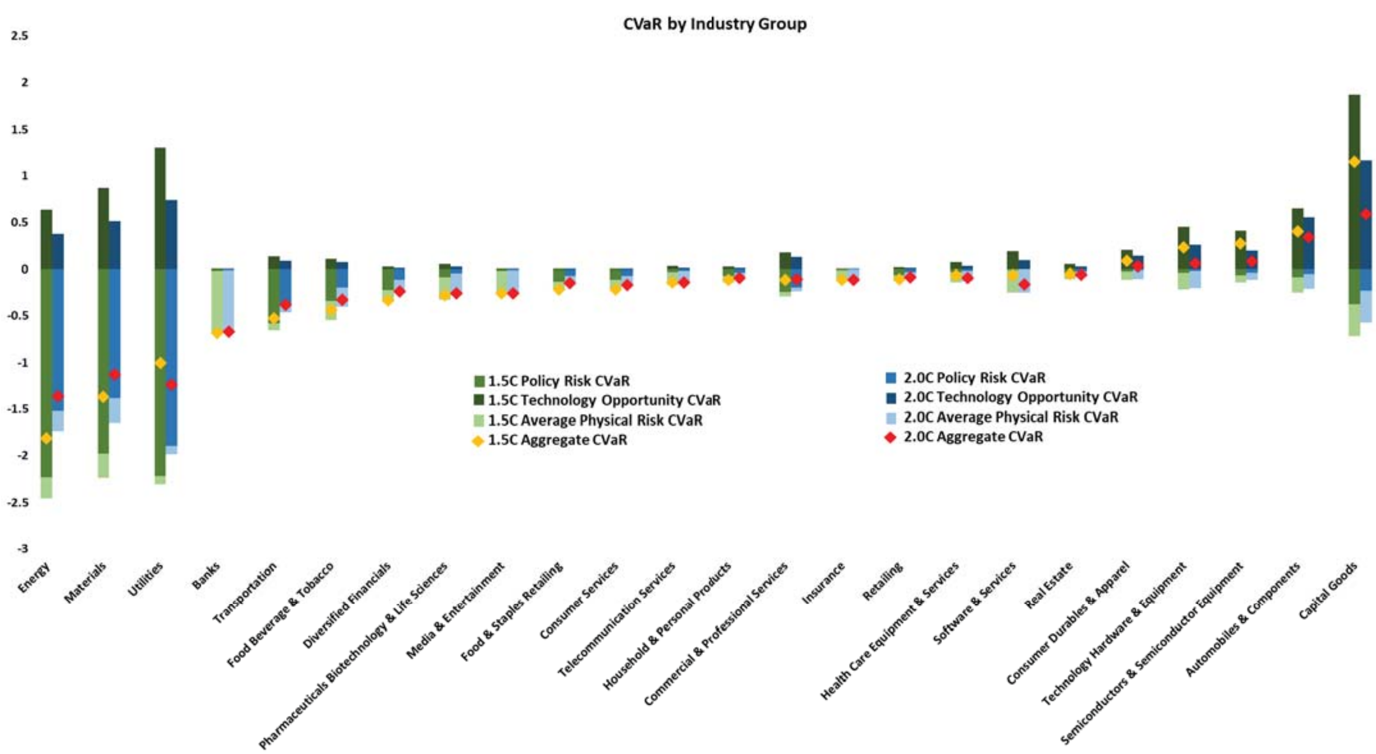
Source: MSCI ESG/Carbon Delta

Prospective Risk & Opportunity Varies by Industry

For illustration purposes, the following chart shows prospective impacts for "Paris-aligned" scenarios

Energy, Materials, and Utilities face significant Policy Risk from 2.0C and lower climate scenarios

Capital Goods could potentially benefit from significant Technology Opportunities



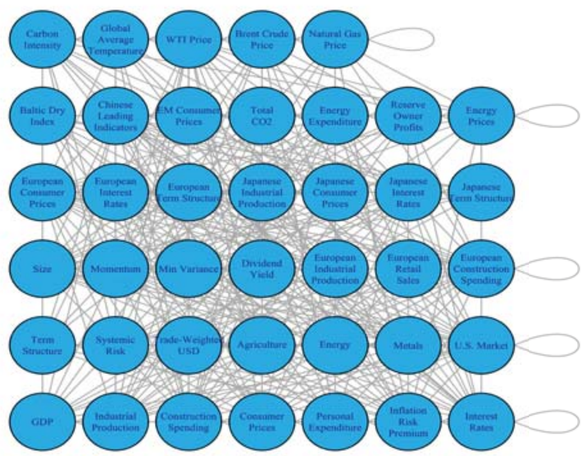
Source: MSCI ESG/Carbon Delta

3. Stress Testing and Capital Market Assumptions

Meketa Approach

- Our clients are often seeking to mitigate risks across their entire investment portfolio over 20-30 year time periods. As a result, we use a top-down approach.
  - We start by using information from our fundamentally driven asset study and our quantitatively driven modelling of economic and financial factors.
    - This information provides us with a foundation of what we know.
    - However, it also leaves an honest assessment of our uncertainty.
    - This uncertainty leads us to define future scenarios in terms of their probability of occurrence.
    - It presents a range of possible outcomes.

How Does the Meketa Model Work?



We take historical factor definitions and their past behaviors to generate direct and indirect relationships among factors. We then use these relationships to generate "simulations" that forecast these factors into the future.

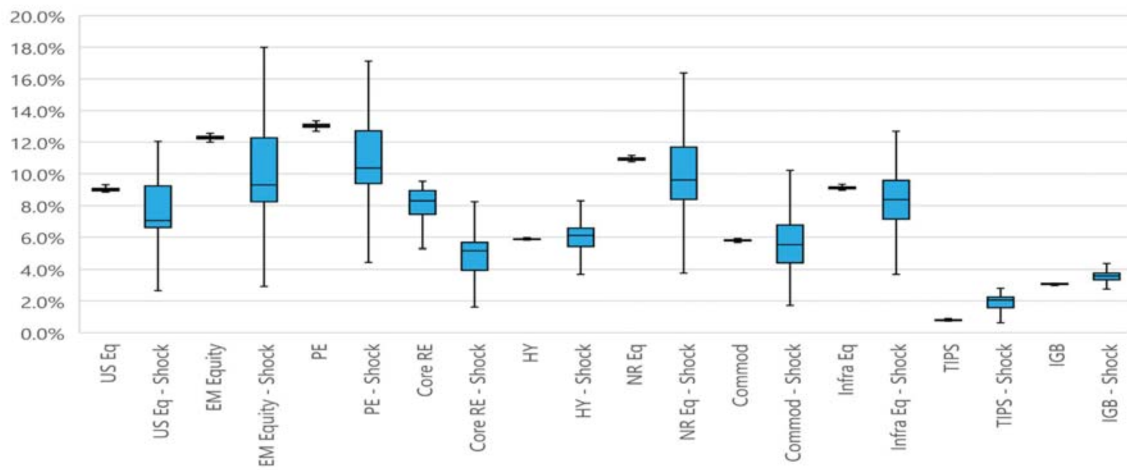
- Each simulation can be thought of as a way the world *could* look in the future.
- We then review the simulations with characteristics we're interested in.

The Physical, Policy, and Technology Scenario Set

During a recent discussion with a client, we ran a preliminary analysis of a set of climate change scenarios to see the impact on different asset classes over the next thirty years.

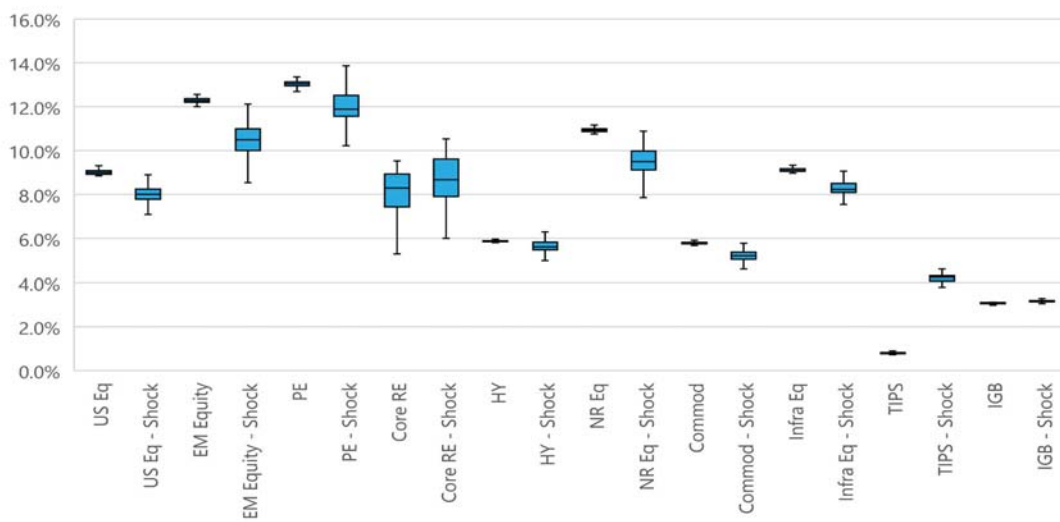
- Physical Change: What happens if global temperatures increase by 2.0°C by 2050?
  - We selected simulations where 2.0°C warming was achieved by 2050.
- Policy Change: What happens if a $100/t$CO_2$ carbon tax is implemented over the next decade?
  - We selected simulations with rises in oil and natural gas prices consistent with the taxation amount and removed simulations where fossil fuel reserve owners had increasing profits.
- Technology Change: What does a world with 3% improvement (i.e., reduction) in carbon intensity of electricity generation look like?
  - We selected simulations where 3% annual intensity improvements occurred within 10 years. Importantly, we made no assumptions about why the improvements occurred.

Scenario 1: Temperature Increase of 2.0°C by 2050 (annualized %)



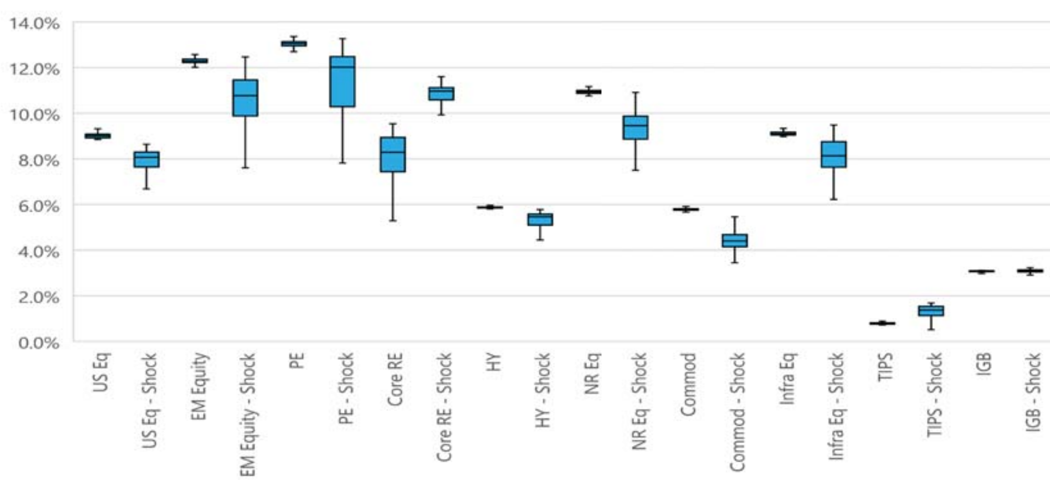
- Equity returns trend lower than baseline but with upside potential to make up difference.
- Real estate returns are challenged; infrastructure is only a little lower returning than in the baseline but with high variability.
- Natural resources and commodities have returns close to baseline with positive outlier scenarios.
- IGBs and TIPS do moderately better than baseline while high yield is consistent with baseline.

Scenario 2: $100/tCO2 Carbon Tax Implemented (annualized %)



- Equity returns trend lower than baseline and it's a stretch to make up difference (PE has most upside).
- Real estate returns are moderately higher, infrastructure moderately lower than baseline.
- Natural resources and commodities do poorer than baseline.
- IGBs are consistent with baseline but TIPS do much better – potentially implies high inflation.

Scenario 3: 3% Carbon Intensity Reduction (annualized %)



- Equity-sensitive returns trend lower than baseline with significant downward tails.
- Inflation-sensitive asset classes (Real Estate, TIPS) that are not linked to commodity prices tended to increase, while inflation-sensitive assets more closely linked to commodities performed lower than baseline on average with significant downside outliers.
- The results seem consistent with stagflation.

Next Steps

What Are the Takeaways for Investors?

- Plans are in for a challenging time going forward.
  - One of the consistent themes across scenarios is median equity returns being lower than baseline. While there is some scope for upside in some scenarios, more effort will be required to achieve baseline returns.
- There is considerable variation among asset classes and across scenarios in terms of returns and volatility, with some experiencing significant impacts and others very little.
  - Evaluation of the variance of return and volatility can inform asset allocation, particularly position sizing and risk budgeting.
- Simply divesting from fossil fuel companies is probably not going to provide adequate protection.
  - While natural resources and commodities tend to do worse than baseline, they generally do not do *that much* worse and in some cases can do better than baseline.
- Changing strategy selection within asset classes with highly variable outcomes may be one method to mitigate climate change risk.
  - As an example, infrastructure portfolios mindful of climate risk exposures could perform in the upper portion of the distributions in each scenario.
- Implementation details matter.
  - Our public policy scenarios represent fairly sharp changes; increasing implementation timelines or implementing offsetting policies (e.g., fiscal stimulus) can reduce some negative effects.

Evaluating "Climate-Aware" Strategic Asset Allocation

Conduct a traditional strategic asset allocation study *and* a complementary overlay analysis using forward-looking climate analytics to inform Board's consideration of return assumptions, expected volatility impacts, and asset allocation decisions

Strategic asset allocation analysis aided by:

- Recently enhanced portfolio analytics to assess/track public market exposures
- Efforts to expand data access in private markets
- Continued focus on corporate engagement, such as Climate Action 100+

Strategic asset allocation study may inform Board consideration of near and long-term climate objectives

Prospective Steps Align with Increased TCFD Focus

Taskforce on Climate-related Financial Disclosures (TCFD) four-part framework for climate risk assessment and governance*

- LACERA endorsed the TCFD's recommended reporting framework for corporate reporting in 2019
- Principles for Responsible Investments (PRI) requires TCFD reporting of all signatories
- California legislation requires CalPERS and CalSTRS to report according to TCFD
- California Governor announced expanded California Climate Investment Framework in September 2020

TCFD reporting is nascent and evolving

- LACERA addresses aspects of TCFD, including board oversight and engagement initiatives

Core Elements of Recommended Climate-Related Financial Disclosures

Governance
The organization's governance around climate-related risks and opportunities

Strategy
The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

Risk Management
The processes used by the organization to identify, assess, and manage climate-related risks

Metrics and Targets
The metrics and targets used to assess and manage relevant climate-related risks and opportunities

*California Investment Framework info available here. The United Kingdom government announced a consultation in August 2020 that would require TCFD reporting by UK pension schemes, with info here.

Appendix

Disclaimer

The data sourced from MSCI and TruCost and included herein is intended solely for the purposes stated herein, and should not be relied upon for any other purpose and neither LACERA, MSCI, nor TruCost will bear any liability to any third party for inaccuracies, errors and omissions in the data.

October 5, 2020

TO: Trustees – Board of Investments

FROM: Jonathan Grabel
Chief Investment Officer

Jude Pérez
Principal Investment Officer

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: **STRATEGIC ASSET ALLOCATION DISCUSSION**

One of the Board of Investments' ("BOI") core responsibilities is setting LACERA's Strategic Asset Allocation ("SAA"). The SAA is the key driver of long-term risk and returns for the Fund, and therefore, is a vital component as LACERA pursues its mission to produce, protect, and provide the promised benefits.

Furthermore, LACERA's Investment Beliefs expresses two key tenants on SAA:

1. **Long-term strategic asset allocation will be the primary determinant of LACERA's risk/return outcomes; and**

2. **Asset allocation has a greater effect on return variability than asset class investment structure or manager selection**

Per the Investment Policy Statement ("IPS"), comprehensive asset allocation studies are conducted every three to five years, or at the Board's request. During the last series of SAA exercises for the OPEB Master Trust and Pension Plan, the BOI adopted a shift in allocation framework from traditional to functional categories. Those SAA studies were completed in 2017 and 2018, respectively. Per the IPS standard, as well as highlighted in the 2020 Workplan and at the July 7, 2020 BOI meeting, the SAA review cycle will take place over the next nine months, culminating at the end of the 2021 fiscal year.

At the September 9, 2020 BOI meeting, Meketa discussed the effects the coronavirus pandemic has had on the economy and capital markets, as well as the implications of investing in a very low global interest rate environment. The following presentation (**ATTACHMENT 1**) will expand on the September discussion and will also discuss the importance of further optimization of risk-mitigating strategies, given the changes in market conditions since the previous strategic allocation review. Meketa will review the presentation at the October 2020 BOI meeting.

Attachment

MEKETA
INVESTMENT GROUP

Strategic Asset Allocation Discussion

October 2020

Introduction

- At the past BOI meeting in September, Meketa discussed the effects the coronavirus pandemic has had on the economy and capital markets, as well as the implications of investing in a very low global interest rate environment.
- Today's presentation follows up on some of the topics introduced a month ago, specifically a barbell approach to investing. Such an approach already aligns with LACERA's most recent strategic allocation and LACERA's functional framework.
- While LACERA already employs a functional framework and has a strong majority of its assets invested in either the Growth or Risk Mitigating categories, we believe it is important to discuss further optimization given the changes in market conditions since the previous strategic allocation review.
- This presentation is designed to stimulate discussion and analysis regarding the following questions:
  - How much and what types of additional risk is LACERA willing to accept?
  - Is risk allocated efficiently within asset class and functional categories?
- Not addressed today is the work Meketa has started related to conducting an Asset Liability Study for LACERA. We expect to present preliminary results in the coming months.

Considerations

	LACERA Current Targets	LACERA "Risked-Up" Example	Optimization Example
Growth	47%	55%	58%
Credit	12%	9%	4%
Real Assets and Inflation Hedges	17%	17%	16%
Risk Reduction and Mitigation	24%	20%	23%
Expected Return 20 years	6.48%	7.01%	6.98%
Risk	10.82%	12.23%	11.87%
Sharpe Ratio	0.47	0.46	0.47

- Due to changes in the capital markets (primarily lower rates), the current asset allocation targets are projected to produce a long term (20 years) expected return of 6.5%, on average, per year.
- The greatest risk LACERA faces is not being able to meet its 7% return target, on average. The longer the period of not meeting its target and the larger this shortfall, the greater the risk LACERA faces.
- The upcoming strategic asset allocation review is critically important for LACERA to be successful in carrying out its mission to produce, protect and provide the promised benefits.

Considerations

- First, consider how much total portfolio risk you are willing to take.
  - If you can live with lower returns, there is no need to take on more risk.
  - If not, decide how much additional risk and what level of modifications are acceptable.
- If the decision is to take more risk, then these are options to evaluate.
  - Simply accept more market risk. Consider that risky assets may be less attractive in absolute terms, but perhaps more attractive in relative terms.
  - Take on increased illiquidity risk, which would potentially allow LACERA to capture additional return premiums without increasing the overall volatility of the portfolio.
  - Make further use of a barbell approach. Reduce use of assets where expected returns have declined substantially below LACERA's return target, but which are still highly correlated with equity market/growth risk.
  - Optimize asset class and functional category approaches by focusing on the critical characteristics of each sub component.

Asset Class Optimization – Investment Grade Bonds and TIPS

- If the Fed is going to manage the yield curve to be normally sloped, it reduces the risk of rising rates, particularly for longer-term bonds.
  - Arguably, investors should be less concerned holding intermediate and longer duration bonds.
  - The carry trade will be their friend.
- The most likely cause of rising rates would be the Fed raising them to fight inflation.
  - TIPS may provide more protection than nominal Treasuries in such an environment, but not much.
  - Tilting a TIPS allocation to the short end of the curve would provide a better inflation hedge and less interest rate sensitivity.
  - This allows a portfolio to stick with nominal Treasuries for intermediate and longer durations as a deflationary/bear market hedge.
- Even still, there is some (unknown) tolerance for inflation that the Fed will probably be willing to accept.
  - It is likely higher than the stated 2% target.
  - It would probably be tolerated for an extended period, depending on its magnitude and side effects (e.g., impact on employment).
- LACERA currently invests in Investment Grade Bonds within the Risk Reduction and Mitigation category and TIPS within the Real Assets and Inflation Hedges category, so optimizing these exposures requires analysis across the functional categories.

Asset Class Optimization – Risk Mitigating Strategies

- Risk Mitigating Strategies, or "RMS," is an asset allocation program designed to provide robust, impactful diversification benefits and defensive characteristics relative to growth-like asset classes.
- RMS programs are designed to have:
  - Low correlation with traditional portfolios.
  - Low to negative correlations to equities during volatile markets or equity drawdowns.
- RMS programs generally incorporate at least several of the following strategies:
  - Long Term US Treasuries.
  - Trend Following.
  - Global Macro.
  - Long Volatility.
  - Alternative Risk Premia.
- By diversifying across several of these strategies, it reduces the reliance upon any single component.
  - Each strategy will react differently, depending on the type and magnitude of the drawdown, thus supporting a portfolio approach to building an RMS program.
- LACERA essentially employs a similar approach in the Risk Reduction and Mitigation category, but there may be opportunity to enhance the risk mitigating characteristics of the current allocation.

Implementing RMS

- RMS programs can be tailored to an investor's objectives and constraints.
- The different characteristics of each strategy provide flexibility regarding the structuring of programs.
- The program design takes advantage of these differences to construct a robust and customized solution.

RMS Expected Performance by type of Equity Environment

Strategy Expected Performance	Equities Trending Up	Drawdown: 0 to 10% Time Period: 0 to 15 days	Drawdown: 10 to 25% Time Period: 15 to 45 days	Drawdown: > 25% Time Period: > 45 days
Positive	• Long Term Treasuries (assuming stable rates environment) • Alternative Risk Premia (positive carry)	• Long Volatility	• Long Volatility (high convexity) • Global Macro	• Long Volatility (high convexity) • Global Macro • Long Term Treasuries (safe haven) • Trend Following (short equities)
Flat or Uncertain	• Global Macro • Trend Following	• Long Term Treasuries (depends on interest rate environment) • Global Macro (depends on prior positioning) • Alternative Risk Premia	• Long Term Treasuries (depends on interest rate environment) • Trend Following • Risk Premia (low correlation to equities)	• Alternative Risk Premia (low correlation to equities)
Negative	• Long Volatility • (Negative carry)	• Trend Following (reversals)		

Implementing RMS: What is Under the Hood Matters

- Changes within the RMS structure can be substantial, and lead to different outputs. LACERA's Current Risk Reduction and Mitigation portfolio, as modeled in the last Strategic Asset Allocation Study, is shown below. To its right, we highlight a potential new allocation to illustrate how the Risk Reduction and Mitigation portfolio may be modeled in the future, and what the implications of such change might be (next page).

RMS – What is Under the Hood Matters

	LACERA RRM Current (%)	LACERA RRM Potential (%)
Cash Equivalents	4	4
Investment Grade Bonds	80	60
Long-term Government Bonds	0	20
Long-Short	3	0
Event-Driven	5	0
Global Macro	2	5
CTA - Trend Following	2	6
Fixed Income/Long-Short Credit	1	0
Relative Value/Arbitrage	4	0
Long Puts	0	5

Implementing RMS: What is Under the Hood Matters

- Changes within the RMS structure can lead to materially different portfolio outcomes.

RMS Scenario Analysis

Negative Historical Scenarios

Scenarios	LACERA RRM Current (%)	LACERA RRM Potential (%)
Taper Tantrum (May - Aug 2013)	-2.97	-5.03
Global Financial Crisis (Oct 2007 - Mar 2009)	4.61	12.07
Popping of the TMT Bubble (Apr 2000 - Sep 2002)	24.65	27.64
LTCM (Jul - Aug 1998)	0.50	2.50
Crash of 1987 (Sep - Nov 1987)	1.19	2.90
Stagflation (Jan 1973 - Sep 1974)	5.77	8.36

Stress Testing

Scenarios	LACERA RRM Current (%)	LACERA RRM Potential (%)
10-year Treasury Bond rates rise 200 bps	-7.43	-11.71
Baa Spreads widen by 50 bps, High Yield by 200 bps	3.11	4.07
Baa Spreads widen by 300 bps, High Yield by 1000 bps	-2.33	2.71
Trade Weighted Dollar gains 20%	2.86	5.72
US Equities decline 25%	-0.66	2.63
US Equities decline 40%	-2.45	3.55

Reaching 7% - Potential/Expanded Asset Classes to Utilize

20 Year Expected Returns > 7.0%

Meketa Assumptions 20 YR[1]	Expected Return (%)	Standard Deviation (%)	Liquidity[2]
Frontier Market Equity	9.5%	21.0%	Liquid
Opportunistic Real Estate	9.3%	24.0%	Illiquid
Buyouts	9.1%	24.0%	Illiquid
Venture Capital	8.9%	34.0%	Illiquid
Emerging Market Equity	8.8%	24.0%	Liquid
Infrastructure (Non-Core Private)	8.6%	22.0%	Illiquid
Energy (formerly Oil & Gas E&P)	8.1%	24.0%	Illiquid
Value-Added Real Estate	8.0%	18.0%	Illiquid
US Micro Cap	8.0%	22.0%	Liquid
MLPs	7.8%	20.0%	Liquid
Mining	7.8%	34.0%	Illiquid
Natural Resources (Private)	7.7%	21.0%	Illiquid
Global Equity	7.6%	17.0%	Liquid
US Mid Cap	7.4%	19.0%	Liquid
Direct Lending - Second Lien	7.3%	15.0%	Illiquid
Infrastructure (Public)	7.2%	17.0%	Liquid
Farmland	7.0%	12.0%	Illiquid

[1] Capital Market Expectations are based off of 2020 Interim Expectations.
[2] Illiquid investments are considered to have quarterly or longer redemption periods.

Risk Mitigating Assets - Potential/Expanded Asset Classes to Utilize

Correlation with Global Equity <0.25%

	Correlation to Global Equity[1]
Long Puts	-0.55
Intermediate Government Bonds	-0.25
Long-term Government Bonds	-0.25
Long-term Strips	-0.25
Short-term Investment Grade Bonds	-0.05
Cash Equivalents	0.00
CTA - Trend Following	0.00
Investment Grade Bonds	0.05
Long-term TIPS	0.05
Intermediate Government/Credit Bonds	0.10
Mortgage-Backed Bonds	0.10
TIPS	0.10

[1] Capital Market Expectations are based off of 2020 Interim Expectations.

Summary and Next Steps

- Historically low rates represent a significant challenge for LACERA (and other like investors) to achieve its target return.
  - While doing so will prove challenging, it is not impossible.
  - LACERA must answer questions regarding how much and what types of additional risk it is willing to accept to pursue its target return.
- Uncertainty is high.
  - Not knowing where the market is heading supports the case for a diversified portfolio, which is a core belief for LACERA.
- Next steps include:
  - Analyzing Board of Investments survey results.
  - Reviewing Capital Markets Expectations ("CMEs").
  - Working with the Board, Staff and asset category consultants to review asset class approaches (this is an extension of the ongoing analysis provided during the structure reviews).
  - Presenting initial findings of the Asset Liability Study, and possible iterations thereafter, for both the OPEB and the Pension Funds.
  - Discussing suitability of benchmarks.
  - Addressing risk budgeting.

Disclaimers

These materials are intended solely for the recipient and may contain information that is not suitable for all investors. This presentation is provided by Meketa Investment Group ("Meketa") for informational purposes only and no statement is to be construed as a solicitation or offer to buy or sell a security, or the rendering of personalized investment advice. There is no agreement or understanding that Meketa will provide individual advice to any advisory client in receipt of this document. There can be no assurance the views and opinions expressed herein will come to pass. Any data and/or graphics presented herein is obtained from what are considered reliable sources; however, its delivery does not warrant that the information contained is correct. Any reference to a market index is included for illustrative purposes only, as an index is not a security in which an investment can be made and are provided for informational purposes only. For additional information about Meketa, please consult the Firm's Form ADV disclosure documents, the most recent versions of which are available on the SEC's Investment Adviser Public Disclosure website (www.adviserinfo.sec.gov) and may otherwise be made available upon written request.

L//CERA

September 10, 2020

TO: Trustees - Board of Investments

FROM: Santos H. Kreimann SHK
Chief Executive Officer

Ted Granger TG
Interim Chief Financial Officer

FOR: Board of Investments Meeting on October 14, 2020

SUBJECT: **2020 ACTUARIAL RISK ASSESSMENT REPORT**

Overview

LACERA requested that Milliman prepare a separate Actuarial Standard of Practice (ASOP) No. 51 or “Risk Assessment” report and present it to the Board of Investments Trustees. The report, new to LACERA’s annual actuarial reporting cycle, includes additional information regarding the consulting actuary’s risk assessment analysis and provides an opportunity for the Board to discuss and evaluate these actuarial concepts outside of a routine report presentation. This mid-year discussion focuses on key actuarial concepts and serves as an additional educational opportunity in which the consulting actuary will also briefly review new and upcoming ASOPs.

The 2020 Actuarial Risk Assessment Report (2020 Risk Assessment) is included as Attachment A. Milliman has also prepared a presentation based on this report (see Milliman’s Presentations Slides, Attachment B). The report and analysis is based upon the work completed for the most recent June 30, 2019 Actuarial Valuation of Retirement Benefits (2019 Valuation) report, presented to the Board of Investments in March 2020. The 2019 Valuation included a summary of significant ASOP 51 elements and discussion, beginning on Page 43 (see Attachment C).

Actuarial Standards

The Actuarial Standards Board (ASB) sets standards for appropriate actuarial practice in the United States through the development and promulgation of Actuarial Standards of Practice (ASOPs). These ASOPs describe the procedures an actuary should follow when performing actuarial services and identify what the actuary should disclose when communicating the results of those services.

In September 2017, the ASB adopted Actuarial Standard of Practice No. 51, *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions* (ASOP 51). This ASOP provides guidance to actuaries when performing certain actuarial services with respect to measuring obligations under a defined benefit pension plan (plan) and calculating actuarially determined contributions for such plans, with regard to the assessment and disclosure of the risk that actual future measurements may differ significantly from expected future measurements.

This new actuarial standard (ASOP 51) became effective for any actuarial work product with a measurement date on or after November 1, 2018 and applies to actuaries when performing a funding valuation of a pension plan.

The 2020 Risk Assessment and presentation provide various risk scenarios that may impact future expected measurements such as the pension obligations, investment returns, actuarially determined contributions, and the plan's funded status. Milliman links these risks to the actuarial assumptions used in calculating these future expected measurements provided in their 2019 Valuation report. Milliman also identifies controls in place to mitigate these risks and the limitations of these mitigating controls. Their analysis should provide the Board with an additional perspective that could be referenced in the future, when contemplating decisions on investment matters such as asset allocation and when setting actuarial assumptions.

Future Actuarial Reports
The table below provides a reminder of future actuarial reports for the Retirement Benefits Plan:

Future Reports	**Fiscal Year**	**Board Meeting (estimated)**
2020 Actuarial Valuation (annual)	June 30, 2020	December 2020
2021 Risk Assessment (annual)	June 30, 2020	August 2021
2022 Experience and Assumption Study (every three years)	June 30, 2022	October 2022

LACERA's consulting actuaries, Nick Collier, Mark Olleman, and Craig Glyde with Milliman, will be attending the October 14, 2020 meeting to discuss the inaugural 2020 Actuarial Risk Assessment report results and answer any questions from the Board. Management encourages active Board discussion of the risk information contained in the report.

Attachments

A. Milliman's 2020 Actuarial Risk Assessment Report
B. Milliman's October 14, 2020 Presentation Slides
C. June 30, 2019 Actuarial Valuation of Retirement Benefits Report

SHK:tg
BOI Memo-2020 Risk Assessment (ASOP 51)–Final

c: Steven P. Rice, LACERA
Jonathan Grabel, LACERA
Richard Bendall, LACERA
Fesia Davenport, Acting CEO, Los Angeles County

(Attachment A)

Milliman’s 2020 Actuarial Risk Assessment Report

Los Angeles County Employees Retirement Association

Risk Assessment

Based on June 30, 2019 Actuarial Valuation of Retirement Benefits

Prepared by:

Mark Olleman, FSA, EA, MAAA
Consulting Actuary

Nick Collier, ASA, EA, MAAA
Consulting Actuary

Craig Glyde, ASA, EA, MAAA
Consulting Actuary

Milliman, Inc.
1301 Fifth Avenue, Suite 3800
Seattle, WA 98101-2605
Tel +1 206 624 7940
milliman.com

Issued September 8, 2020

1301 Fifth Avenue
Suite 3800
Seattle, WA 98101-2605
USA

Tel +1 206 624 7940

milliman.com

September 8, 2020

Board of Investments
Los Angeles County Employees Retirement Association
300 North Lake Avenue, Suite 820
Pasadena, CA 91101-4199

Re: **Los Angeles County Employees Retirement Association**

Dear Members of the Board:

As requested, we have performed a risk assessment based on the actuarial valuation of retirement benefits for the Los Angeles County Employees Retirement Association (LACERA) as of June 30, 2019. The purpose of this report is to communicate key risk factors that could affect LACERA's future funding.

We have provided financial information showing the estimated hypothetical impact of various modifications to the valuation assumptions. We believe the valuation assumptions provide a reasonable estimate of anticipated experience affecting LACERA. However, as discussed in this report, the emerging costs will vary from those presented in the valuation to the extent that actual experience differs from that projected by the actuarial assumptions. Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as the following:

- Plan experience differing from the actuarial assumptions,
- Future changes in the actuarial assumptions,
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as potential additional contribution requirements due to changes in the plan's funded status), and
- Changes in the plan provisions or accounting standards.

In preparing the valuation this report is based upon, we relied without audit on information (some oral and some in writing) supplied by LACERA's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We used LACERA's benefit provisions as stated in our June 30, 2019 Actuarial Valuation report. In our examination, after discussion with LACERA and making certain adjustments, we have found the data to be reasonably consistent and comparable with data used for other purposes. Since the risk assessment results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations might need to be revised.

This valuation, which this risk assessment is based upon, provides an estimate of the LACERA's financial condition as of a single date. The valuation can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. We have shown the results based on a variety of alternative assumptions and scenarios in this report. These alternatives are not intended to be inclusive of all the possible outcomes.

Milliman’s work is prepared solely for the internal business use of LACERA. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman’s work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman’s consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exception(s):

(a) The System may provide a copy of Milliman’s work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman’s work for any purpose other than to benefit the System.

(b) The System may provide a copy of Milliman’s work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are retirement actuaries. Milliman’s advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

We respectfully submit the following report, and we look forward to discussing it with you.

Sincerely,

Mark C Olleman

Mark Olleman, FSA, EA, MAAA
Consulting Actuary

Nick Collier

Nick Collier, ASA, EA, MAAA
Consulting Actuary

Craig Glyde

Craig Glyde, ASA, EA, MAAA
Consulting Actuary

Table of Contents

1. Report Overview

Introduction

The results of any actuarial valuation are based on one set of assumptions. Although we believe the current assumptions used in LACERA's June 30, 2019 actuarial valuation provide a reasonable estimate of future expectations, it is almost certain that future experience will differ, to some extent, from the assumptions. It is therefore important to consider the potential impacts of these likely differences when making decisions that may affect the future financial health of the plan, or of the plan's members.

Actuarial Standard of Practice No. 51 (ASOP 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions) addresses these issues by providing actuaries with guidance for assessing and disclosing the risk associated with measuring pension liabilities and the determination of pension plan contributions. Specifically, it directs the actuary to:

- Identify risks that may be significant to the plan, and in some cases to the plan's participants.
- Assess the risks identified as significant to the plan. The assessment does not need to include numerical calculations.
- Disclose plan maturity measures and historical information that are significant to understanding the plan's risks.

The June 30, 2019 actuarial valuation includes a section that provides a general discussion of these risks. This report provides a more detailed discussion of the potential risks and a quantitative analysis of the potential impact of selected risk factors.

Addressing Risks

This report is designed to identify and assess risks. Once these risks are understood, the important issue for LACERA is how these risks are addressed and potentially reduced. LACERA already has procedures in place to mitigate key aspects of these risks, as summarized below.

- **Assets:** LACERA regularly performs asset allocation studies which are integrated with LACERA's funding in order to set a target allocation that maximizes return at a level of risk that is acceptable to the system.
- **Liabilities:** LACERA has regular investigations of experience performed to monitor and set the assumptions and methods used to calculate the liabilities.
- **Funding:** LACERA strives to balance projected funding levels with reasonable and stable employer contribution rates. In particular, to strengthen long-term funding LACERA recently reduced the amortization period to pay off new unfunded amounts to 20 years. To help stabilize year-to-year changes in the employer contribution rate, a five-year asset smoothing period is used.

As discussed above, LACERA has several procedures in place to mitigate risk; however, the effectiveness of these techniques is limited. There will always be a trade-off between projected funding levels and low employer contribution rates, particularly for a mature plan such as LACERA. The risks inherent in these limitations are discussed further in this report.

Note that when action is taken to reduce risk, there is almost always a cost, sometimes referred to as the "cost of certainty." For example, reductions in investment risk tend to reduce expected returns, which increases expected costs. These additional costs will generally be in the form of increased employer contributions. LACERA should regularly evaluate the current level of risk and whether more resources should be devoted to reducing risk.

Report Outline

The remainder of the report is divided into four sections.

Section 2 (Identification of Risks) This section identifies and discusses the key risks to LACERA's future funding. In our opinion the key risk factors are investment returns, payroll increases, compensation increases, and mortality, with investment returns being the biggest risk. Looking at the sources of change in the Unfunded Actuarial Accrued Liability over the past twenty valuations, the single biggest source of annual change in most years is the return on investments being either greater than or less than the assumption.

Section 3 (Maturity Measures) Like other public retirement systems, LACERA continues to mature. As pension plans mature, they become more sensitive to certain risks. In this section, the maturity of LACERA is examined in the context of the number of active members to retirees, the projected cash flows, and volatility ratios.

Section 4 (Historical Measures) One way to assess future risks is to look at historical measurements. In this section, we review how the employer contribution rate and Funded Ratio have changed over the last 20 to 30 years. We also look at past investment returns for LACERA as they have been a key factor in the other two measurements.

Section 5 (Assessment of Risks) This section analyzes the potential impact of key risk factors on future employer contribution rates and Funded Ratios, with the emphasis on investment returns. For example, in the subsection titled Historical Returns, it is shown that if the returns from the 1990s were to recur, the employer contribution rate is projected to decrease to 0% of pay; whereas, if the returns from the 2000s were to recur, the employer contribution rate is projected to increase to 40% of pay. Note that member contribution rates are not included in this analysis, as they are not materially impacted by future experience, only assumption changes.

2. Identification of Risks

Factors Affecting Future Results

There are a number of factors that will affect future valuation results. To the extent actual experience for these factors varies from the assumptions, this will likely cause either increases or decreases in the plan's future funding level and the employer contribution rate. The factors that can have the most significant impact on LACERA's valuation results are:

- Investment risk

To the extent that actual investment returns differ from the assumed investment return, the plan's future assets, employer contribution rate, and funded status may differ significantly from those presented in the valuation. There are a myriad of factors that can influence investment markets, such as the current COVID-19 pandemic. In addition to the risk of variances in the investment markets, leverage and illiquidity of investments may magnify investment gains or losses for LACERA. Further, risk may be increased if restrictions are put on available investments that impact future returns. These types of risks are outside the scope of our analysis, but we have quantified the potential overall impact of variance in past and future investment returns below and in Section 5, Assessment of Risks.

- Compensation risk

Individual member retirement benefits are linked to the member's compensation. As such, assumptions need to be made as to a member's future compensation increases. Higher future compensation increases will generally result in larger retirement benefits, liabilities, employer contribution rates, and a lower funded status. Conversely, lower compensation increases than assumed will generally result in smaller retirement benefits, liabilities, employer contribution rates, and a higher funded status.

- Payroll risk

In the valuation, an assumption is made for the overall rate of payroll growth of LACERA from year-to-year. To the extent that the overall rate of payroll growth is greater than assumed, the employer contribution rate may decrease since the Unfunded Actuarial Accrued Liability (UAAL) will be amortized over a larger payroll base. The opposite will occur if the overall rate of payroll growth is lower than assumed. For example, it is likely the current COVID-19 pandemic will result in many public employers reducing their payroll. If Los Angeles County were to reduce its payroll, an offsetting increase in the UAAL contribution percentage rate would be necessary to maintain the contribution level needed by LACERA. Note that the impact of payroll increases different than assumed will often have some offsetting impact of individual compensation increases different than assumed.

- Longevity and other demographic risks

The liabilities reported in the valuation were calculated by assuming that members will follow specific patterns of demographic experience (e.g., mortality, retirement, termination, disability) as described in Appendix A of the valuation report. To the extent that actual demographic experience is different than is assumed to occur, future liabilities, employer contribution rates, and funded status may differ from that presented in the valuation. In light of current events, a good example of a circumstance where mortality may deviate materially from the assumption is a pandemic. However, at this point, we do not expect that any increased mortality from the current COVID-19 pandemic will significantly affect LACERA's funding. Further, any impact would likely have a positive financial impact in the form of lower-than-projected liabilities. An example which could pose a risk to LACERA would be a cure for a broad range of cancers, which could reduce mortality over an extended period of time and therefore materially increase future benefit payments.

- Contribution risk

Contribution risk is defined in ASOP 51 as the potential of actual future contributions deviating from expected future contributions. For example, for some retirement systems in the US, a significant source of their underfunding has been the plan sponsor not making the actuarially determined contribution. If the County does not make its full contribution in the future, it could present a significant risk to LACERA's funding. We have assumed for purposes of this analysis that LA County will continue to contribute at the actuarially determined rate in the future. It should be noted that the County has consistently made its actuarially determined contribution in the past, and there are legal requirements specified in the 1937 Act that govern future contributions. However, there are several ways contributions are being pushed off into the future: 1) the STAR Reserve is included in assets, but STAR liabilities are not; 2) contribution increases due to assumption changes have been phased in instead of recognized immediately; and 3) the County has a history of reflecting contribution rate decreases as soon as possible (July) and deferring increases as late as possible (September). We do not view any of these as a significant risk to LACERA, but lower contributions in the short term means higher contributions will ultimately be needed. For example, the phase-in of the employer contribution rate resulted in a smaller short-term increase, but the ultimate increase in the employer contribution rate effective with the fiscal year beginning in 2022 is projected to be 0.22% of pay higher for the following 18 years.

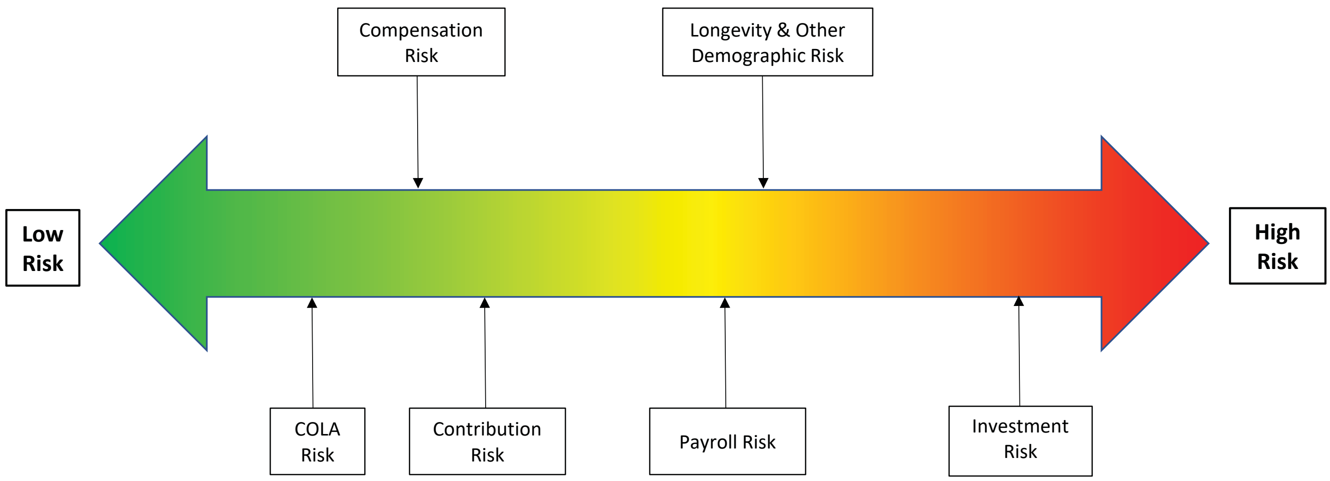
- COLA risk

COLA risk is the potential of actual future cost-of-living adjustments deviating from the assumed increases. LACERA's funding could be adversely impacted if greater-than-assumed inflation causes future COLAs to exceed the assumption. For LACERA, COLAs are capped at either 2% or 3% based on the respective plan. As the assumed COLAs for Plans B-E and G are set equal to the cap, there is no direct risk of the actual COLA exceeding the assumption. For Plan A, there is a small risk as the assumed COLA is 2.75% and the cap is 3.00%, so the actual COLA could potentially exceed the assumption by 0.25%. As Plan A retirees account for less than half of the total retiree liability and this proportion is projected to decline in the future, we believe the direct COLA risk is small. There is also an indirect COLA risk related to the STAR COLA Reserve. If future inflation exceeds the cap amount, this would lead to the erosion of retirees' purchasing power and an increase in COLA bank amounts that could exceed 20% which would exceed the threshold for additional STAR COLA benefits. If STAR COLAs are granted, this would decrease the STAR COLA reserve and increase the UAAL.

The assumptions are reviewed in detail during the triennial Investigation of Experience study and are also reviewed annually during the valuation process. Changes in assumptions are generally recommended as part of the triennial Investigation of Experience if actual experience has been materially different than assumed or forecasts have changed materially. Additionally, changes may be recommended and discussed at each valuation if they are deemed to be appropriate at that time.

Relative Magnitude of Each Risk

The prior discussion identified the key risks to LACERA's funding. Which risk poses the biggest threat? The analysis at the end of this section provides a historical analysis of how these risks have affected LACERA's funded status. Which of these factors will have the greatest impact on LACERA's future funding is unknown; however, based on the analysis shown in this report and our experience working with public sector retirement systems, we have provided the following ranking of the risks from the greatest risk to the least risk. This is also illustrated in the scale below. Note that we considered both the likelihood of a negative impact as well as the potential magnitude. For example, if long-term inflation is expected to average the assumption of 2.75%, there is a 50% probability that the Plan A COLA will exceed the assumption, which will result in future actuarial losses, so the probability of this occurring is fairly high; however, the potential magnitude is low due to the 3% Plan A COLA cap, so we view the associated COLA risk to be low.



Note: Above chart is based on Milliman's opinion and is not numerically based.

Risk Factor	Commentary
Investment risk	Historically investment performance has had the greatest impact on LACERA's Funded Ratio and the employer contribution rate. We believe it is likely that this will continue to be the case in the future.
Longevity and other demographic risks	Of the demographic risks, mortality probably has the greatest potential to impact LACERA's funding. The current valuation assumption includes a provision for mortality improvement, which allows for longevity improvements similar to historical trends; however, if there were a major medical breakthrough, such as a cure for a broad range of cancers, this could significantly increase life expectancies beyond current expectations and materially impact liabilities.
Payroll risk	A significant short-term decline in payroll, or a long-term increase less than the 3.25% assumption, could result in a significant increase in the employer contribution rate as a percentage of payroll. For example, most public entities are dealing with budgetary issues associated with COVID-19, which could cause a combination of reduced hiring, salary freezes, and layoffs, which could negatively impact payroll increases. Note that as long as the calculated employer contribution rate is paid, a decline in payroll should not, by itself, negatively impact the Funded Ratio.
Contribution risk	Our understanding is that there are certain legal requirements that make it unlikely the employers would not pay the actuarially calculated contribution rate; however, if LACERA were not to receive the full contribution amount, this could become a significant risk.
Compensation risk	In light of the current environment, it seems unlikely that larger-than-assumed compensation increases will occur in the short term; however, this could happen in the future. We would note that generally large compensation increases occur when there is either high inflation or a strong economy. Either case is likely to be associated with better-than-assumed investment returns (although in the case of higher inflation, it may take a while for higher returns to materialize), which should mitigate the liability increase due to the compensation increase.
COLA risk	As previously noted, the potential for significant actuarial losses for COLAs greater than the assumption are limited due to the cap on COLAs. Even if a significant increase in inflation were to occur and STAR benefits were used, the STAR Reserve is only about 1% of total assets and this proportion is projected to decline as the STAR Reserve is not credited interest under current policy, so the potential negative impact is relatively small.

How We Got Here: Analysis of Changes in Unfunded Actuarial Accrued Liability

The portion allocated to service already rendered or accrued is called the Actuarial Accrued Liability (AAL). The difference between the AAL and the Valuation Assets is called the UAAL. If a UAAL exists, it usually results from prior years' benefit or assumption changes and the net effect of accumulated gains and losses. If the employer had always contributed the current Normal Cost, and if there were no prior benefit or assumption changes, and if actual experience exactly matched the actuarial assumptions, then the present value of all future Normal Cost contributions would be sufficient to fund all benefits and there would be no UAAL.

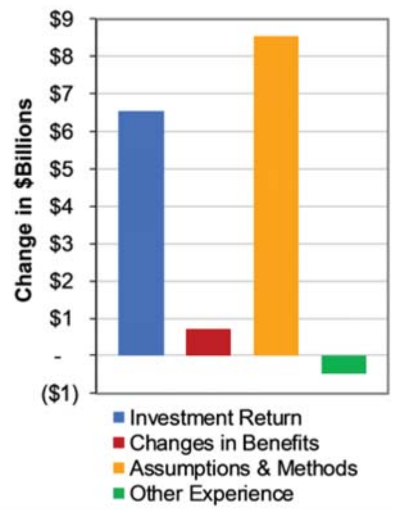
The UAAL, at any date after establishment of a pension plan, is affected by any actuarial gains (decreases in UAAL) or losses (increases in UAAL) arising when the actual experience of the pension plan varies from the experience anticipated by the actuarial assumptions. To the extent actual experience, as it develops, differs from that expected according to the assumptions used, so also will the emerging costs differ from the estimated costs. Additionally, changes in assumptions or benefit provisions can also increase or decrease the UAAL.

Over the last 20 years, the UAAL has increased and decreased from year to year due to a number of factors:

- Investment Returns: The average actual return on market assets for the 20-year period was 6.6% (net of investment expenses) compared to the assumed returns for the period of between 7.25% and 8.0%. This was the primary cause of year-to-year changes in the UAAL.
- Actuarial Assumptions and Methods: Changes in the actuarial assumptions were the primary cause of the total increase in the UAAL over the 20-year period, with the reduction in the investment return assumption from 8.0% to 7.0% having the greatest impact.
- Other Experience: This includes gains and losses from demographic experience different than assumed, such as termination, service retirement, disability retirement, and mortality experience. It also includes the difference between actual and assumed salary increases and COLAs. Salary increases less than assumed were the primary cause of the decrease in the UAAL over the period due to year-to-year (Other) experience.
- Changes in Benefits: Benefit enhancements increased the UAAL over the 20-year period. This was primarily due to the MOU enhancements that were first reflected in the June 30, 2002 actuarial valuation. The relative impact is much smaller than the actuarial assumption changes and the investment returns.

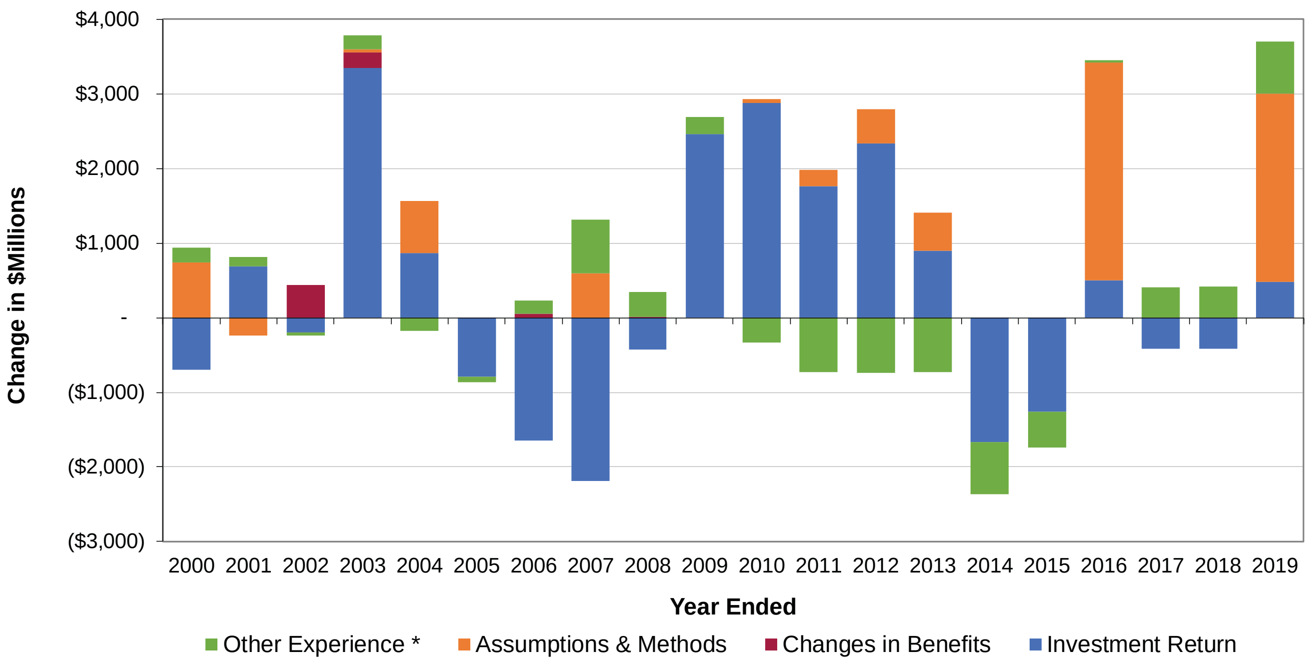
UAAL Changes

An analysis of changes in the UAAL over the last 20 years show the two primary factors that have caused increases in the UAAL are actual investment returns less than the assumed return and changes in assumptions, primarily decreases in the investment return assumption.



The following exhibit shows the sources of change in the UAAL over the past twenty valuations. The single biggest source of annual change in most years is the return on investments being either greater than or less than the assumption (blue bars).

Analysis of Change in Unfunded Actuarial Accrued Liability
(Dollars in Millions)



** Other Experience includes changes due to Salary, CPI, Mortality and other factors.*

3. Plan Maturity Measures

Like other public retirement systems, LACERA continues to mature. As pension plans mature, they become more sensitive to certain risks. In this section, the maturity of LACERA is examined in the context of the number of active members to retirees, the projected cash flows, and volatility ratios.

The magnitude of the year-to-year increase or decrease in the employer contribution rate is affected by the maturity level, and specifically, the asset volatility ratio (the ratio of LACERA assets to payroll). LACERA has accumulated a significant amount of assets relative to its payroll and by several measures is considered a mature plan. Accumulating assets to pay for future benefit obligations is responsible funding, but it does mean that changes in the investment markets can have a significant impact on the employer contribution rate.

This section discusses the following plan maturity measures.

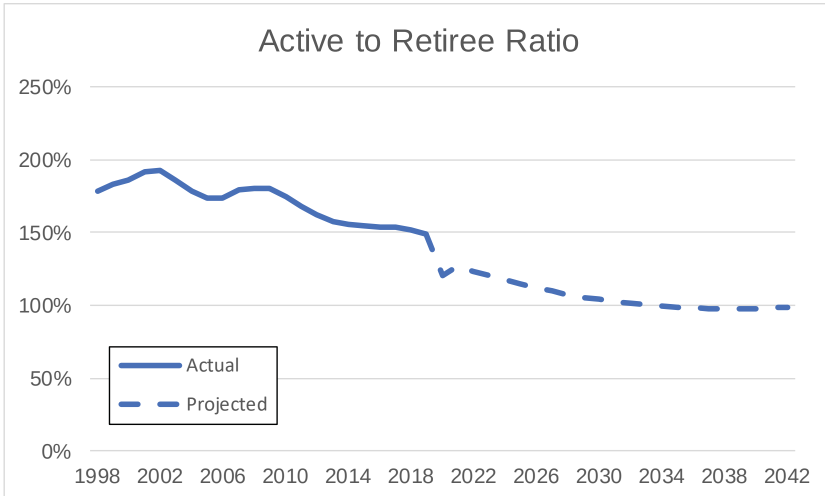
- Active-to-Retiree Ratio: As the percentage of actives declines relative to the number of retirees, this indicates a maturing of the plan.
- Cash Flow: As the cash flow (Contributions less benefit payments) becomes increasingly negative, this generally indicates a maturing of the plan.
- Asset-to-Payroll Ratio: As this ratio increases, this indicates a maturing of the plan and greater sensitivity in the employer contribution rate to investment returns.
- Liability-to-Payroll Ratio: As this ratio increases, this indicates a maturing of the plan and greater sensitivity in the employer contribution rate to liability experience and changes in the assumptions.

Active Members to Retirees Ratio

As the number of retirees (and dollar value of retiree liabilities) grows, the dollar size of any losses associated with retirees also grows. Similarly, as the number of actives compared to retirees decreases, a larger percent of active payroll is needed to finance any losses associated with retirees. The aging of the population and the retirement of baby boomers has been felt by retirement systems across the nation. This demographic shift has long been predicted by actuaries and taken into account in LACERA's funding calculations. Even though it was anticipated, this demographic shift is impacting LACERA and has increased the amount of risk faced, which is seen throughout this report.

There are various ways to assess the maturity level of a retirement system. One is to look at the ratio of active members to retirees. In the early years of a retirement system, the ratio of active to retired members will be very high as the system will be mostly comprised of active members. As the system matures, the ratio starts declining. A mature system will often have a ratio near or below one. For LACERA and other retirement systems in the U.S., these ratios have been steadily declining.

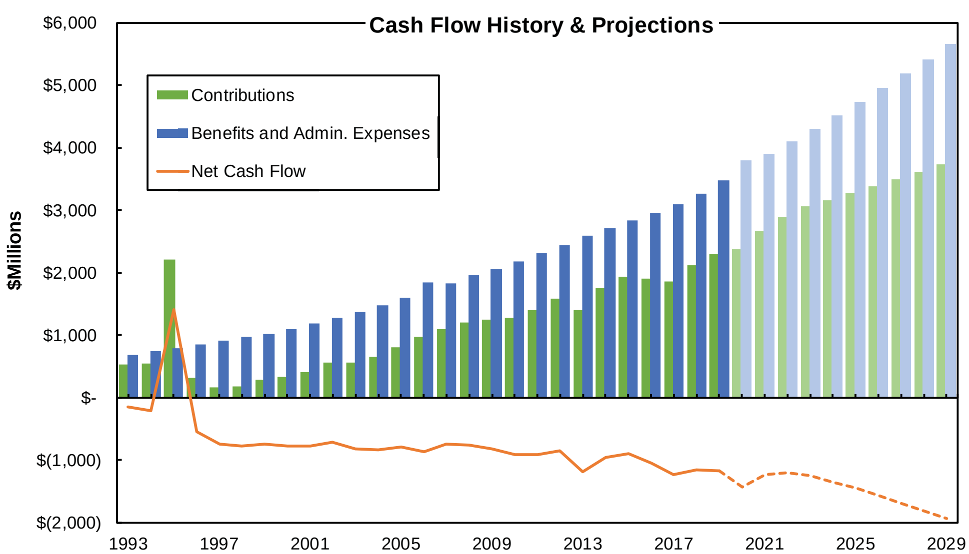
The chart below illustrates LACERA's historical and projected active members to retirees ratio. Consistent with the assumption used in the valuation, we have assumed that the active population will remain at the same level in the future. [Note to LACERA: Projection portion will be updated with next draft and will be slightly greater]



Cash Flow

The cash flows for a retirement system are another good indicator of the maturity level of the system. As a pension plan matures, it is normal for benefit payments to exceed contributions coming into the system. When pre-funding a pension plan, it is important to remember that the objective is to accumulate assets to pay benefits. Put another way, pre-funding is expected to ultimately create negative cash flows. Note that cash flows for purposes of this analysis do not take into account cash income generated from investments.

LACERA has been in a negative cash flow position for over 25 years. The gap between contributions (combined member and employer) and benefits paid plus expenses has increased over time, and this trend is projected to continue in the future. The following graph shows LACERA's projected cash flows. Note that the cash flow is projected to become increasingly negative in about 20 years when LACERA begins paying off its UAAL amortization layers which will result in a reduction in the contributions, all else being equal.



Note: Large increase in contributions in fiscal year ended 1995 is due to pension obligation bonds issued by the County.

Asset and Liability Volatility Ratios

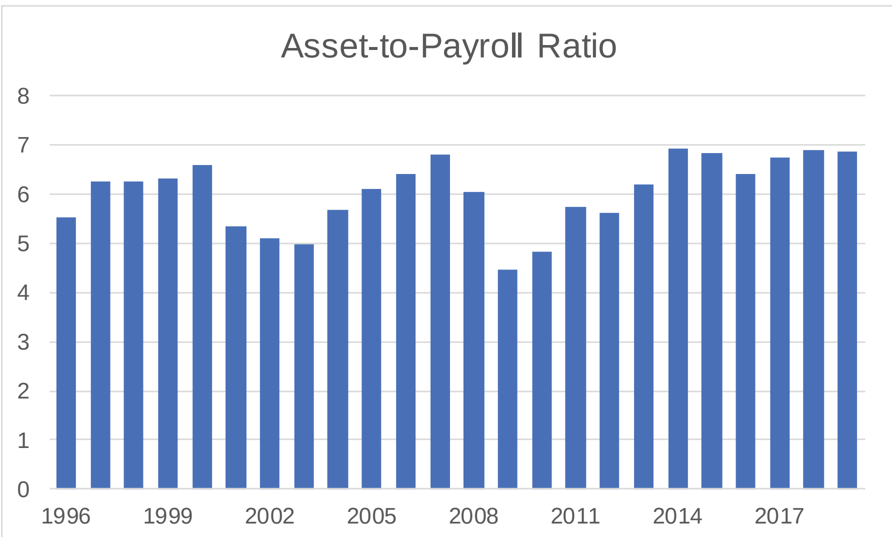
The Asset-to-Payroll ratio, often referred to as the Asset Volatility Ratio (AVR), is a measure of the level of assets to payroll. As assets grow compared to payroll, so does the size of any asset gains or losses compared to payroll. This causes asset gains and losses to have a larger impact on employer contribution rates that are calculated as a percent of payroll. As shown in the following graphs, the AVR has increased over time as LACERA has matured. As of June 30, 2019, LACERA has an Asset Volatility Ratio of 6.9, which is typical of a mature system.

The 6.9 AVR means that for each 1% asset loss (or gain) in relation to the assumed investment return, there will need to be an increase (or decrease) in contributions equivalent to 6.9% of one-year's payroll. Since LACERA's amortization period for future actuarial gains and losses is 20 years, the increase (or decrease) in the employer contribution rate will be spread out over 20 years, resulting in a 0.47% of payroll increase (or decrease) in the total contribution rate needed for each 1% asset loss (gain).

> **Asset Volatility Ratio**
>
> LACERA has an Asset Volatility Ratio of 6.9; that is, assets are about 7 times as big as the payroll. In practical terms, a -3% return is expected to ultimately cause a 4.7% of pay increase in the employer contribution rate.

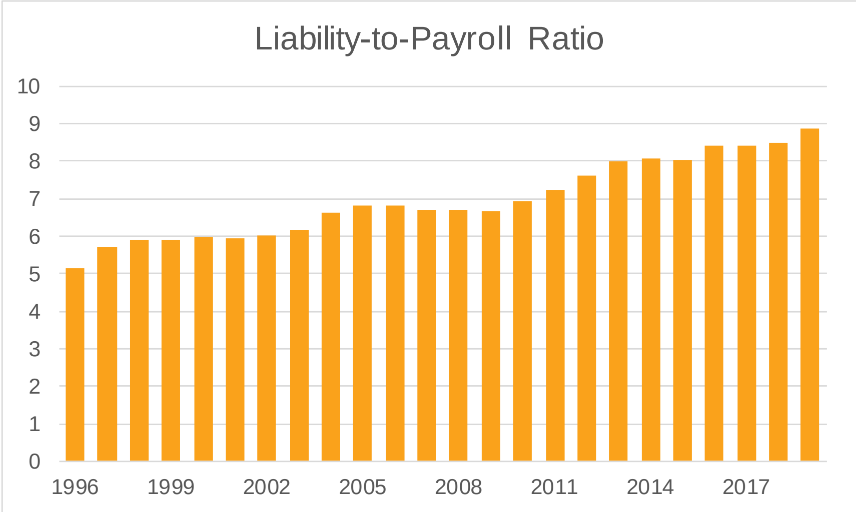
For example, a -3% return is equivalent to a 10% actuarial asset loss, as the return is 10% less than the actuarial assumption of 7%. Thus, a -3% return is expected to cause a 4.7% of pay increase in the employer contribution rate to amortize the associated increase in the UAAL over 20 years. However, this would not be recognized immediately due to LACERA's asset smoothing method, but would gradually occur over five years.

The following graph shows that LACERA has gradually matured over the last 20+ years, as represented by the increasing AVR, although the ratio has declined in some years corresponding to those with poor investment returns in the prior year.



Another measure of a system's maturity is the ratio of the AAL to the payroll, often referred to as the Liability Volatility Ratio (LVR). This ratio provides an indication of the longer-term potential for employer contribution rate volatility when LACERA becomes fully funded. In addition, this ratio provides an indication of the potential contribution rate volatility due to liability experience (gains and losses) and liability re-measurements (assumption changes). For LACERA, the current LVR is 8.9. Ultimately, the Asset and LVR should converge to the LVR as LACERA moves toward 100% funding in the future.

The following graph shows the historical LVR. The ratio has increased gradually, with much less year-to-year variance than observed in the Asset Volatility Ratio.



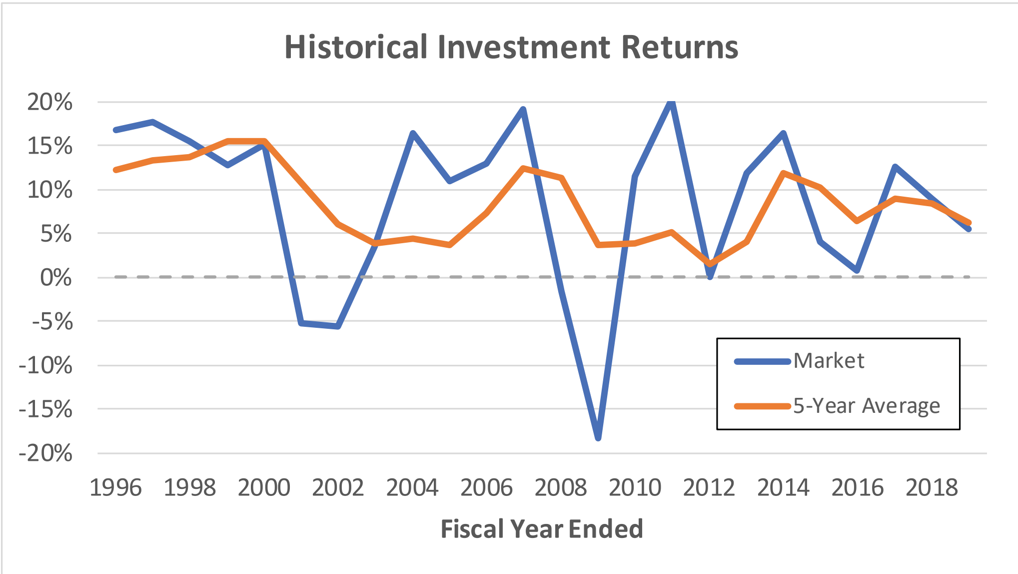
4. Historical Measures

One way to assess future risks is to look at historical measurements. This section discusses the following historical measures.

- Investment Returns
- Funded Ratio
- Employer Contribution Rate

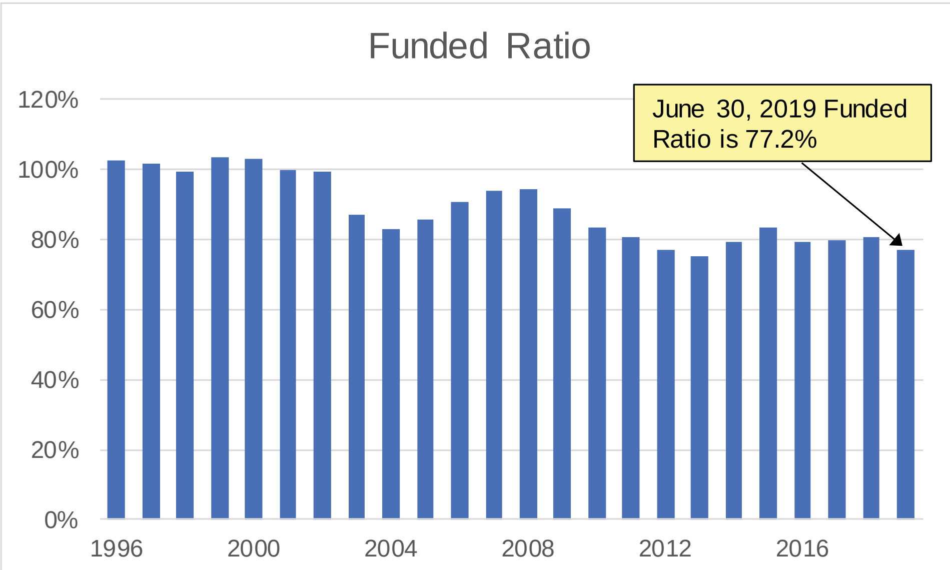
Historical Investment Returns

Reviewing LACERA's funding over the last 20 years shows significant variation. The primary factor in the overall trend and the year-to-year variance has been investment returns. The valuation uses an actuarial asset method that smooths investment gains or losses (in relationship to the assumed return) over a five-year period. The following graph presents a comparison of historical returns for LACERA on a market basis and a 5-year average to approximate the return on actuarial assets. Although the five year average is smoother, it has still been as high as 15% and as low as 2%, showing that not all market volatility can be smoothed over time.



Historical Funded Ratios

The following graph shows how LACERA's Funded Ratio has varied over the last 25 years. In particular, it reflects the significant impact that investment returns can have. The two periods where LACERA experienced significant declines in its Funded Ratio were following the dot-com bubble of the early 2000s and the Great Recession that started in 2008.

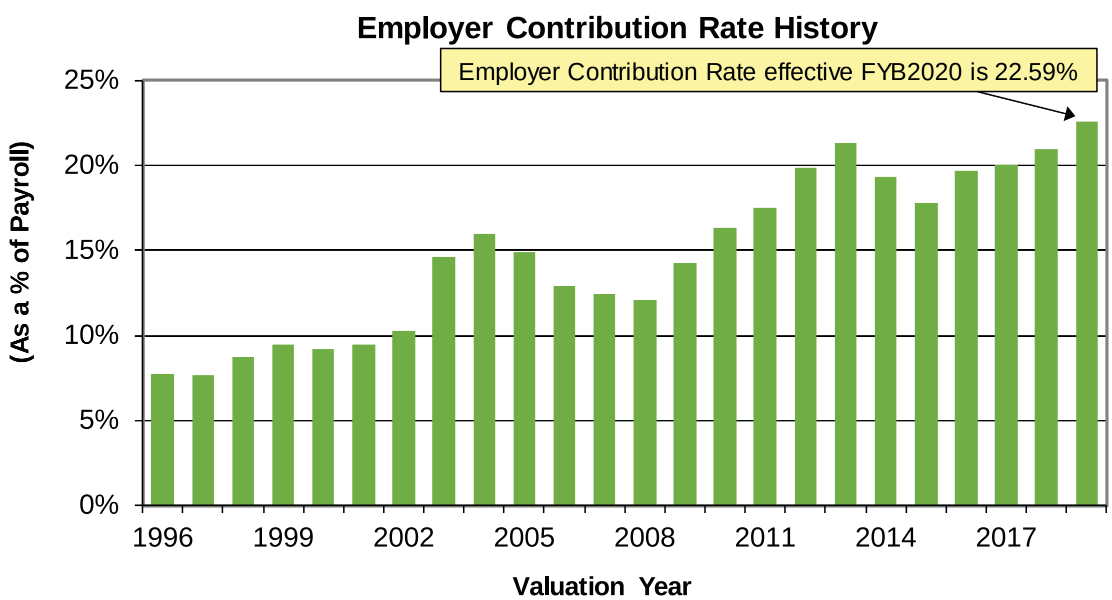


Funded Ratio

Over the past quarter century, LACERA has experienced two noticeable declines in Funded Ratio, both following periods of low investment returns: 1) after the Dot-com bubble; and 2) after the Great Recession.

Historical Employer Contribution Rates

The following graph shows how the employer contribution has varied over the last 25 years. Similar to the Funded Ratio history, the impact that investment returns have can be seen here. Significant increases in the employer contribution rate occurred following the dot-com bubble of the early 2000s and the Great Recession that started in 2008. The recent uptick in employer contribution rates has been primarily due to a combination of actual returns that were lower than assumed and a reduction in expectations for future returns, as reflected in the investment return assumption.



.

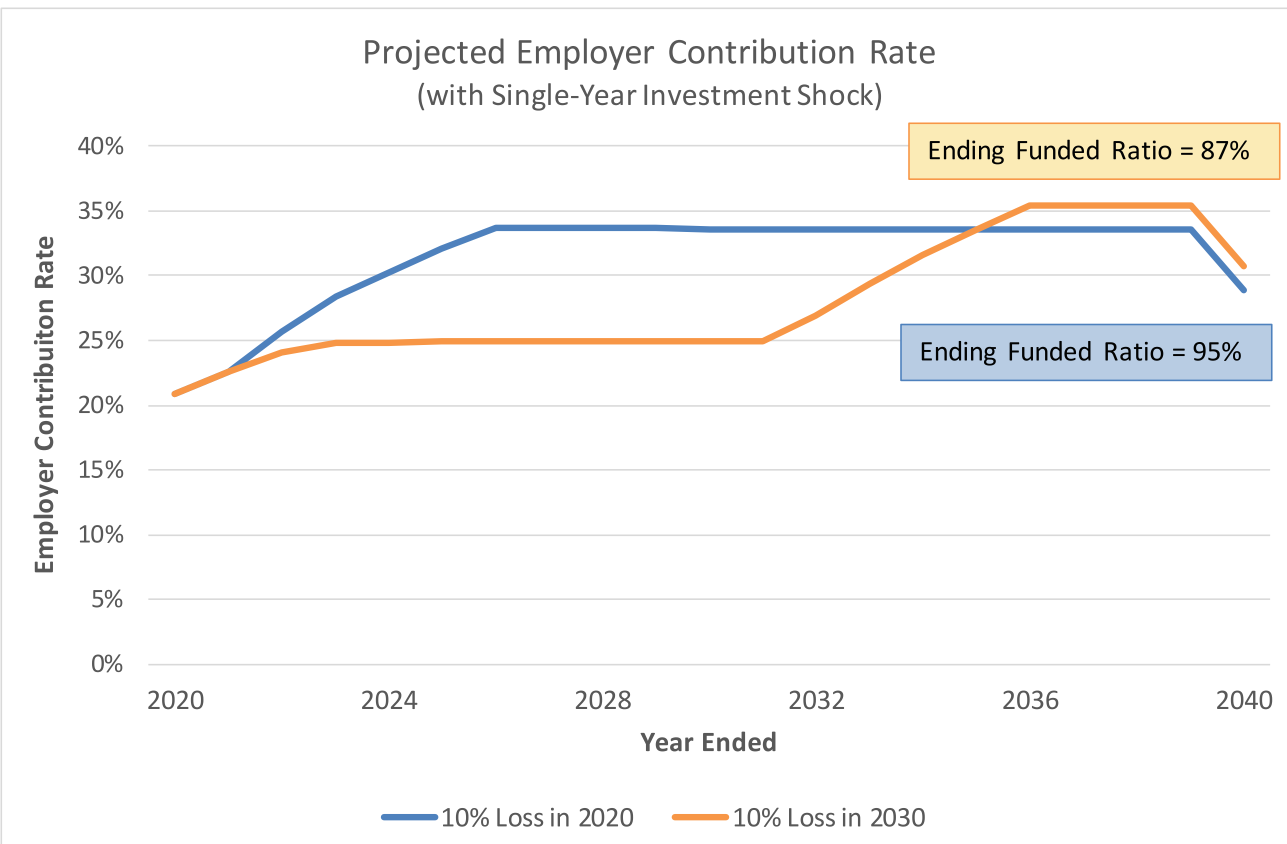
5. Assessment of Risks

The prior sections identified risks and discussed risk measures. This section quantifies the potential impact of several of the risks—investment risk, salary increase risk, payroll growth risk, and longevity risk—that could materially impact the employer contribution rate and Funded Ratio. In order to understand the extent of the risks faced, several stress tests were performed to determine the impact on employer contribution rates and funding levels. Although each risk was examined in isolation, the system has the potential to face these challenges in combination, which could have either an offsetting or compounding effect.

One-Time Investment Shock

The valuation assumes LACERA earns a constant 7% per year in the future. The reality is the actual return will vary from year to year. As shown in the Historical Measures section, LACERA's return has ranged from approximately -20% to 20% over the last 20 years. As previously discussed as a plan matures, it tends to become more sensitive to swings in the investment market.

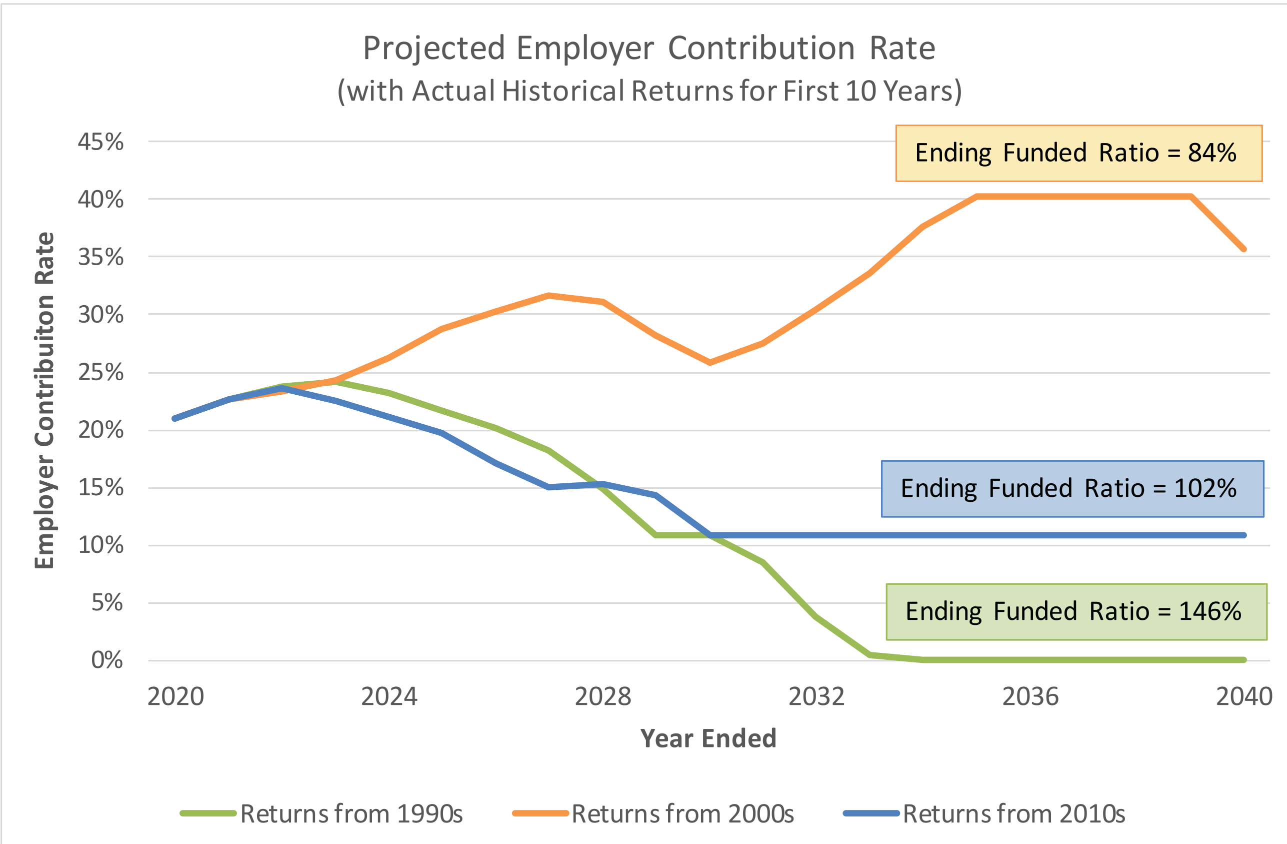
The following graph shows the potential impact of a -10% return on the employer contribution rate and Funded Ratio, if that return were to occur in the current fiscal year or 10 years from now. Based on LACERA's assumed 7.0% return and a standard deviation of 10.6%, there is a 4% probability that in any given year the investment return will be -10% percent or worse.



As expected due to the projected maturing of the plan in the future, the increase in the employer contribution rate is greater if the shock occurs 10 years from now (orange line) than if it occurs in the current year (blue line). However, the difference between the two scenarios is fairly small, as LACERA is already quite mature. The Funded Ratio is lower if the shock takes places 10 years from now, as the system's funding would have had less time to recover.

Historical Returns

Another way to look at the potential impact of future variance of returns is to look at what would happen if history repeats itself. The following graph shows the potential impact on the employer contribution rate and Funded Ratio, if LACERA's actual returns from the three previous decades were repeated. In each scenario, the returns from one of the decades is assumed to occur followed by an annual 7% return in the following years.



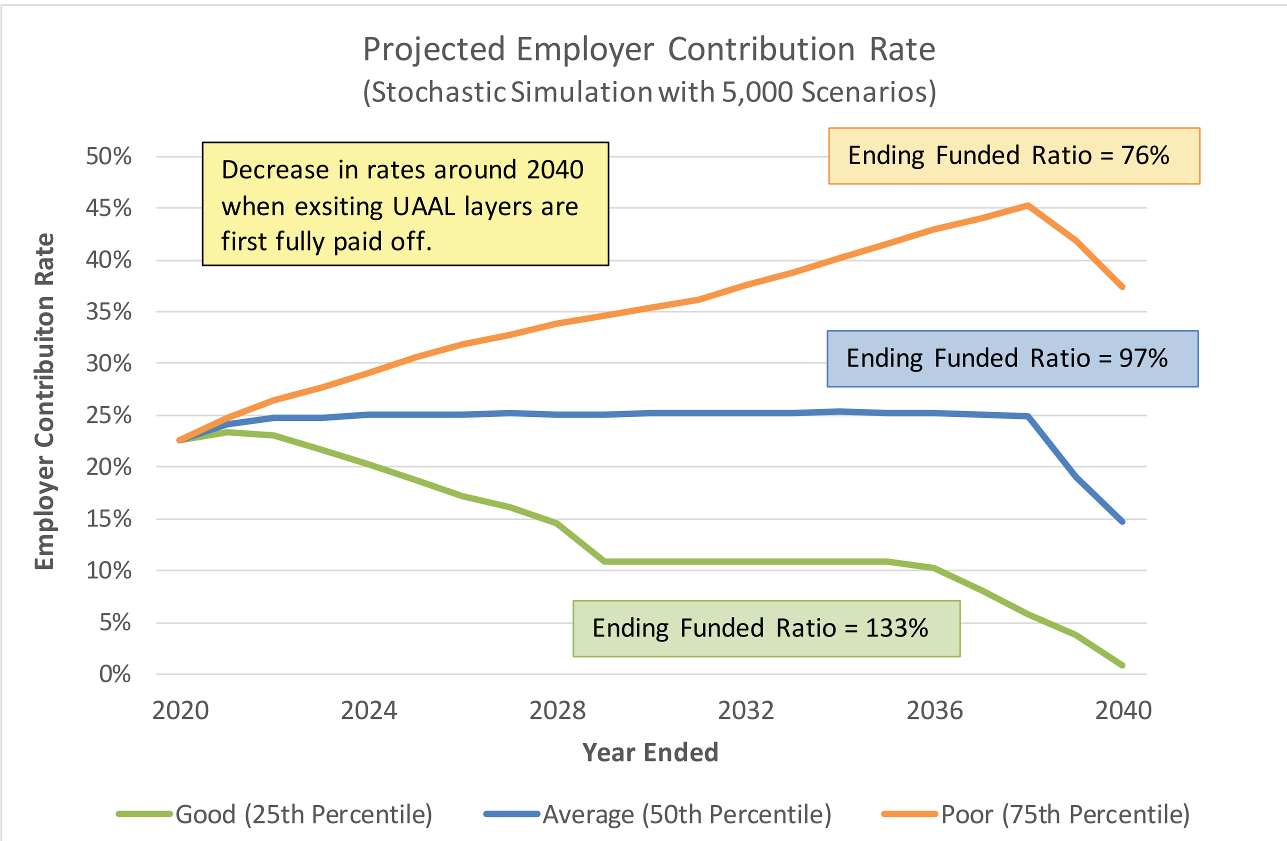
The potential variability of the employer contribution rate is evident with the projected rates varying from 40% of pay in 2000s scenario to 0% in the 1990s scenario. It should be noted that it is unlikely that the Returns from 1990s scenario (blue line) will recur, at least in the near future, as the strong returns were at least in part driven by a significant decline in interest rates, which given the current low interest rate environment does not seem likely. The significant increase in in the employer contribution under the Return from 2000s scenario (orange line) was caused primarily by the approximate -18% return for the fiscal year ended June 30, 2009. It does not reflect the recovery that occurred in the 2010s which, in reality, ultimately mitigated some of the impact.

Stochastic Analysis

The analyses above focused on deterministic scenarios based on a specific set of returns. To better understand how the variance of future returns could impact LACERA's funding , a stochastic model was used to generate 5,000 sets of Monte Carlo simulations based on LACERA's assumed 7.0% return and our estimate of the standard deviation of LACERA's target asset allocation of 10.6%.

Each of these 5,000 simulations represent a hypothetical future set of returns that could occur based on the assumed return and standard deviation. For each simulation, the assets and liabilities for the system were projected for the next 20 years. With this information it is possible to assess the potential impact of long-term investment performance and variance in funding levels.

The following graph shows the 25th, 50th, and 75th percentile of the projected funded status for LACERA. For example, the 75th percentile indicates that 75% of the results under the model were better (in the case of the employer contribution rate, lower than the green line) and 25% were worse. Combining a large number of scenarios in this type of analysis results in smooth lines, although the actual outcome will have more variability. Note that the compounded investment return over the 20-year period was just under 8.6% for the 25th percentile (above average) and just above 3.2% for the 75th percentile (below average).



The goal of these stochastic simulations is to provide a realistic estimate of the range of possible future outcomes. The stochastic analysis shows that the range between the 25th and 75th percentiles is quite large, illustrating the potential variance in future funding of the system. It should be remembered that half of the scenarios fall outside this range, with 25% of the scenarios being at or above the green line and 25% being at or below the blue line. Ideally, the range between the 25th and 75th percentiles for both measures would be narrower; however, there is a tradeoff between each of the two outcomes. To reduce the variance in the employer contribution rates would likely lead to an increase in the 50th percentile employer contribution rate and cause a wider range in the Funded Ratios. For example, when LACERA recently moved to 20-year amortization of future UAAL changes, this reduced the probability that the Funded Ratio would be low, but increased the probability the employer contribution rate would be higher.

The following charts show additional information regarding funding levels and employer contribution rates based on the stochastic analysis.

Funded Ratio after 20 Years	
Probability greater than 60%	94%
Probability greater than 80%	70%
Probability greater than 100%	46%

Employer Contribution Rate	
Annual probability total is > 30%(1)	32%
Annual probability increase is > 3%(2)	9%

1. Probability of total employer contribution rate exceeding 30% of payroll in any given year of 20-year projection period.

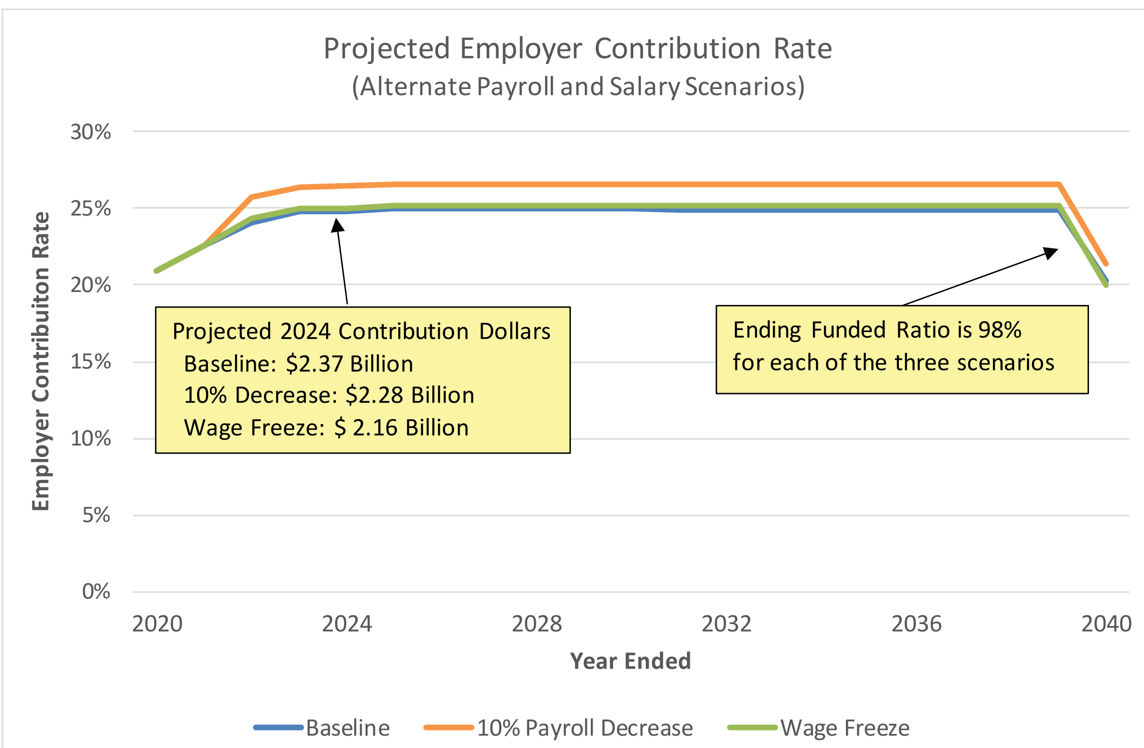
2. Probability of increase exceeding 3% of payroll in any given year of 20-year projection period.

Future Salary and Payroll Levels

Although, as previously discussed, we believe investment returns will have the largest impact on LACERA's future funding, there are other factors that will affect future funding levels. One example is payroll levels. As LACERA is funded as a percentage of payroll, a decline in payroll (or an increase less than the assumed annual increase of 3.25%) will result in the calculated percentage of payroll not being a sufficient dollar amount to pay off the UAAL on schedule, which will result in an increase in the UAAL portion of the employer contribution rate. That is, the same contribution dollars will still be needed to pay off the UAAL, but they will be a percentage of a smaller payroll. Note that a lower payroll is not expected to impact the Normal Cost rate, so a lower payroll would be expected to result in reduced employer Normal Cost contributions.

The following graph shows the impact on the employer contribution rate if the payroll is 10% less than assumed (orange line). For comparison, the baseline (blue line) shows the projected employer contribution rate assuming all assumptions are met. Under the decrease in payroll scenario, the employer contribution rate is about 1.5% higher than the baseline scenario. However, because the payroll is lower under the alternate scenario, the actual contributions in dollar terms projected to be paid would still be less.

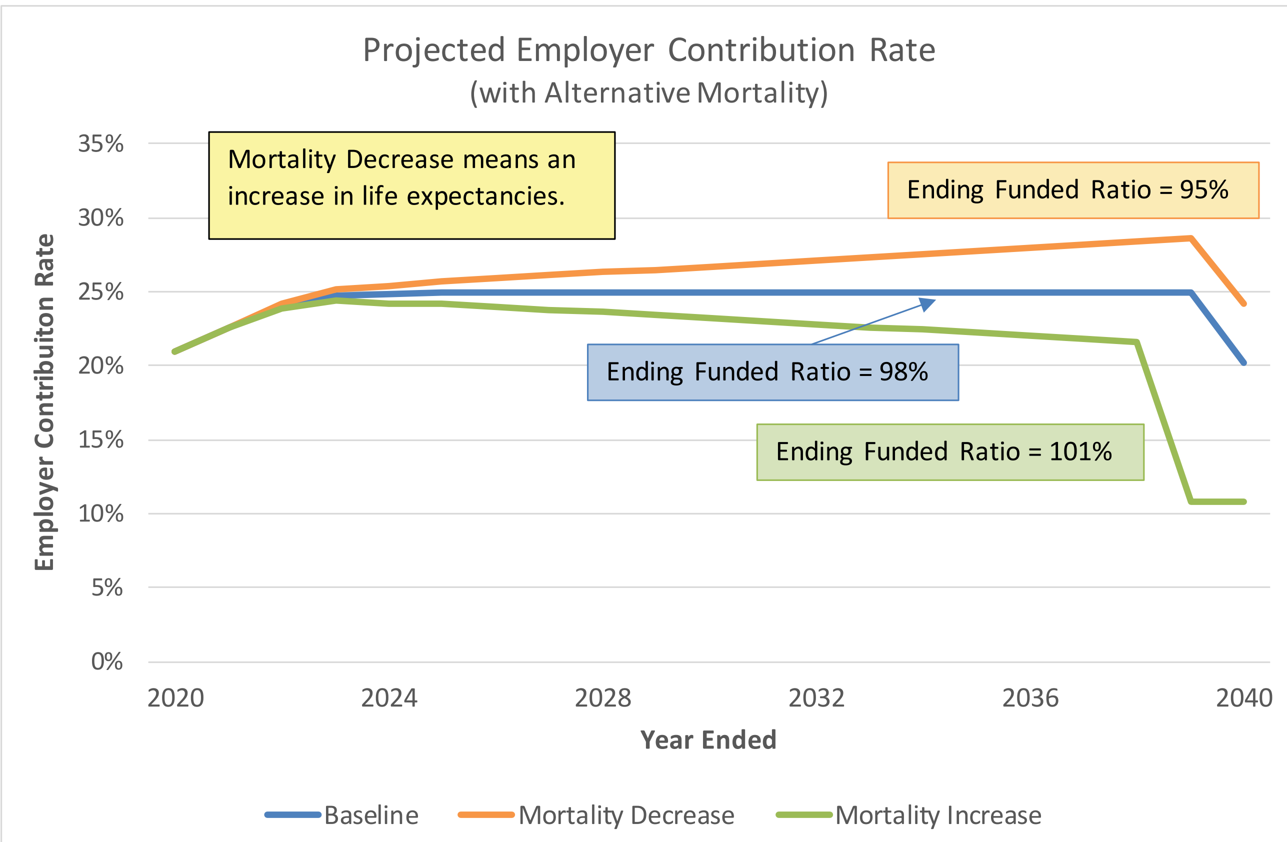
Lower-than-assumed increases in payroll can be caused by two factors: 1) a decline in active employee population; or, 2) compensation increases to current active employees that are less than assumed. The prior scenario assumed the 10% decrease in payroll was caused by a decline in the active population. If we assumed that the 10% decrease was caused by both an active population decline and lower-than-assumed compensation increases for active employees, the impact of the two factors would have a somewhat offsetting impact. The "Wage Freeze" scenario (green line) assumes that the payroll is 10% less than assumed in the next year, but part of this is caused by no compensation increases to current employees for one year. This type of scenario might be typical of an economic recession. As shown in the graph, the employer contribution rate is roughly the same as the baseline scenario. Note that for future years, increases in member compensation and payroll are assumed to revert to the assumed levels.



Mortality Risk

Unlike investment returns, mortality rates tend to be fairly consistent from year to year; however, over time mortality rates can shift materially. Historically, mortality rates have gradually declined, which has resulted in increasing life expectancies. LACERA's valuation anticipates a certain level of mortality improvement each year. To the extent future mortality is either better or worse than projected by the assumptions, the valuation results will be affected.

To quantify the potential impact of changes in mortality, the following graph shows a projection if in each future year 0.5% less (or more) of the total population died each year. For perspective, about 3% of LACERA's retiree population dies each year, so reducing the aggregate mortality rate from 3.0% to 2.5% is equivalent to a 1/6th decrease in the number of deaths each year. Over the last four years, the mortality gain on retirees has averaged about 0.05%, so the 0.5% reduction (or increase) is about a 10-fold increase in recent variance. This type of variance seems unlikely unless there was a significant outside factor, such as a medical breakthrough.



Assumption Risk

The prior analysis has focused on the impact of future experience deviating from the assumptions. As noted in Section 2 (Identification of Risk), one of the biggest factors in the increase in LACERA's UAAL over the last 20 years has been changes in actuarial assumptions, in particular changes in the investment return assumption. These changes are driven by expectations of future experience, and generally guided by the triennial Investigation of Experience study. The following table provides a simple analysis on how the short-term costs are affected by the investment return assumption. Note that the long-term cost of the Plan will be largely driven by actual investment returns and other experience; the assumptions used in the valuation impact the timing of the contributions over the long term.

	Investment Return Assumption		
	Current 7.00%	+0.5% 7.50%	-0.5% 6.50%
Employer Contribution Rate	22.59%	17.92%	27.50%
Change		-4.67%	4.91%
Funded Ratio	77.2%	82.1%	72.4%
Change		4.9%	-4.8%

(Attachment B)
Milliman’s October 14, 2020 Presentation Slides

LACERA

Risk Assessment

Based on June 30, 2019 Actuarial Valuation of Retirement Benefits

Mark Olleman, Nick Collier and Craig Glyde

OCTOBER 14, 2020

Milliman

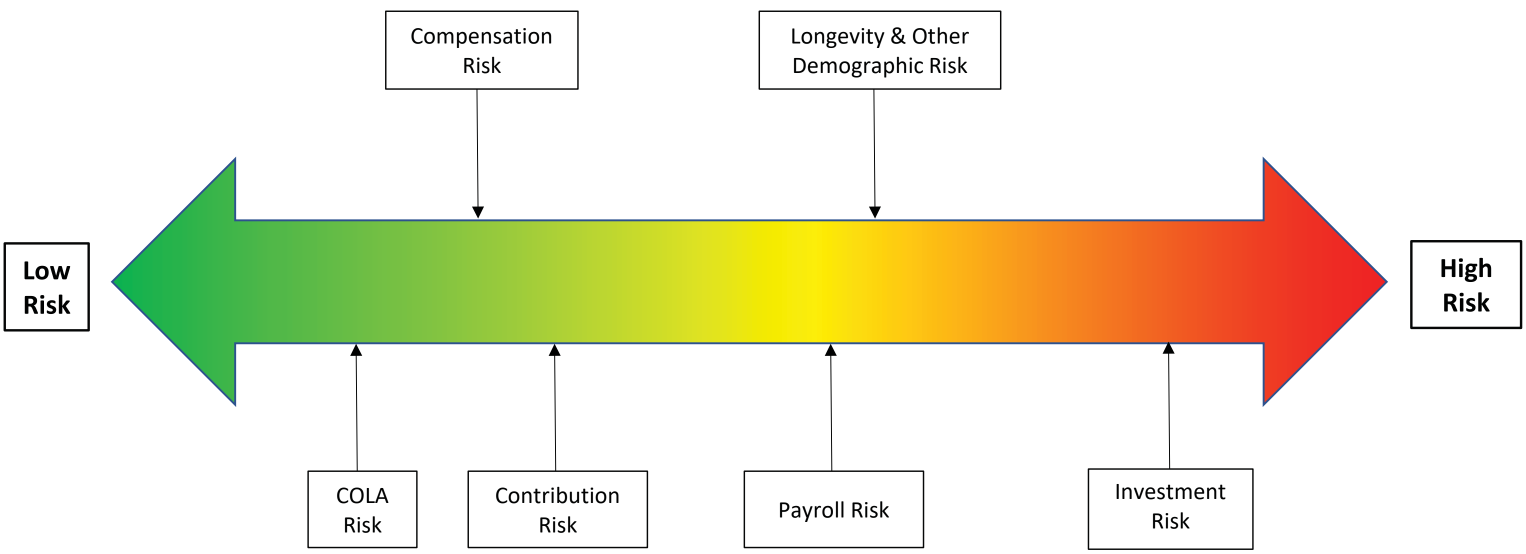
Introduction

- Valuations are based on one set of assumptions
  - Almost certain that future experience will differ from the assumptions
  - Important to consider the potential impacts of these likely differences when making decisions that may affect the future financial health of the plan
- The risk assessment is designed to give LACERA information on risks specific to future pension liability measurements and contribution levels
  - Identify risks that may be significant to the plan
  - Disclose plan maturity measures and historical information that are significant to understanding the plan's risk
  - Assess the risks identified as significant to the plan
- Guidance on risk assessment is provided in Actuarial Standard of Practice No. 51 (ASOP 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions)

Identification of Risks – Ranking

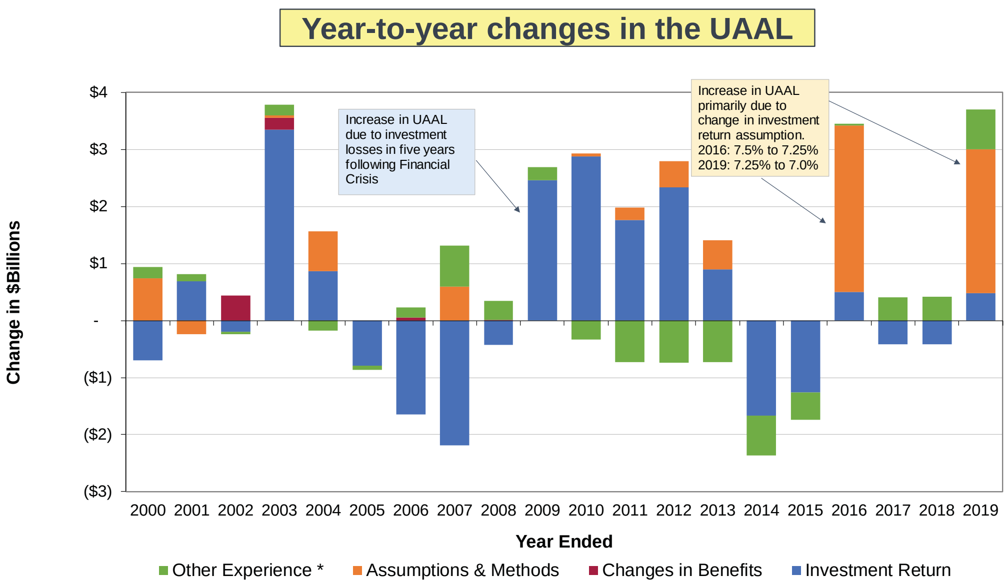
Risk: The potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

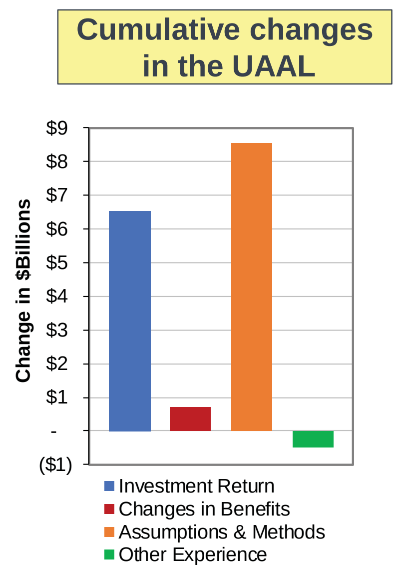
- We view future investment returns as the risk with the potential to have the greatest impact



Note: Above chart is based on Milliman's opinion and is not numerically based.

Identification of Risks – Historical Experience



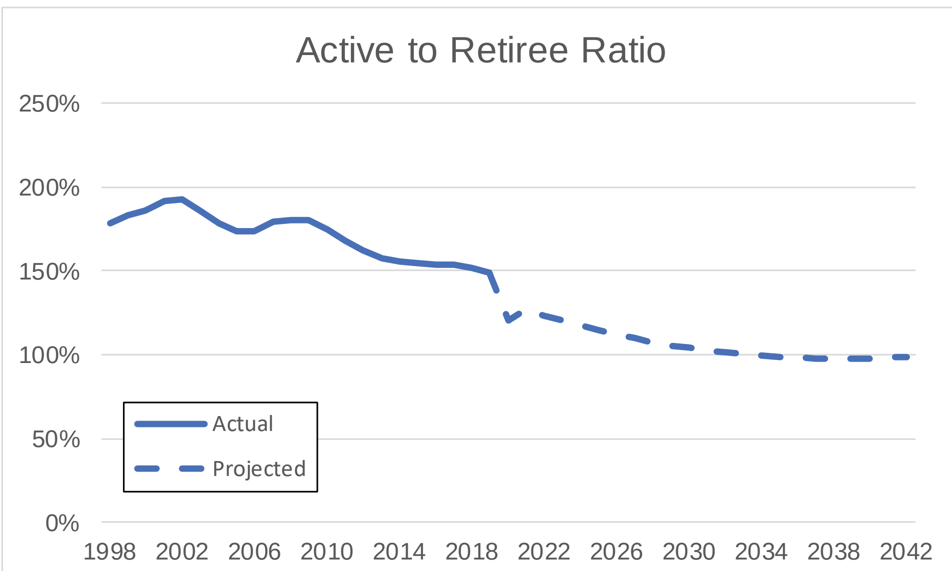


Milliman

** Other Experience includes changes due to Salary, CPI, Mortality and other factors.*

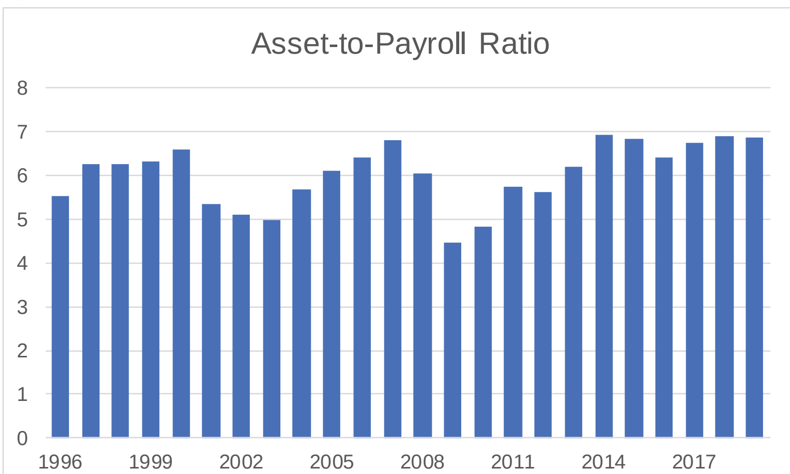
Plan Maturity Measures – Active to Retiree Ratio

- Mature plans are generally more susceptible to risk



Plan Maturity Measures – Asset Volatility Ratio

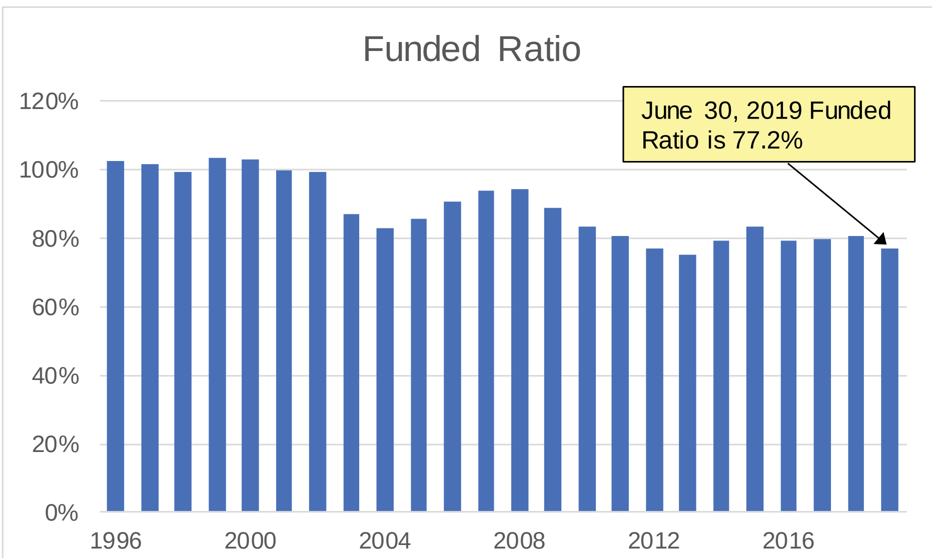
- Asset Volatility Ratio is ratio of assets relative to the plan's payroll
- LACERA has an Asset Volatility Ratio of 6.9; that is, assets are about 7 times as big as the payroll.
  - In practical terms, for each 1% the actual return is less than the assumed return, it causes a 0.47% of pay increase in the employer contribution rate.



Example: A 3% investment loss is 10% less than the assumed 7% return. Since assets are 7 times payroll, this means that a 10% actuarial asset loss is 70% of the payroll. Amortizing this over 20 years results in a 4.7% of pay increase in the employer contribution rate.

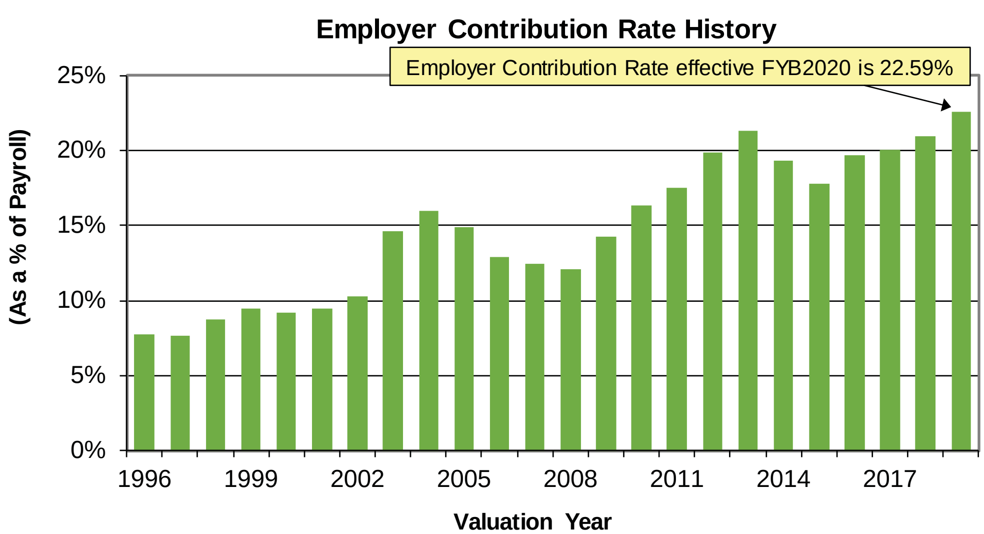
Historical Measures – Funded Ratio

- Funded Ratio has ranged from about 100% to 75% over last 20 years
  - Primary driver of increases of decreases has been investment returns



Historical Measures – Employer Contribution Rate

- Employer contribution rate has increased from less than 10% of pay to more than 20% of pay over last 20 years

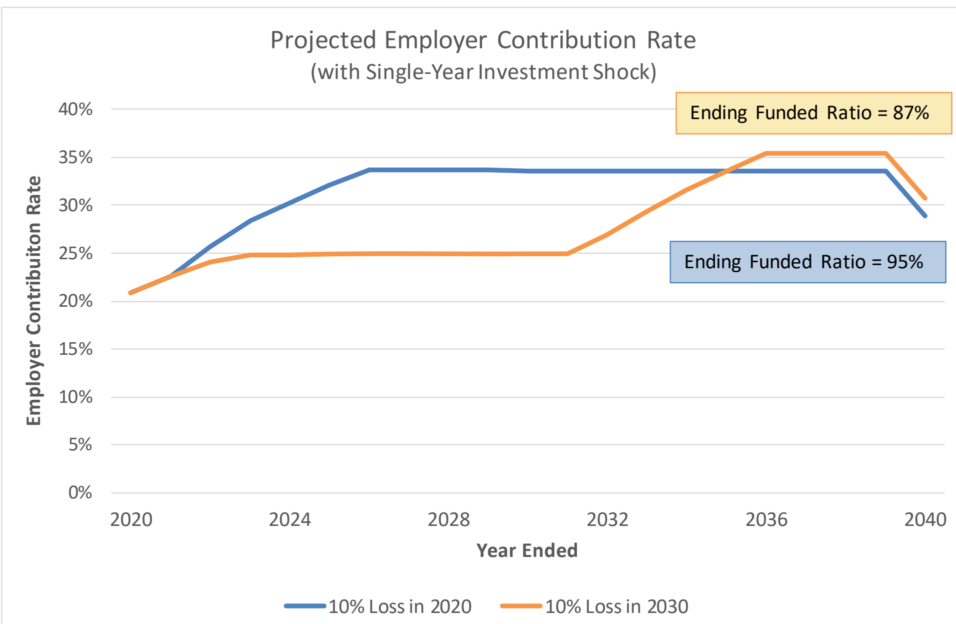


Assessment of Risks

- Potential impact of risks are assessed based on impact on LACERA's Funded Ratio and employer contribution rate
- Multiple scenarios were analyzed to give an idea of the potential deviation due to several factors
  - Investment return
  - Payroll / Compensation
  - Mortality

Assessment of Risk – Investment Return (1-Year Shock)

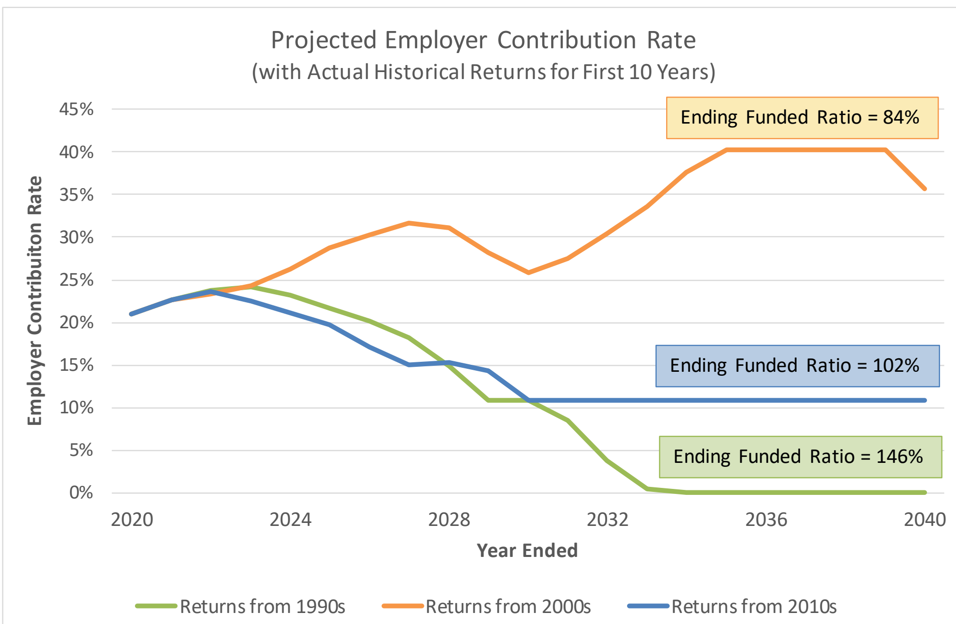
- Investment loss causes a greater increase in the employer contribution rate as LACERA matures



Milliman

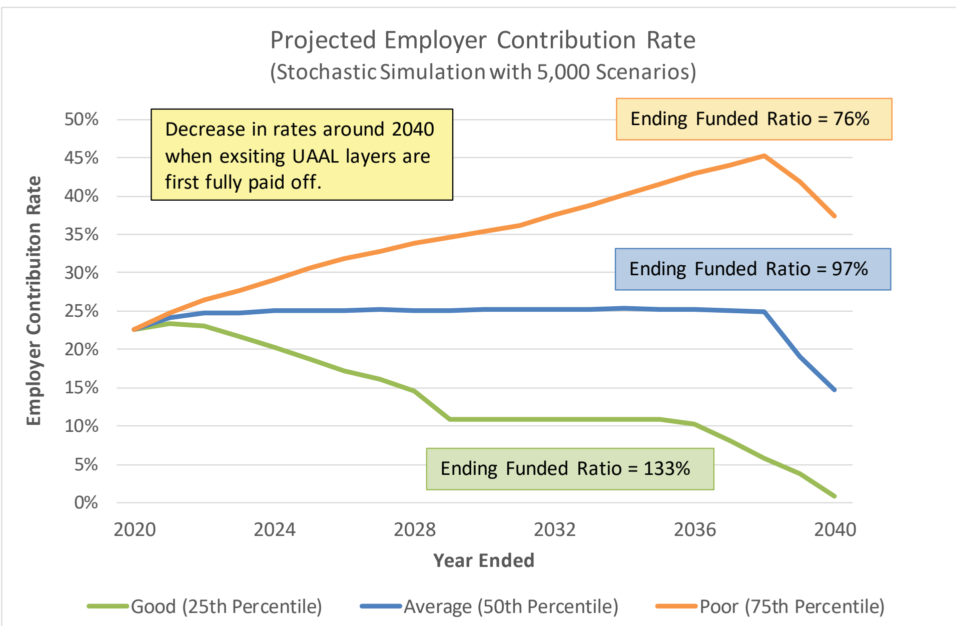
Assessment of Risk – Historical Investment Returns

- If returns from recent decades were to recur, projected results vary significantly



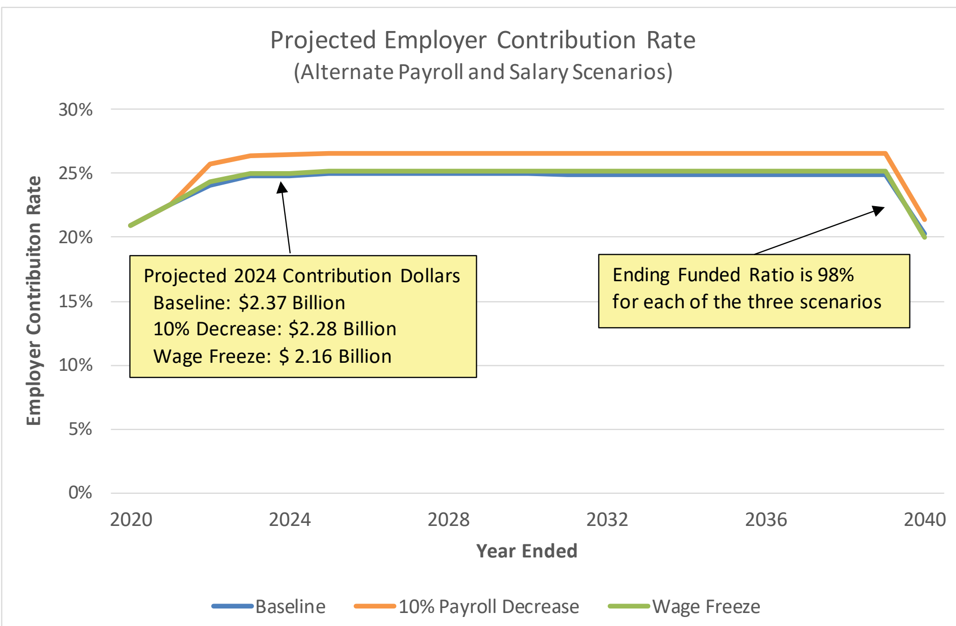
Assessment of Risk – Stochastic Analysis of Returns

- Probability of future outcomes based on standard deviation of asset allocation



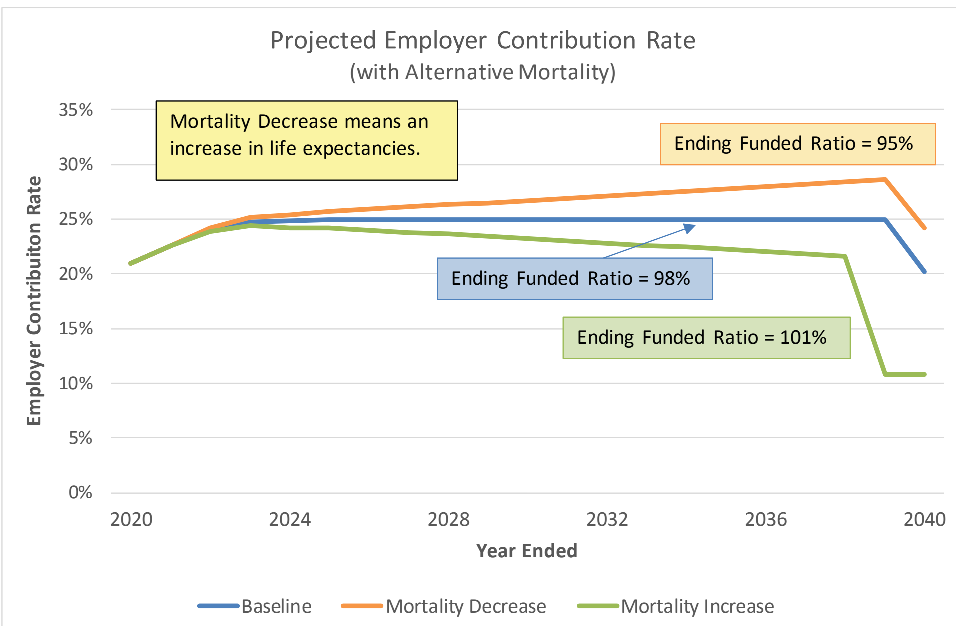
Assessment of Risk – Compensation and Payroll

- Decrease in payroll could materially affect employer contribution as a percentage of pay



Assessment of Risk – Mortality Different than Assumed

- Impact of mortality unlikely to have same impact as investment experience, but can add up over time



Assessment of Risk – Contribution Risk

- Primary contribution risk = Employers not making required contribution
  - For some retirement systems, a significant source of their underfunding has been the plan sponsor not making the actuarially determined contribution
- We have not assessed risk of employers not making required contribution
  - County and other employers have consistently made the actuarially determined contribution in the past
  - There are legal requirements specified in the 1937 Act that govern future contributions
  - If the County does not make its full contribution in the future, it could present a significant risk to LACERA's funding
- Secondary contribution risk = Pushing contributions into the future
  - Contribution increases due to assumption changes have been phased in instead of recognized immediately
  - The STAR Reserve is included in assets, but STAR liabilities are not
  - The County has a history of reflecting contribution rate decreases as soon as possible (July) and deferring increases as late as possible (September)

Addressing Risk

- LACERA's Current methods to address risks are:
  - **Assets:** LACERA regularly performs asset allocation studies which are integrated with LACERA's funding in order to set a target allocation that maximizes return at a level of risk that is acceptable to the system.
  - **Liabilities:** LACERA has regular investigations of experience performed to monitor and set the assumptions and methods used to calculate the liabilities.
  - **Funding:** LACERA strives to balance projected funding levels with reasonable and stable employer contribution rates. In particular, to strengthen long-term funding LACERA recently reduced the amortization period to pay off new unfunded amounts to 20 years. To help stabilize year-to-year changes in the employer contribution rate, a five-year asset smoothing period is used.
- Reducing risk generally creates a tradeoff
  - Moving from equity to fixed income generally lowers the risk of a poor single-year return, but also reduces the expected long-term investment return. This reduction in expected future income will likely result in the need for additional contributions.
  - A lower investment return assumption reduces the likelihood and magnitude of investment losses, but it also increases the member and employer contribution rates.
  - Moving to a 20-year layered amortization improved LACERA's projected long-term funding, but also increased the expected year-to-year variability of the employer contribution rate.

Update on Actuarial Standards of Practice (ASOPs)

- In July the Actuarial Standards Board adopted revised ASOPs for:
  - ASOP No. 27 “Selection of Economic Assumptions for Measuring Pension Obligations”
  - ASOP No. 35 “Selection of Demographic and other Noneconomic Assumptions for Measuring Pension Obligations.”
- Although ASOPs 27 & 35 are important ASOPs the changes are not expected to have any impact on LACERA. The most notable changes were:
  - The combined effect of all assumptions should not be biased.
  - If assumption changes are phased in, the intermediate steps should all be reasonable on their own.
  - Both of these changes are consistent with our advice, and the Board’s actions in adopting assumptions.
- Second draft of ASOP No. 4 (Measuring Pension Obligations) was discussed with BOI in March
  - It seems likely the “Low Default Risk Obligation Measure” or LDROM will be maintained.
  - The LDROM requires additional disclosure of liabilities measured at high quality bond rates.
  - The LDROM does not change contribution calculations, or GASB measurements.
  - This could be effective as early as the 6/30/2022 valuation.

Conclusion

- As a mature plan, LACERA is subject to a number of risks which could ultimately affect the Funded Ratio and employer contribution rate
  - Investment returns have historically had the greatest impact and this is likely to continue
- LACERA has several mechanisms in place to address risks, but they can only mitigate risks, not eliminate them
  - Reducing risks generally creates a tradeoff
- Continue to monitor risks and consider areas where additional risk mitigation may be appropriate

Questions

Caveats and Disclaimers

This presentation is based on the data, methods, assumptions and plan provisions described in our risk assessment report dated August 31, 2020. The statements of reliance and limitations on the use of this material is reflected in the actuarial report and still apply to this presentation.

These statements include reliance on data provided, on actuarial certification, and the purpose of the report.

Milliman's work product was prepared exclusively for LACERA for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning LACERA’s operations, and uses LACERA’s data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

(Attachment C)
June 30, 2019 Actuarial Valuation of Retirement Benefits Report

Los Angeles County Employees Retirement Association

Actuarial Valuation of Retirement Benefits

June 30, 2019

Prepared by:

Mark C. Olleman, FSA, EA, MAAA
Consulting Actuary

Nick J. Collier, ASA, EA, MAAA
Consulting Actuary

Craig Glyde, ASA, EA, MAAA
Consulting Actuary

Milliman, Inc.
1301 Fifth Avenue, Suite 3800
Seattle, WA 98101-2605
Tel +1 206 624 7940
milliman.com

Issued March 2, 2020

1301 Fifth Avenue
Suite 3800
Seattle, WA 98101-2605
USA

Tel +1 206 624 7940
Fax +1 206 623 3485

milliman.com

March 2, 2020

Board of Investments
Los Angeles County Employees Retirement Association
300 North Lake Avenue, Suite 820
Pasadena, CA 91101-4199

Re: **Los Angeles County Employees Retirement Association**

Dear Members of the Board:

As requested, we have performed an actuarial valuation of retirement benefits for the Los Angeles County Employees Retirement Association (LACERA) as of June 30, 2019 to be used in determining the contribution rates effective July 1, 2020. The major findings of the valuation are contained in this report. This report reflects the benefit provisions and contribution rates in effect as of June 30, 2019, and LACERA's Funding Policy that was adopted in December of 2009 and amended as of February 2013. It should be noted that under the amended Funded Policy, the reserve value for STAR benefits is included in the Valuation Assets for 2014 and future valuations; however, the liability for any potential STAR benefits that may be granted in the future is not included in this valuation.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by LACERA's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for LACERA have been determined on the basis of actuarial assumptions and methods that are individually reasonable (taking into account the experience of LACERA and reasonable expectations); and that, in combination, offer a reasonable estimate of anticipated experience affecting LACERA. Further, in our opinion, each actuarial assumption used is reasonably related to the experience of the Plan and to reasonable expectations, which, in combination, represent a reasonable estimate of anticipated experience for LACERA.

This valuation report is only an estimate of LACERA's financial condition as of a single date. It can neither predict LACERA's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of benefits, only the timing of contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement, although for informational purposes we have shown valuation results at +/- 0.5% on the investment return assumption at the end of the Executive Summary.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The Board of Investments has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix A of this report.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts of LACERA. The calculations in the enclosed report have been made on a basis consistent with our understanding of LACERA's funding requirements as stated under their Funding Policy, with a modification to reflect the three-year phase-in of the employer contribution rate change due to the new assumptions. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes. Milliman will provide LACERA financial reporting results relevant to GASB Statements No. 67 and 68 in separate reports.

Milliman's work is prepared solely for the internal business use of LACERA. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

(a) LACERA may provide a copy of Milliman's work, in its entirety, to LACERA's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit LACERA.

(b) LACERA may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are retirement actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsors. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

We would like to express our appreciation to members of LACERA staff who gave substantial assistance in supplying the data on which this report is based.

We respectfully submit the following report, and we look forward to discussing it with you.

Sincerely,

Mark Olleman, FSA, EA, MAAA
Consulting Actuary

Nick Collier, ASA, EA, MAAA
Consulting Actuary

Craig Glyde, ASA, EA, MAAA
Consulting Actuary

Table of Contents

Appendices

1. Summary of Findings

2019 Valuation Results

	Fiscal Year Beginning	
	July 1, 2020	July 1, 2019
Employer Contribution Rate with phase-in	22.59% [(1)]	20.91% [(2)]
Funded Ratio	77.2%	80.6%

1. *The FYB 2020 employer contribution rate was calculated in the June 30, 2019 valuation. The FYB 2020 employer contribution rate without phase-in is 24.78%.*
2. *The FYB 2019 employer contribution rate was calculated in the June 30, 2018 valuation.*

This report presents the results of the June 30, 2019 actuarial valuation. This valuation determines the required contribution rates payable starting July 1, 2020. Several key points are summarized below:

Funding: The Funded Ratio decreased from 80.6% to 77.2% primarily due to the assumption changes (including a reduction in the investment return assumption) effective with the June 30, 2019 valuation, which caused a decrease of 2.8% in the Funded Ratio. Recognition of current and prior year asset losses caused a 0.7% decrease. On a market-value basis, the Funded Ratio decreased from 81.3% to 77.3%.

The “Analysis of Change” section that follows later in Section 1 provides an analysis of the sources of change in the Funded Ratio since last year.

Investment Returns: For the fiscal year ending in 2019, the fund returned 5.5% on a market-value basis (net of investment expenses). In total, there was an $755 million loss on market assets relative to the assumed rate of return of 7.25%. Under the actuarial asset method, which recognizes investment gains and losses over a five-year period, the return on actuarial assets was 6.5%, equivalent to a loss of $477 million relative to the assumed return of 7.25%.

Employer Contribution Rates: The total calculated employer contribution rate increased from the prior valuation by 1.68% (from 20.91% to 22.59%) of payroll. The increase in the employer contribution rate is primarily due to the assumption and amortization method changes effective June 30, 2019 and the recognition of current and prior year investment losses.

At the January 2020 Board of Investments (BOI) meeting, the BOI adopted a three-year phase-in of the increase in the employer contribution rate due to the new assumptions and amortization method. Without the phase-in of the increase, the total employer contribution rate would be 24.78% effective July 1, 2020. The remaining 2.19% increase due to the new assumptions and amortization method (24.78% minus 22.59%) will be phased-in equally effective July 1, 2021 and July 1, 2022.

The “Analysis of Change” section provides an analysis of the sources of change in employer contribution rates since last year. In addition, the section “Projected Future Employer Contribution Rates” below shows a 10-year projection of employer contribution rates.

Member Contribution Rates: New member contribution rates are recommended for all Plans effective July 1, 2020, based on the new assumptions adopted with the 2019 Investigation of Experience. Member contribution rates for all plans, except General Plans E and G and Safety Plan C, vary based on a member’s entry age to LACERA and the underlying actuarial assumptions. General Plan G and Safety Plan C member rates are required to be equal to 50% of the Gross Normal Cost of the respective plan.

The recommended member contribution rates are higher for all Plans and all members, except the non-contributory General Plan E. Member contribution rates are discussed in detail in Section 5 of this report.

Economic and Demographic Assumptions

The assumptions developed as a result of the 2019 Investigation of Experience study, described in our report dated January 28, 2020, were adopted by the BOI for use in this valuation. These changes include lowering the investment return assumption from 7.25% to 7.00%, increasing the rates of assumed merit salary increases (primarily for Safety members), and updating mortality tables to the public plan specific tables published in 2019 by the Society of Actuaries Retirement Plans Experience Committee (RPEC). Of these changes, the reduction in the investment return assumption had the greatest impact on the results of this valuation.

The net effect of all the assumption changes was an increase in the Unfunded Actuarial Accrued Liability (UAAL) of approximately $2.5 billion effective June 30, 2019, a decrease in the Funded Ratio of 2.8%, and an increase in the employer contribution rate of 3.29% of payroll (without phase-in).

Member contribution rates for all Plans also increased due to the new assumptions.

Amortization of the UAAL

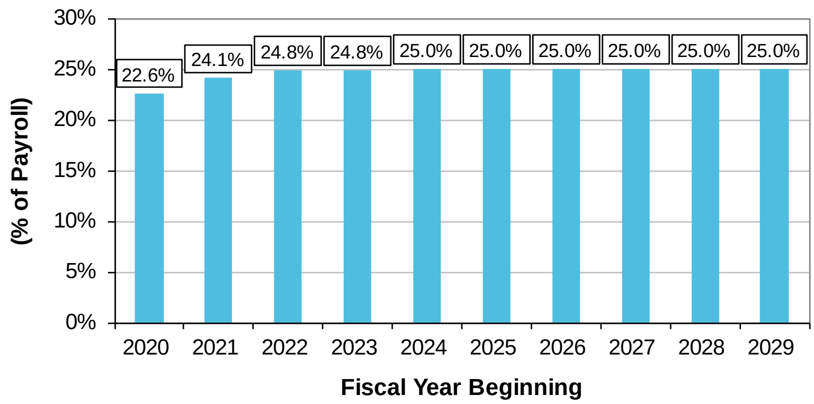
LACERA employs a “layered” amortization method to pay off the UAAL. Under this method, the UAAL amount as June 30, 2009 was amortized over a closed 30-year period. Subsequent changes in the UAAL were amortized over new closed 30-year periods. Effective with the June 30, 2019 valuation, all existing layers with more than 22 years remaining were re-amortized over closed 22-year periods. All new UAAL layers are amortized over a 20-year period, beginning with the date the contribution is first expected to be made. Exhibit 12 of this report illustrates in detail the calculation of the total UAAL rate for the fiscal year beginning in 2020.

Projected Future Employer Contribution Rates

The employer contribution rate beginning July 1, 2020 is 22.59% of payroll, which is a weighted average for all LACERA plans. The actual percent of payroll to be contributed by the employers varies by plan as shown in Exhibit 11.

The new calculated employer contribution rate is effective for the fiscal year beginning July 1, 2020. Additional increases are projected over the next two years as the increase due to assumption and method changes is phased in. Even if all actuarial assumptions are met over the next few years, we project additional modest changes in the employer contribution rate as deferred asset gains and losses are recognized. To illustrate these impacts, we have performed a 10-year projection of the employer contribution rate that assumes all actuarial assumptions are met, and reflects the phase-in and the projected recognition of the remaining deferred asset gains and losses as of June 30, 2019. This projection is shown in the graph below.

Projected Employer Contribution Rate(1)



1. Projections assume that all actuarial assumptions are met after June 30, 2019, and reflect the scheduled recognition of asset gains and losses currently being deferred. Actual results will vary.

Analysis of Change

The following table shows an analysis of the primary causes of the change in the employer contribution rate and the Funded Ratio over the last year. The impact of the assumption and amortization method changes was the most significant factor affecting the employer contribution rate, although this was somewhat mitigated by the three-year phase-in of this increase.

Sources of Change	Employer Contribution Rate	Funded Ratio
June 30, 2018 Actuarial Valuation	**20.91%**	**80.6%**
Expected Year-to-Year Change	0.00%	0.7%
Assumption and Method Changes	3.29%	-2.8%
Recognized Asset Gain/Loss		
From Current Year	0.17%	-0.3%
From Prior Years	0.25%	-0.4%
Combined Asset Gain/Loss	0.42%	-0.7%
Contributions > Assumed	-0.09%	0.2%
Payroll Increase > Assumed	-0.14%	0.0%
Liability Gain / Loss		
Salary Increase > Assumed	0.43%	-0.5%
Retiree COLAs > Assumed	0.04%	-0.1%
Other	-0.08%	-0.2%
Combined Liability Gain/Loss	0.39%	-0.8%
Deferred Recognition of 2019 Assumptions	-2.19%	0.0%
Total Change	**1.68%**	**-3.4%**
June 30, 2019 Actuarial Valuation	**22.59%**	**77.2%**

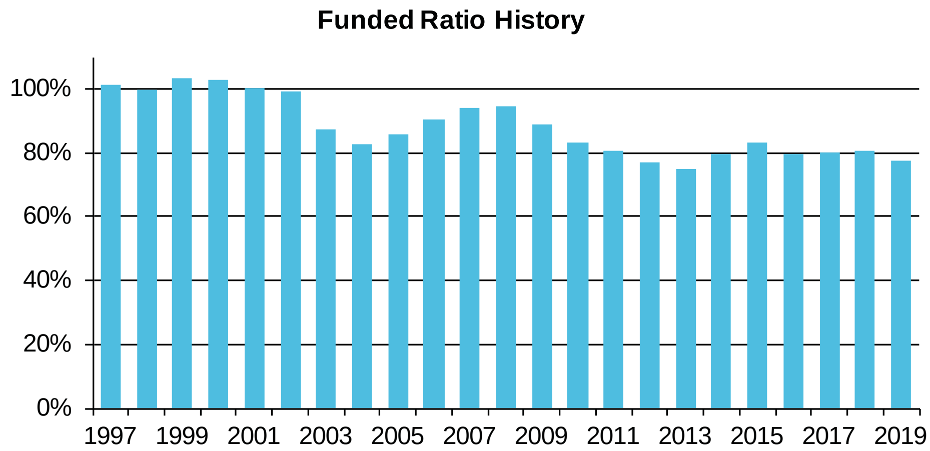
Based on the 2018 valuation, the expected UAAL as of June 30, 2019 was $13.4 billion. The actual UAAL as of June 30, 2019 is $17.0 billion. The additional UAAL is primarily due to the new assumptions adopted by the Board of Investments effective June 30, 2019 and the recognition of actuarial asset losses from the current and prior years. An analysis of the difference between expected and actual UAAL is shown in Exhibit 8a.

Funding Progress

One measure of the funding adequacy of the system is the Funded Ratio, which compares the Valuation Assets (the actuarial value of assets net of certain non-valuation reserves) to the Actuarial Accrued Liability (AAL). The Funded Ratio shown in this valuation is appropriate for assessing the future contributions needed. However, it is not appropriate for assessing the sufficiency of current system assets to cover the estimated cost of settling the system's accrued benefit obligations. As shown in Exhibit 1, the Funded Ratio is different depending on whether the Market Assets or Valuation Assets is used.

As shown in the graph that follows, the Funded Ratio was 94.5% as of June 30, 2008, but decreased steadily over the five-year period following the economic downturn to a low of 75.0% as of June 30, 2013 as asset losses were gradually recognized. The Funded Ratio has gradually increased since that time, although this increase has been slow as the Board has strengthened the actuarial assumptions over the period, thereby increasing the AAL and offsetting some of the increase in the Funded Ratio from other sources.

A historical perspective of the Funded Ratio is shown in the following chart.



Assets

On June 30, 2019, the market value of the fund (including non-valuation reserves) was $58.3 billion. The actuarial value of assets was $58.2 billion, split between $0.6 billion of Non-Valuation Assets and $57.6 billion of Valuation Assets. The actuarial value of assets is approximately 100% of the market value of assets.

On a market-value basis, for the fiscal year ended June 30, 2019, LACERA earned 5.5% net of investment expenses, as reported by LACERA in the June 30, 2019 CAFR. The market value of assets is used in calculating the actuarial value of assets. Under the actuarial asset method, investment gains and losses are recognized (or smoothed in) over a five-year period. Due to the recognition of current and deferred net asset losses, the return on the actuarial valuation of assets is 6.5% net of investment and administrative expenses, and is less than the assumed return for the prior year of 7.25%.

Valuation Assets are used in the calculation of the UAAL contribution rate and Funded Ratio. Valuation Assets are equal to the actuarial value of assets less certain non-valuation reserves. The Valuation Assets of $57.6 billion are equal to 77.2% of the $74.6 billion AAL.

The non-valuation reserves are set aside for obligations or contingencies. They are not used to fund the retirement benefits unless explicitly stated. As of June 30, 2019, the non-valuation reserves include only the Contingency Reserve, which is equal to 1% of the market value of assets, or $563 million. Note that the Contingency Reserve affects the assets used in the actuarial valuation and is not part of the accounting process used in creating the financial statements.

Under LACERA's Funding Policy, the reserve value for STAR benefits is included in the Valuation Assets; however, the liability for any STAR benefits that may be granted in the future is not included in the valuation. Note that if the STAR reserve of $614 million was excluded from the Valuation Assets, the UAAL would increase by this amount. Under this hypothetical scenario, the calculated employer contribution rate for the fiscal year beginning July 1, 2020 would increase by 0.52% of payroll, and the Funded Ratio would decrease by 0.8% to 76.4%.

Future Impact of Recognition of Deferred Gains/Losses

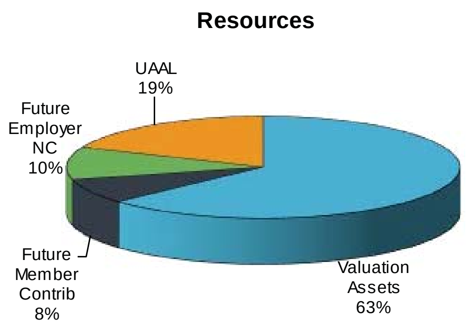
The smoothing method is currently deferring $95 million in net asset gains. As the currently deferred gains and losses are recognized over upcoming valuations, it is projected there will be fluctuations in the calculated employer contribution rate.

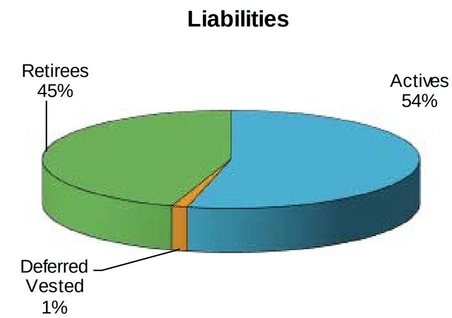
The potential future impact of the recognition of these deferred gains and losses on the projected employer contribution rate is included in the graph on page 3.

Actuarial Balance Sheet

The first step in the valuation process is to compare the total actuarial assets of LACERA with its total liabilities for all plans. In this analysis, assets are those currently on hand at the actuarial value and also include expected future contributions by both the employers and members. Liabilities reflect benefits already earned in the past and those expected to be earned in the future by current members. This relationship is shown in the pie charts below. The AAL is the total of these liabilities less expected future Normal Cost contributions.

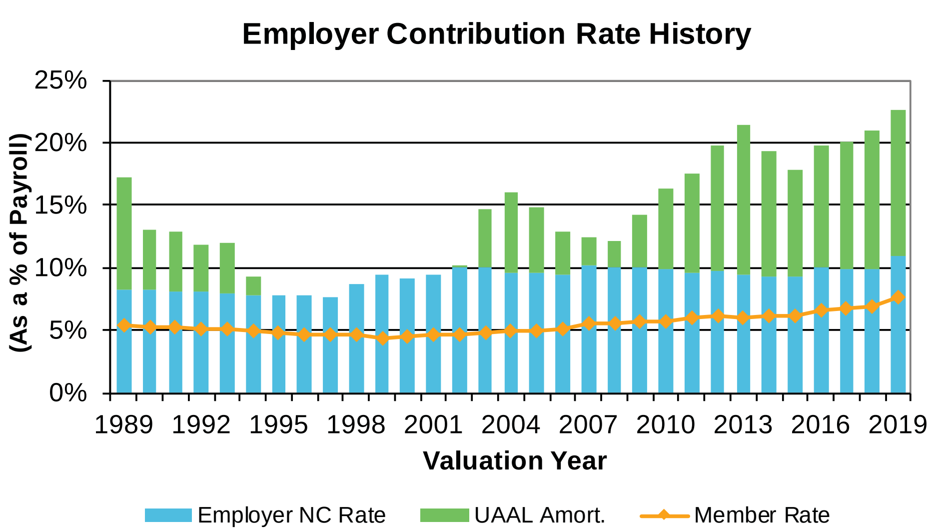
The 2019 actuarial valuation indicates that LACERA's Valuation Assets are less than its AAL. The difference between these two values is the UAAL. It is discussed, along with the effect of the experience gains and losses, in detail in Section 4, Actuarial Liabilities.





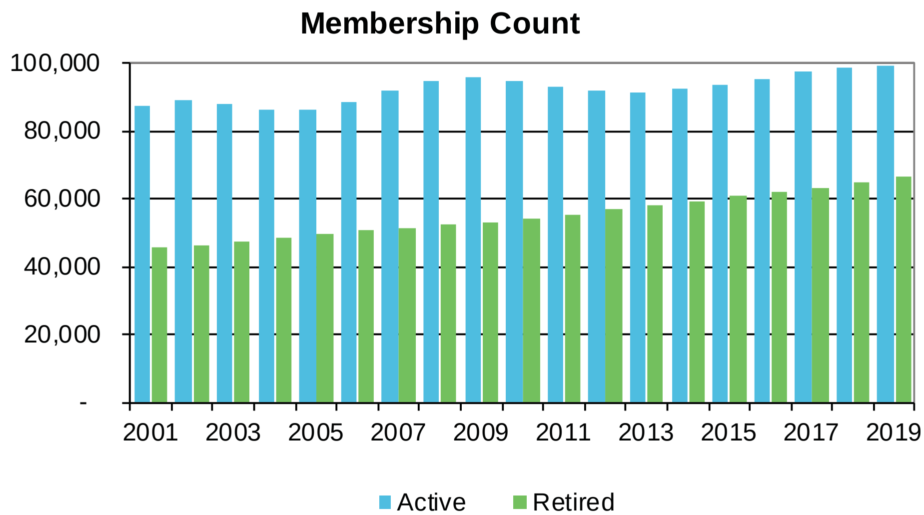
Employer Contribution Rate History

Based on the results of the valuation, the calculated employer contribution rate will increase for the fiscal year beginning in 2020 to a rate of 22.59% of pay. A historical perspective of the employer contribution rates is shown in the following graph.

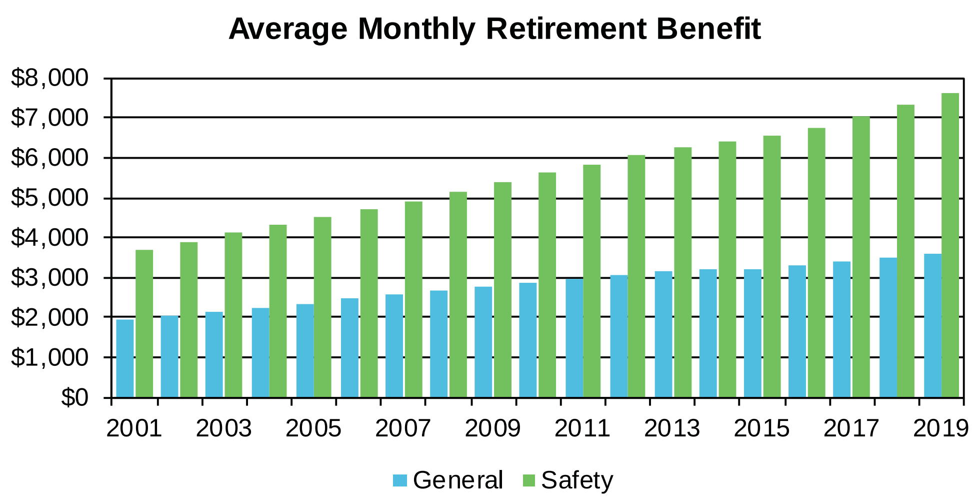


Member Information

Active membership and payroll have each increased since 2018. As of June 30, 2019, the annualized payroll is $8.4 billion for 99,186 active members. This reflects a 3.5% increase in average member pay and a 0.7% increase in the number of active members.



Retired member counts and average retirement benefit amounts continue to increase steadily. For 2019, there were 66,507 retired members and beneficiaries with an average benefit of $4,385 per month. This represents a 2.5% increase in count and a 3.6% increase in the average monthly benefit.



Analysis of Change in Member Population

The following table summarizes the year-to-year change in member population.

	Active Members	Inactive Members	Service Retired Members	Disabled Retired Members	Beneficiaries in Pay	Total
As of June 30, 2018	**98,474**	**14,906**	**46,296**	**9,707**	**8,877**	**178,260**
New Members	5,417	178	18		747	6,360
Status Change:						
to Active	128	(128)				-
to Inactive	(1,476)	1,476				-
to Service Retirement	(2,527)	(437)	2,964			-
to Disabled Retirement	(241)	(8)	(238)	487		-
Refunds	(367)	(414)				(781)
Terminated non-vested	(50)					(50)
Benefits Expired			(10)		(6)	(16)
Deaths	(172)	(6)	(1,513)	(303)	(519)	(2,513)
As of June 30, 2019	**99,186**	**15,567**	**47,517**	**9,891**	**9,099**	**181,260**

Note: Inactive Members include non-vested former members who have not taken a refund of their contributions.

Sensitivity to Investment Return

The valuation results are projections based on the actuarial assumptions. Actual experience will differ from these assumptions, either increasing or decreasing the ultimate cost. Of the assumptions, the investment return generally has the biggest impact. The following table provides a simple analysis on how the short-term costs are affected by the investment return assumption. Note that the long-term cost of the Plan will be largely driven by actual investment returns and other experience; the assumptions used in the valuation impact the timing of the contributions over the long term.

	Investment Return Assumption		
	Current 7.00%	+0.5% 7.50%	-0.5% 6.50%
Employer Contribution Rate	22.59%	17.92%	27.50%
Change		-4.67%	4.91%
Funded Ratio	77.2%	82.1%	72.4%
Change		4.9%	-4.8%

Summary Valuation Results

Exhibit 1 on the following page presents a summary of key valuation elements as of June 30, 2019 and June 30, 2018, and shows the relative change over the past year. More detail on each of these elements can be found in the following sections and exhibits of this report.

Exhibit 1
Summary of Significant Valuation Results

	June 30, 2019	June 30, 2018	Percentage Change
Total Membership			
A. Active Members	99,186	98,474	0.7%
B. Retired Members & Beneficiaries	66,507	64,880	2.5%
C. Vested Former Members[1]	15,567	14,906	4.4%
D. Total	181,260	178,260	1.7%
Pay Rate as of June 30, 2019			
A. Annual Total ($millions)	$ 8,423	$ 8,079	4.3%
B. Monthly Average per Active Member	7,076	6,837	3.5%
Average Monthly Benefit Paid to Current Retirees and Beneficiaries			
A. Service Retirement	4,334	4,200	3.2%
B. Disability Retirement	5,856	5,579	5.0%
C. Surviving Spouse and Dependents	3,052	2,934	4.0%
D. Total	4,385	4,233	3.6%
Actuarial Accrued Liability ($millions)			
A. Active Members	32,400	29,335	10.4%
B. Retired Members	41,021	38,087	7.7%
C. Vested Former Members	1,214	1,105	9.9%
D. Total	74,635	68,527	8.9%
Assets			
A. Market Value of Fund ($millions)	58,295	56,300	3.5%
B. Actuarial Value ($millions)			
1. Valuation Reserves	57,617	55,233	4.3%
2. Non-valuation Reserves	583	563	3.5%
C. Annual Investment Return			
1. Market Basis (Net Return)	5.5%	9.0%	n/a
2. Valuation (Actuarial) Basis	6.5%	8.1%	n/a
Unfunded Actuarial Accrued Liability ($ millions)	$ 17,018	$ 13,294	28.0%
Employer contribution rate for all plans combined as a percent of total payroll			
A. Gross Normal Cost	18.54%	16.80%	10.4%
B. Member Contributions[2]	(7.68)%	(6.88)%	11.6%
C. Employer Normal Cost	10.86%	9.92%	9.5%
D. UAAL Amortization	13.92%	10.99%	26.7%
E. Calculated Contribution Rate	24.78%	20.91%	18.5%
F. Deferred Recognition of new assumptions	(2.19)%	-	n/a
G. Employer Contribution Rate with phase-in	22.59%	20.91%	8.0%
Funded Ratio	77.2%	80.6%	(4.2)%
Results Based on Market Value (Informational Purposes Only)			
Calculated Contribution Rate	22.51%	20.55%	9.5%
Funded Ratio (excluding non-valuation reserves)	77.3%	81.3%	(4.9)%

1. Includes non-vested former members with contributions on deposit.
2. Includes non-contributory members. The average rate for contributory plans increased from 8.32 % to 9.13%.

2. Scope of the Report

This report presents the actuarial valuation of the Los Angeles County Employees Retirement Association as of June 30, 2019. This valuation was requested by the Board of Investments. Section 31453 of the County Employees Retirement Law of 1937 (the '37 Act) requires an actuarial valuation to be performed at least every three years for the purpose of setting contribution rates. The 2019 valuation meets this requirement. Under LACERA's Funding Policy, annual valuations determine the employer contribution rates each year. Member contribution rates for all plans except General Plan G and Safety Plan C are set in years in which relevant actuarial assumptions are altered, such as 2019. For members of General Plan G and Safety Plan C, member contribution rates are recalculated each year, based on one-half of the Plan's normal cost rate.

A summary of the findings resulting from this valuation is presented in the previous section. Section 3 describes the assets and investment experience of the Plan. The assets and investment income are presented in Exhibits 2-4. Exhibit 5 develops the actuarial value of assets as of June 30, 2019. Exhibit 6 develops the Valuation Assets used for funding benefits.

Section 4 describes the benefit obligations of LACERA. Exhibit 7 is the Actuarial Balance Sheet and Exhibit 8a analyzes the change in UAAL. Exhibit 8b shows a history of these changes.

Section 5 discusses the member contribution rates.

Section 6 discusses the employer contributions rates.

Section 7 discloses supplemental information for use in the Comprehensive Annual Financial Report (CAFR). Milliman provides LACERA financial reporting information relevant to GASB Statements No. 67 and 68 in separate reports.

Section 8 shows the estimated cash flow of the Plan, including a projection of both contributions and benefit payments.

This report includes several appendices:

Appendix A	A summary of the actuarial procedures and assumptions used to estimate liabilities and contributions.
Appendix B	A summary of the current benefit structure, as determined by the provisions of governing law on June 30, 2019.
Appendix C	Schedules of valuation data classified by various categories of plan members.
Appendix D	Member contribution rates by plan.
Appendix E	Historical information.
Appendix F	A glossary of actuarial terms used in this report.

3. Assets

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is June 30, 2019. On that date, the assets available for the payment of retirement benefits are appraised. These assets are compared with the actuarial liabilities (both accrued and future) for current members, which are generally in excess of the actuarial assets. The purpose of the valuation is to determine what future contributions by the members and employers are needed to pay all expected future benefits.

This section of the report looks at the assets used for funding purposes. In the next section, the actuarial liabilities will be discussed. Section 6 reviews the process for determining required contributions based on the relationship between the valuation assets and the actuarial liabilities.

A historical summary of the Plan's assets is presented below (dollar amounts in billions).

		Actuarial Value		
	Market Value of Total Assets	Non-Valuation Reserves	Valuation Assets	Total Fund Return (%)[(1)]
2010	$ 33.4	$ 0.8	$ 38.8	11.6
2011	39.5	0.9	39.2	20.2
2012	38.3	0.9	39.0	0.0
2013	41.8	0.4	39.9	11.9
2014	47.7	0.5	43.7	16.5
2015	48.8	0.5	47.3	4.1
2016	47.8	0.5	49.4	0.8
2017	52.7	0.5	52.2	12.7
2018	56.3	0.6	55.2	9.0
2019	58.3	0.6	57.6	5.5

1. As reported in the Investment Section of LACERA's CAFR for the fiscal year ended June 30, 2019. All returns are shown net of investment expenses.

On June 30, 2019, the total market value of the fund, less current liabilities, was $58.3 billion. The actuarial value of the fund was determined to be $58.2 billion, including the non-valuation reserves. The average total fund return for the last 10 years is 9.0% net of fees, as reported by LACERA.

Financial Exhibits

Exhibit 2 presents a Statement of Fiduciary Net Position and Exhibit 3 presents a Statement of Changes in Fiduciary Net Position. Exhibit 4 describes the allocation of LACERA's assets by the various reserve values determined for accounting purposes as disclosed in the audited financial statements.

Exhibits 2-4 are taken directly from data furnished to us by LACERA in its annual financial report. We have accepted these tables for use in this report without audit, but we have reviewed them both for the prior year and the current year for reasonableness and consistency with previous reports.

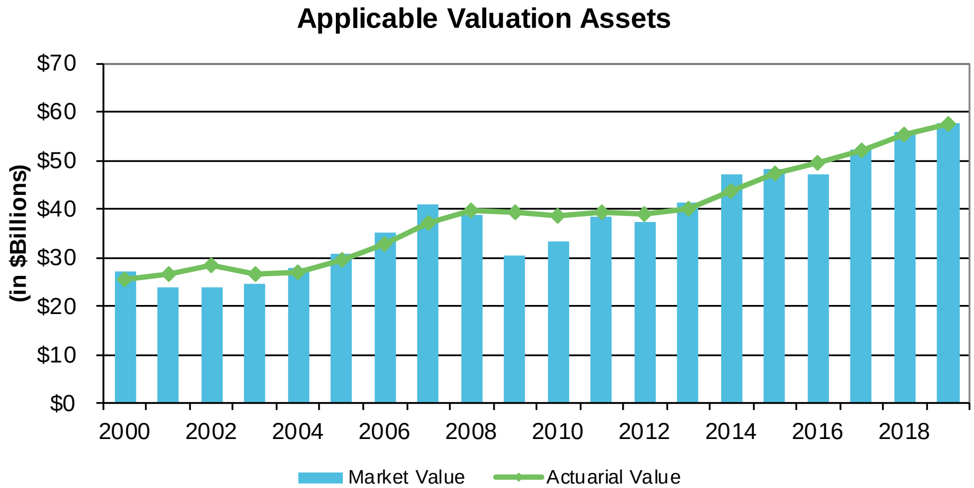
Actuarial Asset Method

The actuarial asset method computes the expected market value of assets based on the prior year's market value of assets, the actual cash flow of contributions and benefit payments, and the assumed investment rate of return.

For the previous year, the assumed rate of return was 7.25%, net of all expenses. The difference between the actual market value and the expected market value is recognized evenly (also referred to as "smoothing") over a five-year period.

Actuarial Value of Assets

The development of the June 30, 2019 actuarial value of assets is shown in Exhibit 5. Note the smoothing process is deferring past investment gains and losses, and is currently in a net actuarial gain position. The result is an actuarial value of assets that is less than the June 30, 2019 market value by $95 million. The following graph shows a historical comparison of the actuarial and market assets used for valuation purposes.



Funding Policy

Under the Board of Investments' long-term Funding Policy, the following is the allocation of actuarial assets. A Funded Ratio equal to 100% is the Funding Goal. Note that although the allocation of assets used in the actuarial valuation is similar to the process LACERA uses for accounting purposes, there are some differences, including the earnings considered for interest crediting purposes.

For funding purposes and for setting contributions rates, recognized earnings for a plan year is the recognized investment income as determined by the Actuarial Asset Method and includes both unrealized income and net realized income, together with the prior balance in the Contingency Reserve. The allocation of recognized earnings is performed once a year as of the Valuation Date in the following order of priority:

Priority 1: Allocate to the Member Reserve so the Actuarial Asset allocation to that Reserve equals the accounting value for that Reserve on the Valuation Date.

Priority 2: Allocate to the Advanced Employer Contributions Reserve so the Actuarial Asset allocation to that Reserve equals the accounting value for that Reserve on the Valuation Date.

Priority 3: Allocate to the Employer Reserve so the Actuarial Asset allocation to that reserve equals the accounting value for that Reserve on the Valuation Date.

Priority 4: Allocate to the County Contribution Credit Reserve so the Actuarial Asset allocation to that reserve equals the accounting value for that Reserve on the Valuation Date. Note: This Reserve is not a Valuation Reserve.

Priority 5: Allocate to the Employer Reserve so the total amounts allocated equal one-year's interest at the assumed interest rate used in the actuarial valuation as of the preceding Valuation Date to the extent there are positive recognized earnings to allocate.

Priority 6: Allocate to the Contingency Reserve an amount equal to 1% of the Market Value of Assets as of the Valuation Date to the extent there are positive recognized earnings to allocate.

Priority 7: Allocate to the Employer Reserve an amount, if necessary, when combined with other Valuation Reserves, to provide 100% funding of the AAL as of the Valuation Date to reach the Funding Goal. In the event there are negative recognized earnings, allocate the entire amount.

Priority 8: The Board may consider additional actions as permitted under the County Employee Retirement Law (CERL) using funds in excess of the amount needed to meet the Funding Goal for funding discretionary benefits. "Excess Earnings" as defined in the County Employees Retirement Law (CERL) may be appropriated upon reaching the Funding Goal; however, the Board may consider adjustment to the employer's contributions only upon satisfying California Government Code Section 7522.52(b).

Valuation Assets

Valuation Assets are the actuarial value of the fund, less the value of any Non-Valuation Reserves. Non-Valuation Reserves include Contingency Reserves and other reserves that have been set aside for current liabilities and special benefits to be funded outside of the actuarially determined contribution rates. The Contingency Reserve is set at a minimum of 1.0% of the market value of the total assets.

The Funding Policy allows the STAR Reserve to be allocated to the Valuation Assets (subject to periodic review), if needed. The June 30, 2019 STAR Reserve accounting value of $614 million was included in Valuation Assets and used to determine the employer contribution rates for the fiscal year beginning July 1, 2020. Although the STAR Reserve is included in the 2019 Valuation Assets, there is no liability included in this valuation for STAR benefits that may be granted in the future.

The Non-Valuation Reserves shown in Exhibit 6 for funding purposes are not the same as those shown in the audited financial statements and in Exhibit 4.

Exhibit 2
Statement of Fiduciary Net Position
As of June 30, 2019 and June 30, 2018

	2019	2018
Assets		
Cash and Short-Term Investments	$ 1,310,026,598	$ 1,786,940,488
Cash Collateral on Loaned Securities	814,829,353	1,191,235,028
Receivables		
Contributions Receivable	96,481,733	89,180,657
Accounts Receivable - Sale of Investments	1,046,945,184	707,664,801
Accrued Interest and Dividends	102,714,643	102,733,511
Accounts Receivable - Other	8,334,664	47,090,340
Total Receivables	1,254,476,224	946,669,308
Investments at Fair Value		
Equity	25,836,066,007	25,661,002,621
Fixed Income	18,028,747,241	15,934,586,918
Private Equity	6,028,264,809	5,929,098,297
Real Estate	6,192,619,038	6,326,245,674
Hedge Funds	1,890,739,586	1,592,125,696
Total Investments	57,976,436,681	55,443,059,206
Total assets	**61,355,768,857**	**59,367,904,030**
Liabilities		
Accounts Payable - Purchase of Investments	2,162,819,244	1,803,896,893
Retiree Payroll and Other Payables	921,886	912,029
Accrued Expenses	44,518,045	35,830,507
Tax Withholding Payable	35,504,456	32,848,312
Obligations under Securities Lending Program	814,829,353	1,191,235,028
Accounts Payable - Other	2,339,307	3,199,091
Total liabilities	3,060,932,291	3,067,921,859
Fiduciary Net Position restricted for pension benefits	**$ 58,294,836,565**	**$ 56,299,982,171**

Exhibit 3
Statement of Changes in Fiduciary Net Position
For the Fiscal Years Ended June 30, 2019 and 2018

	2019	2018
Additions		
Contributions		
Employer	$ 1,708,121,851	$ 1,564,284,149
Member	595,444,371	551,800,960
Total Contributions	2,303,566,222	2,116,085,109
Investment Income		
From Investing Activities:		
Net Appreciation/(Depreciation) in Fair Value of Investments	1,215,624,890	974,529,583
Investment Income/(Loss)	2,188,735,905	3,925,181,008
Total Investing Activity Income	3,404,360,796	4,899,710,590
Less Expenses From Investing Activities	(233,125,624)	(188,753,319)
Net Investing Activity Income	3,171,235,172	4,710,957,272
From Securities Lending Activities:		
Securities Lending Income	26,146,035	18,795,978
Less Expenses From Securities Lending Activities:		
Borrower Rebates	(20,545,040)	(11,786,852)
Management Fees	(1,112,831)	(1,326,534)
Total Expenses from Securities Lending Activities	(21,657,871)	(13,113,386)
Net Securities Lending Income	4,488,164	5,682,591
Total Net Investment Income	3,175,723,336	4,716,639,863
Miscellaneous	5,958,105	5,613,034
Total Additions	5,485,247,662	6,838,338,006
Deductions		
Retiree Payroll	3,375,752,179	3,177,726,363
Administrative Expenses	70,800,052	67,490,603
Investment Expenses	12,105,588	10,690,610
Refunds	28,691,156	23,220,662
Lump Sum Death Benefits	2,711,348	2,428,048
Miscellaneous	332,945	450,521
Total Deductions	3,490,393,268	3,282,006,806
Net increase/(decrease)	1,994,854,395	3,556,331,199
Fiduciary Net Position restricted for pension benefits		
Beginning of Year	56,299,982,171	52,743,650,971
End of Year	**$ 58,294,836,565**	**$ 56,299,982,171**

Exhibit 4
Allocation of Assets by Accounting Reserve Amounts

(Dollars in Thousands)

	June 30, 2019	June 30, 2018
1. Member Reserves		
a. Active Members	$ 22,363,377	$ 21,438,279
b. Unclaimed Deposits	-	-
c. Total Member Reserves	22,363,377	21,438,279
2. Employer Reserves		
a. Actual Employer Contributions	22,464,894	22,610,763
b. Advanced Employer Contributions	-	-
c. Total Employer Contributions	22,464,894	22,610,763
3. County Contribution Credit Reserve	-	-
4. STAR Reserve	614,011	614,011
5. Contingency Reserve	-	-
6. Total Reserves at Book Value	45,442,282	44,663,053
7. Unrealized Investment Portfolio Appreciation	12,852,555	11,636,929
8. **Total Reserves at Fair Value**	**$ 58,294,837**	**$ 56,299,982**

Note: These amounts were determined by LACERA for accounting purposes and are reported in the CAFR for the fiscal year ended June 30, 2019.

Exhibit 5
Five-Year Smoothing of Gains and Losses on Market Value

(Dollars in Thousands)

June 30, 2019 Valuation												
Plan Year Ending	Contributions	Benefit Payments	Expected Market Value	Actual Market Value	Phase-Out of Gain / (Loss)							
06/30/2019	$ 2,303,566	$ 3,407,155	$ 59,238,837	$ 58,294,837	80.00%	x	$	(944,000)	=	$	(755,200)
06/30/2018	2,116,085	3,203,375	55,441,551	56,299,982	60.00%	x		858,431	=		515,059
06/30/2017	1,857,938	3,029,633	50,102,154	52,743,651	40.00%	x		2,641,497	=		1,056,599
06/30/2016	1,901,795	2,889,186	51,455,977	47,846,694	20.00%	x		(3,609,283)	=		(721,857)
06/30/2015	1,936,233	2,768,410	50,438,628	48,818,350	0.00%	x		(1,620,278)	=		0
								(a) Total Phase-Out of Gain / (Loss)	=	$	94,601
								(b) Total Market Value of Assets	=	$	58,294,837
								(c) Total Actuarial Value of Assets [(b) - (a)]	=	**$**	**58,200,236**

Total Actuarial Value of Assets = Total Market Value of Assets less the Total Phase-Out amount
Phase-Out amounts will be recognized in future years.

Projected Recognition of Actuarial Asset Gains / (Losses) in Future Valuations

	2020 Val	2021 Val	2022 Val	2023 Val	Total
Amount to be Recognized	$ (210,671)	$ 511,186	$ (17,114)	$ (188,800)	$ 94,601

Exhibit 6
Allocation of Valuation and Non-Valuation Assets

(Dollars in Thousands)

	June 30, 2019	June 30, 2018
1. Total Market Value of Assets	$ 61,355,769	$ 59,367,904
2. Current Liabilities	3,060,932	3,067,922
3. Net Assets Held in Trust for Pension Benefits	58,294,837	56,299,982
4. Market Stabilization Reserve[1]	94,601	503,874
5. Actuarial Value of Fund Assets	58,200,236	55,796,108
6. Non-Valuation Reserves[2]		
a. Unclaimed Deposits	-	-
b. Contingency Reserve	582,948	563,000
c. Advanced Employer Contributions	-	-
d. County Contribution Credit Reserve	-	-
e. Reserve for STAR Program	-	-
f. Total	582,948	563,000
7. Valuation Assets[2]		
a. Member Reserves	22,363,377	21,438,279
b. Employer Reserves for Funding Purposes	35,253,911	33,794,829
c. Total	57,617,288	55,233,108

1. The Market Stabilization Reserve represents the difference between the Market Value of the fund less Current Liabilities, and the Actuarial Value of the fund as determined in Exhibit 5.

2. The values used for funding purposes for all reserves are based on the Board's Funding Policy. Amounts used for funding purposes may differ from those reported in the audited financial statements as shown in Exhibit 4.

4. Actuarial Liabilities

In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of LACERA's assets as of the valuation date, June 30, 2019. In this section, the discussion will focus on the commitments of LACERA for retirement benefits, which are referred to as its actuarial liabilities.

Actuarial Balance Sheet – Liabilities

Actuarial liabilities attributable to both past and future benefits are included on the actuarial balance sheet. The difference between the Valuation Assets and the total actuarial liabilities is the amount that needs to be funded by future member and employer contributions. Both the current and future assets (contributions) are included on the actuarial balance sheet and compared to the total actuarial liabilities. The determination of the level of future member and employer contributions needed is discussed in the next section.

Exhibit 7 contains an analysis of the actuarial present value of all future benefits for inactive members (both retired and vested former members) and active members. The analysis is given by class of membership, by plan and by type of benefit. Note that for purposes of this exhibit the Valuation Assets are shown allocated by plan in proportion to each plan's reserves (employer and member).

The actuarial liabilities include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes measures of both benefits already earned and future benefits to be earned. For all members, active and inactive, the value extends over the rest of their lives and for the lives of any surviving beneficiaries.

The actuarial assumptions used to determine the liabilities are based on the results of the 2019 Investigation of Experience Report. New assumptions were adopted by the Board effective with the June 30, 2019 actuarial valuation. See Appendix A of this report for details.

All liabilities reflect the benefits effective through June 30, 2019. This includes permanent STAR COLAs that have been adopted through the valuation date, but does not include the value of any STAR benefits that may be granted in the future.

Exhibit 7
Actuarial Balance Sheet – June 30, 2019

(Dollars in Millions)

	General						Safety			
	Plan A	Plan B	Plan C	Plan D	Plan E	Plan G	Plan A	Plan B	Plan C	All Plans
LIABILITIES										
Present Value of Benefits - Inactives										
- Retirees and Beneficiaries	$ 11,576	$ 470	$ 274	$ 8,594	$ 4,080	$ 5	$ 7,304	$ 8,709	$ 9	$ 41,021
- Vested Former	9	2	1	596	450	29	0	125	2	1,214
- Inactive Total	11,585	472	275	9,190	4,530	34	7,304	8,834	11	42,235
Present Value of Benefits - Actives										
- Service Retirement	107	39	42	20,969	6,268	4,820	9	8,763	995	42,012
- Transfer Service (prior LACERA plan)	0	0	0	235	451	4	0	13	0	703
- Disability Retirement	1	0	0	914	N/A	361	1	3,262	543	5,082
- Death	1	0	0	373	N/A	112	0	77	18	581
- Termination	0	0	0	198	84	289	0	46	53	670
- Active Total	109	39	42	22,689	6,803	5,586	10	12,161	1,609	49,048
Total Actuarial Liabilities	**$ 11,694**	**$ 511**	**$ 317**	**$ 31,879**	**$ 11,333**	**$ 5,620**	**$ 7,314**	**$ 20,995**	**$ 1,620**	**$ 91,283**
ASSETS										
Valuation Assets	(2,553)	402	297	28,184	13,172	1,744	(1,396)	17,433	334	57,617
PV Future Member Contributions	1	1	1	2,974	N/A	2,434	0	1,109	731	7,251
PV Future Employer Normal Cost Contributions	4	1	0	3,405	1,171	2,202	0	1,938	676	9,397
UAAL or (Surplus Funding)	14,242	107	19	(2,684)	(3,010)	(760)	8,710	515	(121)	17,018
Total Current and Future Assets	**$ 11,694**	**$ 511**	**$ 317**	**$ 31,879**	**$ 11,333**	**$ 5,620**	**$ 7,314**	**$ 20,995**	**$ 1,620**	**$ 91,283**

Actuarial Balance Sheet – Assets

For the purpose of the Actuarial Balance Sheet, LACERA's assets are equal to the sum of:

(a) Assets currently available to pay benefits and considered for funding purposes (the Valuation Assets);

(b) The present value of future contributions expected to be made by current active members; and

(c) The present value of future contributions expected to be made by the employer.

Actuarial Cost Method

The Actuarial Balance sheet determines the amount of future contributions that are needed, but the method used to determine when those future contributions will be made in future years is called the "actuarial cost method." For this valuation, the entry age actuarial cost method has been used. Under this method, the contributions required to meet the difference between current assets and current actuarial liabilities are allocated each year between two elements:

- A normal cost amount; and
- An amount to amortize the UAAL (Unfunded Actuarial Accrued Liability). Note that the UAAL may be negative (representing current assets greater than current actuarial liabilities).

The two items described above – the Normal Cost and UAAL – are the keys to understanding the actuarial cost method.

Normal Cost

The Normal Cost is the theoretical contribution rate that will meet the ongoing costs of a group of average new employees. Suppose that a group of new employees was covered under a separate fund from which all benefits and to which all contributions and associated investment returns were paid. Under the entry age actuarial cost method, the Normal Cost contribution rate maintains the funding of benefits as a level percentage of pay. If experience follows the actuarial assumptions precisely, the fund would be completely liquidated when the last payment to the last survivor of the group is made.

By applying the Normal Cost contribution rate to the present value of salaries expected to be paid in the future, we determine the present value of future Normal Cost contributions. Future contributions are expected to be made by both the members and the employer. The member contribution rates are determined based upon requirements established in the '37 Act and the actuarial assumptions. Based on these member contribution rates, we determine the present value of future member contributions. We subtract that value from the total future Normal Cost contributions expected, based on the entry age cost method. The remaining difference is the employer's portion of the future Normal Cost contributions.

Actuarial Accrued Liability

The difference between the present value of all future obligations and the present value of the future Normal Cost contributions is referred to as the Actuarial Accrued Liability (AAL). The AAL is calculated and then compared to the value of assets available to fund benefits. The difference is referred to as the UAAL. The results for all LACERA plans in aggregate are summarized below:

(Dollars in millions)	2019	2018	Percent Change
A. Actuarial present value of all future benefits for contributing members, former contributing members, and their survivors	$ 91,283	$ 82,534	10.6%
B. Actuarial present value of total future normal costs for current members	16,648	14,007	18.9%
C. Actuarial accrued liability [A-B]	74,635	68,527	8.9%
D. Valuation Assets	57,617	55,233	4.3%
E. UAAL or (Surplus Funding) [C-D]	17,018	13,294	28.0%
F. Funded Ratio [D/C]	77.2%	80.6%	-4.2%

Unfunded Actuarial Accrued Liability

The portion allocated to service already rendered or accrued is called the AAL. The difference between the AAL and the Valuation Assets is called the Unfunded AAL (UAAL). If a UAAL amount exists, it usually results from prior years' benefit or assumption changes and the net effect of accumulated gains and losses. If the employer had always contributed the current Normal Cost, and if there were no prior benefit or assumption changes, and if actual experience exactly matched the actuarial assumptions, then the present value of all future Normal Cost contributions would be sufficient to fund all benefits and there would be no UAAL.

Exhibit 7 shows how the UAAL was derived for each level of plan benefits. In the Actuarial Balance sheet, the total actuarial liability for all future benefits must be equal to the current and future assets.

The Actuarial Balance Sheet for each plan, as well as its UAAL, is based on an estimated allocation of the total LACERA Valuation Assets, as previously shown in Exhibit 7. The allocation is based on the relative value of each plan's employer and member reserves as reported to us by LACERA. These allocations are shown for illustrative purposes only, as the UAAL contribution rates are paid by the employer based on the valuation results in aggregate.

Funding Adequacy

A key consideration in determining the adequacy of the funding of LACERA is how the UAAL is being funded. Under LACERA's Funding Policy, a new UAAL "layer" is established each year when the Funded Ratio is less than 100% or greater than or equal to 120%. Effective with the June 30, 2019 valuation, all new UAAL layers are amortized over 20-year periods, compared to 30-year periods previously.

If future experience is significantly more favorable than expected based on the actuarial assumptions, then LACERA's UAAL may be eliminated . Conversely, if experience is less favorable, a larger UAAL will develop.

Analysis of Change in Unfunded Actuarial Accrued Liability

The UAAL, at any date after establishment of a retirement plan, is affected by any actuarial gains (decreases in UAAL) or losses (increases in UAAL) arising when the actual experience of the retirement plan varies from the experience anticipated by the actuarial assumptions. To the extent actual experience, as it develops, differs from that expected according to the assumptions used, so also will the emerging costs differ from the estimated costs.

The 2019 actuarial valuation reflects an increase in the UAAL of $2,528 due to the new assumptions. In addition, there was an actuarial experience loss of $1,171 million for the fiscal year just ended. This resulted in an approximate $3.7 billion increase in the UAAL. The effect of the gains and losses on the UAAL is shown in Exhibit 8a. A summary of these factors is:

- Investment Returns: Returns on market assets were 5.5% (net of investment expenses) compared to the assumed return of 7.25%. This, combined with recognitions of gains and losses from prior periods, resulted in an actuarial asset loss of $477 million.
- Active Member Experience (non salary): This includes gains and losses from termination, service retirement, disability retirement, and death different than assumed. This resulted in an actuarial loss of $124 million.
- Salary Increases: Individual salaries for continuing active members increased at a rate greater than the valuation assumption. This resulted in an actuarial loss of $486 million.
- Actual CPI versus Assumption: The actual CPI increase was greater than assumed for members of Plan A. This resulted in COLA increases more than the assumption, which generated an actuarial loss of $44 million.
- Mortality Experience: An actuarial loss due to mortality generally indicates that retired members are living longer than the current assumption predicts. This year, there was an actuarial gain of $6 million due to mortality, indicating retirees are currently living slightly shorter lives than assumed.
- Other Experience: Examples of this are gains and losses from retirement and mortality experience of inactive members, reciprocity, and transfers between plans. These factors combined resulted in an actuarial loss of $46 million.

Change in Unfunded Actuarial Accrued Liability – History

Exhibit 8b shows the sources of change in the UAAL over the past five valuations. The single biggest source of annual change in most years, when there are no changes in the assumptions, is the return on investments being either greater than or less than the assumption.

Exhibit 8a
Analysis of Change in Unfunded Actuarial Accrued Liability

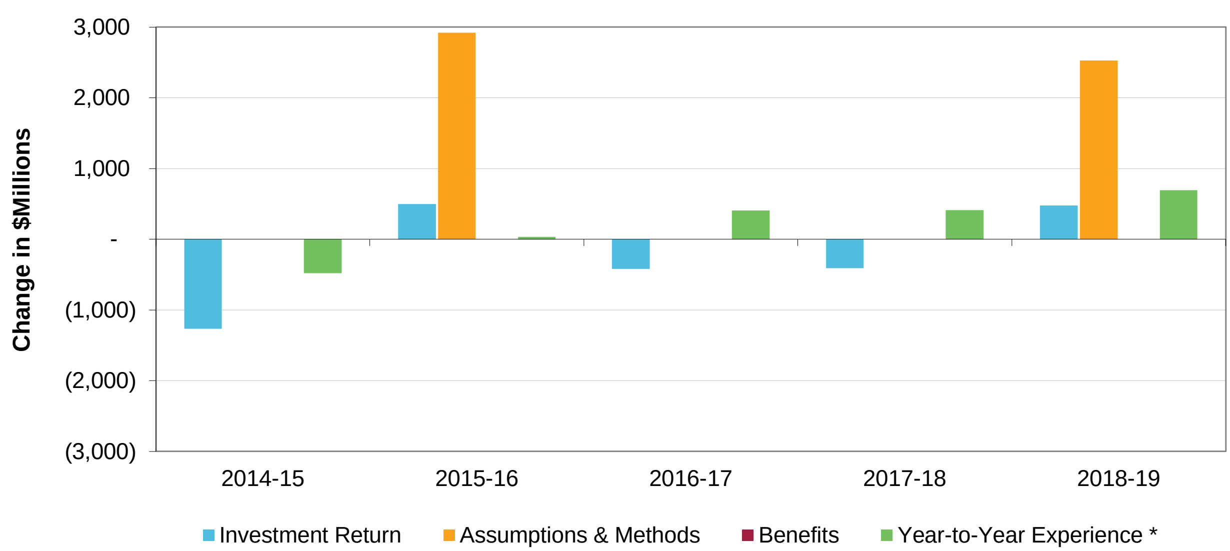
(Dollars in Millions)

		Amount	As a Percent of June 30, 2019 Actuarial Accrued Liability
Unfunded Actuarial Accrued Liability - June 30, 2018		**$ 13,294**	**17.81%**
Interest Accrued		976	1.31%
Benefits Accrued (Normal Cost)		1,352	1.81%
Contributions			
Employer - Cash	$ (1,708)		-2.29%
Employer - Contribution Credit	-		0.00%
Member	(595)		-0.80%
Total		(2,303)	-3.09%
Expected Unfunded Actuarial Accrued Liability - June 30, 2019		**$ 13,319**	**17.85%**
Sources of Change:			
Increase in UAAL due to New Assumptions		2,528	3.39%
Asset (Gains) and Losses			
(Gain) / Loss due to Investment Income		477	0.64%
Liability (Gains) and Losses			
Active Member Experience (non salary)	$ 124		0.17%
Salary Increases Greater than Expected	486		0.65%
CPI Greater than Expected	44		0.06%
Mortality Experience	(6)		-0.01%
All Other Experience	46		0.06%
Total		694	0.93%
Total Changes		**$ 3,699**	4.96%
Unfunded Actuarial Accrued Liability - June 30, 2019		**$ 17,018**	**22.80%**

Exhibit 8b
History of Changes in Unfunded Actuarial Accrued Liability

(Dollars in Millions)

	2014-15	2015-16	2016-17	2017-18	2018-19	2014-19
Prior Valuation UAAL	**$ 11,288**	**$ 9,491**	**$ 12,841**	**$ 13,145**	**$ 13,294**	**$ 11,288**
Increase in UAAL due to:						
Expected Increase / (Decrease)	(54)	(102)	320	146	25	335
Asset (Gains) and Losses	(1,263)	496	(421)	(411)	477	(1,122)
Changes in Benefits	-	-	-	-	-	-
Changes in Assumptions	-	2,922	-	-	2,528	5,450
Changes in Methods	-	-	-	-	-	-
Salary Increases	79	162	277	223	486	1,227
CPI Increases	(570)	(191)	(139)	45	44	(811)
Mortality Experience	(59)	(4)	(51)	(20)	(6)	(140)
All Other Experience	70	67	318	166	170	791
Total Increase / (Decrease)	**(1,797)**	**3,350**	**304**	**149**	**3,724**	**5,730**
Valuation UAAL	**$ 9,491**	**$ 12,841**	**$ 13,145**	**$ 13,294**	**$ 17,018**	**$ 17,018**
Funded Ratio	**83.3%**	**79.4%**	**79.9%**	**80.6%**	**77.2%**	**77.2%**



** Year-to-Year Experience includes changes due to Salary, CPI, Mortality and Other Experience.*

5. Member Contributions

Normal Contributions for non-PEPRA Plans

Member contributions are of two types: Normal contributions and cost-of-living contributions.

Normal contributions for each non-PEPRA plan (all plans except General Plan G and Safety Plan C) are defined in the following sections of the County Employees' Retirement Law:

Plan	'37 Act Reference	Formula
General A	31621.3	1/240th of FAC at age 55
General B	31621.1	1/120th of FAC at age 55
General C	31621	1/120th of FAC at age 60
General D	31621	1/120th of FAC at age 60
General E	N/A	Plan E is non-contributory
Safety A	31639.5	1/200th of FAC at age 50
Safety B	31639.25	1/100th of FAC at age 50

Note: FAC = Final Average Compensation

Normal member contributions are determined using the Entry Age Normal Funding Method and the following actuarial assumptions:

1. Expected rate of return on assets.

2. Individual salary increase rate (wage growth + merit).

3. Mortality for members on service retirement.

Since new assumptions were adopted for the 2019 valuation, we are recommending changes to the member contribution rates for General Plans A to D and Safety Plans A and B, as shown in Appendix D. A sample of these recommended member contribution rates is shown in Exhibit 9.

Member contribution rates for General Plan G and Safety Plan C are discussed below.

Cost-of-Living Contributions for non-PEPRA Plans

The determination of the member cost-of-living (COLA) contributions is based on Section 31873 of the County Employees' Retirement Law. This section requires that the cost of the COLA benefit be shared equally between members and the employer. Unlike the member normal contributions, these rates are based on the actuarial cost of the benefits and reflect all assumptions used in the valuation of liabilities.

Since new assumptions were adopted for the 2019 valuation we are recommending changes in the member cost-of-living contribution rates. The recommended cost-of-living contribution rates, expressed as a percentage of the normal member contribution rates, are as follows:

Plan	Recommended COLA %	Current COLA %	Ratio (Recommended / Current)
General A	84.46%	79.37%	106.4%
General B	25.90%	23.97%	108.1%
General C	26.81%	25.46%	105.3%
General D	25.94%	24.49%	105.9%
General E	0.00%	0.00%	N/A
Safety A	87.15%	86.98%	100.2%
Safety B	33.03%	31.63%	104.4%

The relative magnitude of these amounts reflects the differences in the normal contribution rates for each plan and the different cost-of-living benefits offered by the different plans. The rate for Plan E is 0.00%, since it is non-contributory.

A sample of the current member contribution rates (normal plus cost-of-living) can be found in Exhibit 9.

Full disclosure of the member rates, showing both the normal and the total (normal plus cost-of-living) contribution rates, can be found in Appendix D.

Member Contribution Rates for General Plan G and Safety Plan C (PEPRA Plans)

Members of the two plans developed in compliance with the California Public Employees' Pension Reform Act of 2013 (PEPRA) contribute a flat rate (i.e., does not vary by entry age) based on whether they are in the General or Safety plan. This rate is set equal to one-half of the total Normal Cost rate. We are recommending changes to the member contribution rates for these plans, as shown below, to reflect the Plan's Normal Cost rates for the 2019 valuation.

	General Plan G	Safety Plan C
All Ages: Recommended	**9.11%**	**14.54%**
All Ages: Current	8.43%	13.69%
Ratio (Recommended / Current)	108.1%	106.2%

Note that the member contribution rates for these plans are further split for purposes of this report into a “Normal” and “Cost of Living” component. The cost-of-living component for these members, as shown in Exhibit 9 below, represents one-half of the cost of the COLA for these plans.

Average Member Rates

The average member contribution rate for only those members in contributory plans at June 30, 2019 is 9.13% of covered payroll. This number compares to 7.68% of covered payroll, which is the average member contribution rate among all members. The 7.68% offsets the gross normal cost to yield the employer normal cost rate. Note that covered payroll does not include pay for PEPRA plan members that is above the PEPRA compensation limit.

Exhibit 9
Sample Member Contribution Rates

	Entry Age	Recommended Rates (Based on 2019 Valuation) Normal	Cost of Living	Total as a % of Pay	Current Rate (Total)	Ratio (New / Current)
General Members						
Plan A	25	3.24%	2.74%	5.98%	5.33%	112.2%
	35	3.99%	3.37%	7.36%	6.65%	110.7%
	45	4.83%	4.08%	8.91%	8.18%	108.9%
	55	5.13%	4.33%	9.46%	8.84%	107.0%
Plan B	25	6.47%	1.68%	8.15%	7.35%	110.9%
	35	7.98%	2.07%	10.05%	9.19%	109.4%
	45	9.66%	2.50%	12.16%	11.32%	107.4%
	55	10.25%	2.65%	12.90%	12.24%	105.4%
Plan C	25	5.52%	1.48%	7.00%	6.32%	110.8%
	35	6.80%	1.82%	8.62%	7.89%	109.3%
	45	8.33%	2.23%	10.56%	9.86%	107.1%
	55	9.68%	2.60%	12.28%	11.66%	105.3%
Plan D	25	5.52%	1.43%	6.95%	6.27%	110.8%
	35	6.80%	1.76%	8.56%	7.83%	109.3%
	45	8.33%	2.16%	10.49%	9.78%	107.3%
	55	9.68%	2.51%	12.19%	11.57%	105.4%
Plan G	All Ages	7.36%	1.75%	9.11%	8.43%	108.1%
Safety Members						
Plan A	25	4.74%	4.13%	8.87%	7.82%	113.4%
	35	5.63%	4.91%	10.54%	9.63%	109.4%
	45	6.70%	5.84%	12.54%	11.50%	109.0%
	55	6.33%	5.52%	11.85%	11.61%	102.1%
Plan B	25	9.48%	3.13%	12.61%	11.00%	114.6%
	35	11.27%	3.72%	14.99%	13.57%	110.5%
	45	13.40%	4.43%	17.83%	16.20%	110.1%
	55	13.40%	4.43%	17.83%	16.35%	109.1%
Plan C	All Ages	11.27%	3.27%	14.54%	13.87%	104.8%

Note: A portion of some of the member contribution rates is paid for (“picked up”) by the employer and is not considered part of the member’s contribution account for refund purposes. Such contributions are referred to as the surcharge amount and are subject to change each year. The rates shown in the table above are prior to any surcharge payments.

6. Employer Contributions

Calculated Employer Contribution Rate

Contributions to LACERA are determined using the Entry Age Normal Cost Method. The portion of the actuarial present value of retirement benefits allocated to a valuation year by the Actuarial Cost Method is called the Normal Cost. These amounts are usually expressed as a percentage of payroll and called the Normal Cost Contribution Rate. Exhibit 10 illustrates the Normal Cost Contribution Rates by type of benefit and for each plan based on this valuation. A comparison with last year is also shown.

Under the Funding Policy, the total contribution rate is set equal to the Normal Cost contribution plus a payment by the employer towards the UAAL. The calculation of the UAAL contribution rate is shown in Exhibit 12. A portion of the Normal Cost contribution is funded by member contributions. The remainder is paid for by the employer.

The total calculated employer contribution rates for each plan, along with a comparison to the prior year's calculated rates, can be found in Exhibit 11. These results are expressed as a percentage of payroll and annual contribution dollars. Note that LACERA's UAAL contribution rate is not determined separately for each plan, but is funded evenly as a percentage of pay over salaries for all members.

For the fiscal year beginning in 2020, the total calculated employer contribution rate increases to 22.59% (after reflecting the phase in of the employer contribution rate). This is equal to the aggregate employer Normal Cost contribution rate of 10.86% based on the 2019 valuation, plus a layered amortization payment of the UAAL. The UAAL amortization layers are shown in Exhibit 12. Effective with the June 30, 2019 valuation, all new UAAL layers are amortized over a 20-year period, beginning with the date the contribution is first expected to be made.

(All values as a % of Payroll)

Employer Normal Cost Contribution Rate	10.86%
Layered Amortization of UAAL	13.92%
Calculated Employer Contribution Rate (before phase-in)	24.78%
Deferred Recognition of 2019 Assumption Changes	(2.19)%
Calculated Employer Contribution Rate (with phase-in)	22.59%

The 1.68% increase from last year in the calculated employer contribution rate is primarily due to the assumption and method changes adopted by the Board of Investments effective June 30, 2019. These changes resulted in an increase of 3.29% in the employer contribution rate, which will be phased-in over three fiscal years effective with the fiscal year beginning July 1, 2020. Recognition of investment losses resulted in an increase of 0.42% in the employer contribution rate, and other sources, including salary increases greater than assumed, increased the employer contribution rate by about 0.16%.

Employer Contribution Rate with phase-in

At the January 2020 meeting, the Board of Investments adopted a three-year phase-in of the impact of the change in employer contribution rate resulting from the new assumptions adopted effective June 30, 2019. For the fiscal year beginning July 1, 2022, the impact of the June 30, 2019 assumption changes will be fully phased in.

Section II 1A(4) of the Funding Policy states: "In no case shall the total amount contributed by the employer be less than the Normal Cost Rate for the year, plus a 30-year amortization of the total UAAL." Based on discussion with LACERA staff, it is our understanding that that since the employer contribution rate, including future phased-in increases, is projected to amortize the UAAL in less than 30 years, the employer contribution rate is deemed to meet the requirements under Section II 1A(4) of the Funding Policy.

Exhibit 10
Calculated Normal Cost Contribution Rates – June 30, 2019

	General							Safety				Grand
	Plan A	Plan B	Plan C	Plan D	Plan E	Plan G	Total	Plan A	Plan B	Plan C	Total	**Total**
A. Normal Cost Contribution Rate												
Service Retirement	21.48%	16.82%	13.89%	14.74%	10.13%	15.59%	14.06%	19.45%	18.23%	17.50%	18.10%	14.81%
Disability Retirement	1.15%	0.93%	0.76%	1.16%	0.00%	1.29%	0.97%	9.15%	9.07%	10.28%	9.28%	2.52%
Death	0.32%	0.28%	0.23%	0.38%	0.00%	0.35%	0.30%	0.41%	0.35%	0.32%	0.34%	0.31%
Termination	0.44%	0.42%	0.40%	0.98%	0.61%	0.99%	0.91%	0.74%	0.83%	0.98%	0.86%	0.90%
Total	**23.39%**	**18.45%**	**15.28%**	**17.26%**	**10.74%**	**18.22%**	**16.24%**	**29.75%**	**28.48%**	**29.08%**	**28.58%**	**18.54%**
B. Member Contributions	(6.05)%	(9.05)%	(7.29)%	(8.05)%	0.00%	(9.11)%	(6.74)%	(3.38)%	(11.21)%	(14.54)%	(11.78)%	(7.68)%
C. Net Employer Normal Cost as of June 30, 2019 (A) - (B)	17.34%	9.40%	7.99%	9.21%	10.74%	9.11%	9.50%	26.37%	17.27%	14.54%	16.80%	10.86%
D. Net Employer Normal Cost as of June 30, 2018	16.36%	8.34%	7.34%	8.43%	9.80%	8.43%	8.73%	24.33%	15.32%	13.69%	15.11%	9.92%
E. Increase (Decrease) as a Percentage of Payroll (C) - (D)	0.98%	1.06%	0.65%	0.78%	0.94%	0.68%	0.77%	2.04%	1.95%	0.85%	1.69%	0.94%
F. Estimated Payroll for fiscal year beginning July 1, 2020*	$ 11	$ 4	$ 4	$ 3,910	$ 1,393	$ 1,743	$ 7,065	$ 1	$ 1,349	$ 282	$ 1,631	$ 8,696
G. Estimated Total Normal Cost Contribution in Dollars (A x F)**	$ 3	$ 1	$ 1	$ 675	$ 150	$ 317	$ 1,147	$ -	$ 384	$ 82	$ 466	$ 1,613

** Estimated Payroll based upon annualized salary rate as of June 30, 2019 increased by 3.25% wage inflation. Dollar figures in millions.*
*** The timing of the Normal Cost shown in this exhibit is spread over the entire year and corresponds to payroll timing.*

Exhibit 11
Total Employer Contributions

	General							Safety				All
	Plan A	Plan B	Plan C	Plan D	Plan E	Plan G	Total	Plan A	Plan B	Plan C	Total	Plans
A. Net Employer Normal Cost												
1. Basic Benefits	13.82%	7.54%	6.45%	7.57%	8.88%	7.36%	7.79%	19.13%	13.70%	11.27%	13.85%	8.80%
2. Cost-of-Living Benefits	3.52%	1.86%	1.54%	1.64%	1.86%	1.75%	1.71%	7.24%	3.57%	3.27%	2.95%	2.06%
3. Total June 30, 2019	17.34%	9.40%	7.99%	9.21%	10.74%	9.11%	9.50%	26.37%	17.27%	14.54%	16.80%	10.86%
B. UAAL Contribution Rate	13.92%	13.92%	13.92%	13.92%	13.92%	13.92%	13.92%	13.92%	13.92%	13.92%	13.92%	13.92%
C. Calculated June 30, 2019 Contribution Rate (A) + (B)	**31.26%**	**23.32%**	**21.91%**	**23.13%**	**24.66%**	**23.03%**	**23.42%**	**40.29%**	**31.19%**	**28.46%**	**30.72%**	**24.78%**
D. Deferred Recognition of new assumptions	(2.19)%	(2.19)%	(2.19)%	(2.19)%	(2.19)%	(2.19)%	(2.19)%	(2.19)%	(2.19)%	(2.19)%	(2.19)%	(2.19)%
E. Total June 30, 2019 Contribution Rate with phase-in (C) + (D)	**29.07%**	**21.13%**	**19.72%**	**20.94%**	**22.47%**	**20.84%**	**21.23%**	**38.10%**	**29.00%**	**26.27%**	**28.53%**	**22.59%**
F. Total June 30, 2018 Contribution Rate with phase-in	27.35%	19.33%	18.33%	19.42%	20.79%	19.42%	19.72%	35.32%	26.31%	24.68%	26.10%	20.91%
G. Estimated Payroll for fiscal year beginning July 1, 2020*	$ 11	$ 4	$ 4	$ 3,910	$ 1,393	$ 1,743	$ 7,065	$ 1	$ 1,349	$ 282	$ 1,631	$ 8,696
H. Estimated Annual Contribution (E x G)	**$ 3**	**$ 1**	**$ 1**	**$ 819**	**$ 313**	**$ 363**	**$ 1,500**	**$ -**	**$ 391**	**$ 74**	**$ 465**	**$ 1,965**
I. Last Year's Estimated Annual Contribution	$ 4	$ 1	$ 1	$ 753	$ 302	$ 278	$ 1,338	$ -	$ 353	$ 53	$ 406	$ 1,744
J. Increase / (Decrease) in Annual Contribution	$ (1)	$ -	$ -	$ 66	$ 11	$ 85	$ 162	$ -	$ 38	$ 21	$ 59	$ 221

** Estimated Payroll based upon annualized salary rate as of June 30, 2019 increased by 3.25% wage inflation. Dollar figures in millions.*

Exhibit 12
Unfunded Actuarial Accrued Liability Detail

(Dollars in Millions)

Date Established	Description	Balance as of June 30, 2019	Interest on Balance	Amort. Payment on June 30, 2020 (1)	Balance as of June 30, 2020 (2)	Remaining Period as of June 30, 2020 (5)	July 1, 2020 Amortization Payment
June 30, 2009	Initial UAAL	$ 5,630.4	$ 394.1	$ 423.0	$ 5,601.5	19 Years	$ 406.6
June 30, 2010	(Gain) / Loss(3)	3,067.0	214.7	223.1	3,058.6	20 Years	214.3
June 30, 2011	(Gain) / Loss(3)	1,517.3	106.2	107.1	1,516.4	21 Years	102.8
June 30, 2012	(Gain) / Loss(3)	2,476.5	173.4	170.0	2,480.0	22 Years	162.9
June 30, 2013	(Gain) / Loss(3)	1,397.7	97.8	93.4	1,402.1	22 Years	92.1
June 30, 2014	(Gain) / Loss	(2,584.0)	(180.9)	(168.5)	(2,596.3)	22 Years	(170.6)
June 30, 2015	(Gain) / Loss	(2,015.7)	(141.1)	(128.4)	(2,028.4)	22 Years	(133.3)
June 30, 2016	(Gain) / Loss(3)	3,867.7	270.7	241.1	3,897.3	22 Years	256.1
June 30, 2017	(Gain) / Loss	(18.7)	(1.3)	1.1	(21.1)	22 Years	(1.4)
June 30, 2018	(Gain) / Loss	60.4	4.2	3.6	61.0	22 Years	4.0
June 30, 2019	(Gain) / Loss(3)	3,619.2	253.3	(77.1) (4)	3,949.7	20 Years	276.7
						Total Amortization Payment July 1, 2020:	$ 1,210.1
						Projected Payroll July 1, 2020:	$ 8,696.2
UAAL as of June 30, 2019:		**$ 17,018.0**		**UAAL Contribution Rate (as a % of Payroll) FYB July 1, 2020:**			**13.92%**

Explanatory Notes:

1. Amortization Payments are based on a fixed schedule that increases by the payroll assumption each year.
2. The assets and liabilities used in the calculation of the UAAL are as of June 30, 2019, whereas, the contribution rates are not effective until July 1, 2020. Therefore, the UAAL is adjusted to June 30, 2020 based on the actual contribution rate for the period.
3. (Gain) / Loss layers include impact of assumption changes in these years.
4. The amortization of UAAL does not begin until July 1, 2020; therefore, the UAAL amount is adjusted by one year to reflect the actual July 1, 2019 contribution rate.
5. Effective with the June 30, 2019 valuation, all new UAAL layers will be amortized over a 20-years period, beginning with the date the contribution is first expected to be made.

7. Supplemental Information

Governmental Accounting Standards Board (GASB) Statement No. 67 sets out requirements for defined benefit pension plan reporting and disclosures. GASB Statement No. 68 sets out requirements for accounting by state and local government employers.

Milliman provides LACERA with results relevant to Statements No. 67 and 68 in separate stand-alone financial reporting valuation reports.

For informational purposes, we have provided the following exhibits in this report that LACERA may use in the audited financial statements:

Exhibit 13: Schedule of Funding Progress
Exhibit 14: Schedule of Employer Contributions
Exhibit 15: Solvency Test
Exhibit 16: Actuarial Analysis of Financial Experience
Exhibit 17: Retirants and Beneficiaries added to / removed from Retiree Payroll

Exhibit 13, Schedule of Funding Progress, compares actuarial assets and liabilities of the Plan, based on the actuarial funding method used.

Exhibit 14, Schedule of Employer Contributions, compares the employer contributions required based on the actuarial valuation with the employer contributions actually made. Information shown in this exhibit comes from LACERA's audited financial statements.

Exhibit 15 compares the Actuarial Value of Valuation Assets to the types of Actuarial Accrued Liabilities, applying them first to Active Member contributions, then to retirees and beneficiaries, and then the remaining amount to the Active Members benefits. This is referred to as the Solvency Test.

Exhibit 16 shows the changes in actual versus expected UAAL from year to year.

Exhibit 17 reconciles the retired members and beneficiaries who have been added to and removed from the retiree payroll.

Exhibit 13
Schedule of Funding Progress

(Dollars in Thousands)

Actuarial Valuation Date	(a) Actuarial Value of Valuation Assets	(b) Actuarial Accrued Liabilities	(b-a) Unfunded Actuarial Accrued Liabilities (UAAL)	(a/b) Funded Ratio	(c) Covered Payroll[1]	[(b-a)/c] UAAL as a Percentage of Covered Payroll
June 30, 2010[2]	$ 38,839,392	$ 46,646,838	$ 7,807,446	83.3%	$ 6,695,439	116.6%
June 30, 2011[2]	39,193,627	48,598,166	9,404,539	80.6%	6,650,674	141.4%
June 30, 2012[2]	39,039,364	50,809,425	11,770,061	76.8%	6,619,816	177.8%
June 30, 2013[2]	39,932,416	53,247,776	13,315,360	75.0%	6,595,902	201.9%
June 30, 2014	43,654,462	54,942,453	11,287,991	79.5%	6,672,228	169.2%
June 30, 2015	47,328,270	56,819,215	9,490,945	83.3%	6,948,738	136.6%
June 30, 2016[2]	49,357,847	62,199,214	12,841,367	79.4%	7,279,777	176.4%
June 30, 2017	52,166,307	65,310,803	13,144,496	79.9%	7,637,032	172.1%
June 30, 2018	55,233,108	68,527,354	13,294,246	80.6%	7,957,981	167.1%
June 30, 2019[2]	57,617,288	74,635,840	17,018,552	77.2%	8,370,050	203.3%

1. Covered Payroll includes compensation paid to all active employees on which contributions are calculated, as reported by LACERA. Covered Payroll differs from the Active Member Valuation Payroll shown in Table C-1, which is an annualized compensation of only those members who were active on the actuarial valuation date.

2. Assumption changes.

Exhibit 14
Schedule of Contributions from the Employer

(Dollars in Thousands)

		Actual Employer Contributions			
Fiscal Year Ending	Actuarially Determined Employer Contribution	Cash Payment	Transfer from Reserve Accounts	Total	Percentage of Actuarially Determined Contribution Contributed
06/30/2010	$ 843,704	$ 843,703	$ -	$ 843,703	100%
06/30/2011	944,174	944,174	-	944,174	100%
06/30/2012	1,078,929	1,078,929	-	1,078,929	100%
06/30/2013	1,172,014	723,195	448,819	1,172,014	100%
06/30/2014	1,320,442	1,320,442	-	1,320,442	100%
06/30/2015	1,494,975	1,494,975	-	1,494,975	100%
06/30/2016	1,443,130	1,443,130	-	1,443,130	100%
06/30/2017 (1)	1,392,813	1,370,922	21,891	1,392,813	100%
06/30/2018	1,564,284	1,564,284	-	1,564,284	100%
06/30/2019	1,708,122	1,708,122	-	1,708,122	100%

1. The County Contribution Reserve was used to offset the contribution required from the Courts in the fiscal year ended June 30, 2017. Exhibit 14 in the June 30, 2017 actuarial valuation report did not reflect this transfer amount.

Exhibit 15
Solvency Test

(Dollars in Millions)

		Actuarial Accrued Liabilities for			Portion of Actuarial Accrued Liabilities Covered by Assets		
Actuarial Valuation Date	Actuarial Value of Valuation Assets	Active Member Contributions (A)	Retirees and Beneficiaries[1] (B)	Active Members (Employer Financed Portion) (C)	(A)	(B)	(C)
June 30, 2010	$ 38,839	$ 6,278	$ 26,220	$ 14,148	100%	100%	45%
June 30, 2011	39,194	6,529	27,559	14,511	100%	100%	35%
June 30, 2012	39,039	6,961	29,118	14,730	100%	100%	20%
June 30, 2013	39,932	7,837	30,980	14,430	100%	100%	8%
June 30, 2014	43,654	8,354	31,882	14,706	100%	100%	23%
June 30, 2015	47,328	8,805	32,734	15,280	100%	100%	38%
June 30, 2016	49,358	8,767	35,316	18,116	100%	100%	29%
June 30, 2017	52,166	9,482	37,077	18,752	100%	100%	30%
June 30, 2018	55,233	9,882	39,192	19,453	100%	100%	32%
June 30, 2019	57,617	10,210	42,235	22,190	100%	100%	23%

1. Includes vested and non-vested former members.

Exhibit 16
Actuarial Analysis of Financial Experience

(Dollars in Millions)

	Valuation as of June 30						
	2013	2014	2015	2016	2017	2018	2019
Unfunded Actuarial Accrued Liability	$11,770	$13,315	$11,288	$9,491	$12,841	$13,145	$13,294
Expected Increase/(Decrease) from Prior Valuation	869	338	(54)	(102)	320	146	25
Salary Increases Greater/(Less) than Expected	(563)	(291)	79	162	277	223	486
CPI Less than Expected	(190)	(427)	(570)	(191)	(139)	45	44
Change in Assumptions	511	-	-	2,922	-	-	2,528
Asset Return Less/(Greater) than Expected	893	(1,664)	(1,263)	496	(421)	(411)	477
All Other Experience	25	17	11	63	267	146	164
Ending Unfunded Actuarial Accrued Liability	**$13,315**	**$11,288**	**$9,491**	**$12,841**	**$13,145**	**$13,294**	**$17,018**

Exhibit 17
Retirants and Beneficiaries added to and removed from Retiree Payroll

(Dollars in Thousands)

	Added to Rolls		Removed from Rolls		Rolls at End of Year			
Valuation Date	Member Count	Annual Allowance[1]	Member Count	Annual Allowance[1]	Member Count	Annual Allowance[1]	% Increase in Retiree Allowance	Average Annual Allowance
June 30, 2010	2,947	$ 188,724 [2]	(1,820)	$ (54,105)	54,196 [3]	$ 2,220,344	6.45%	$ 41.0
June 30, 2011	3,134	185,204 [2]	(1,959)	(62,923)	55,371	2,342,625	5.51%	42.3
June 30, 2012	3,194	193,865 [2]	(1,795)	(61,588)	56,770 [3]	2,474,902	5.65%	43.6
June 30, 2013	3,373	205,659 [2]	(2,057)	(69,494)	58,086 [3]	2,611,067	5.50%	45.0
June 30, 2014	3,128	172,743 [2]	(1,985)	(71,730)	59,229 [3]	2,712,080	3.87%	45.8
June 30, 2015	3,501	180,549 [2]	(2,124)	(80,028)	60,606 [3]	2,812,601	3.71%	46.4
June 30, 2016	3,479	220,632 [2]	(2,171)	(80,881)	61,914 [3]	2,952,352	4.97%	47.7
June 30, 2017	3,721	245,915 [2]	(2,311)	(89,624)	63,324 [3]	3,108,643	5.29%	49.1
June 30, 2018	3,826	276,118 [2]	(2,270)	(89,033)	64,880 [3]	3,295,728	6.02%	50.8
June 30, 2019	3,978	302,022 [2]	(2,351)	(97,840)	66,507 [3]	3,499,910	6.20%	52.6

1. Annual allowance is the monthly benefit allowance annualized for those members counted as of June 30.

2. Includes COLAs that occurred during the fiscal year and therefore were not included in the previous years' Annual Allowance totals.

3. For the actuarial valuation year, Member Count includes retirees who due to timing at year end, are not yet included in the total Retired Members count disclosed in Note A - Plan Description of LACERA's CAFR for the fiscal year ended June 30, 2018.

8. Cash Flow History and Projections

Exhibits 18a and 18b contain tables and graphs that illustrate both the cash flow history for the past 10 years and a projection on the valuation basis for the next 10 years.

Contributions include both employer and member contributions. Exhibit 18a shows that net cash outflow has gradually increased over the last five years. In future years, after the phase-in of the rate increase due to assumption changes and methods, the cash flow is expected to become increasingly negative. This is a typical pattern for a mature retirement plan where it is expected that contributions will be less than benefits and that the plan will begin drawing on the fund that has been built up over prior years.

Note that the actual cash contributions do not reflect the transfers made between reserve funds, but only cash coming into the Plan. We are assuming no further transfers, only full cash contributions. In addition, LACERA will receive dividends and interest payments from its investments. These types of payments are not considered for this analysis, which focuses solely on comparing contributions with benefit payments and administrative expenses.

The projected cash flows include contributions, statutory benefits, and administrative expenses only. They are based on the actuarial assumptions as stated in Appendix A of this valuation report. The total employer contribution rate is assumed to be 20.91% for the first year and 22.59% for the second year; total employer contributions for the remainder of the period reflect the expected recognition of asset gains currently being deferred and the phase-in of the increase due to the assumption and method changes. The aggregate member rate is assumed to stay at the calculated rate for June 30, 2019 of 7.68% of payroll. Expenses are based on the expenses for the year ended June 30, 2019, increased annually with the actuarial inflation assumption of 2.75%.

Any increases or reductions in future contribution rates will increase or decrease the net cash flow. The projected cash flows do not include:

- Projected STAR benefits that have not yet been granted. STAR benefits that were vested as of January 2019 are included.
- Projected benefits payable under certain insurance contracts for a group of retired members. These payments are netted against the total expected retiree benefits.

Exhibit 18a
Cash Flow History and Projections – Dollars

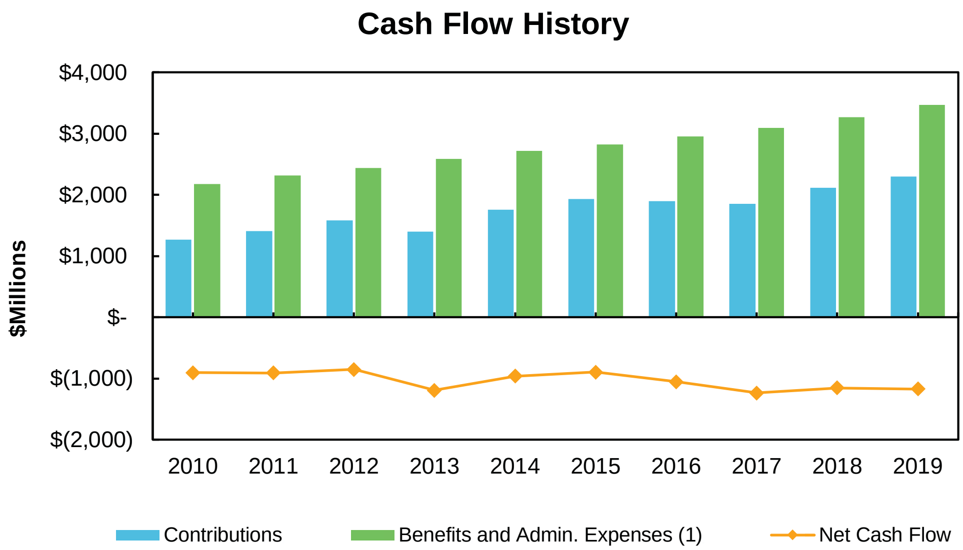
Plan Year Ending	Cash Flow History		
	Total Contributions	Benefits & Administrative Expenses(1)	Net Cash Flow
2010	$ 1,273	$ 2,177	$ (904)
2011	1,408	2,318	(910)
2012	1,586	2,439	(853)
2013	1,403	2,593	(1,190)
2014	1,759	2,719	(960)
2015	1,936	2,829	(893)
2016	1,902	2,954	(1,052)
2017	1,858	3,094	(1,236)
2018	2,116	3,268	(1,152)
2019	2,304	3,475	(1,171)

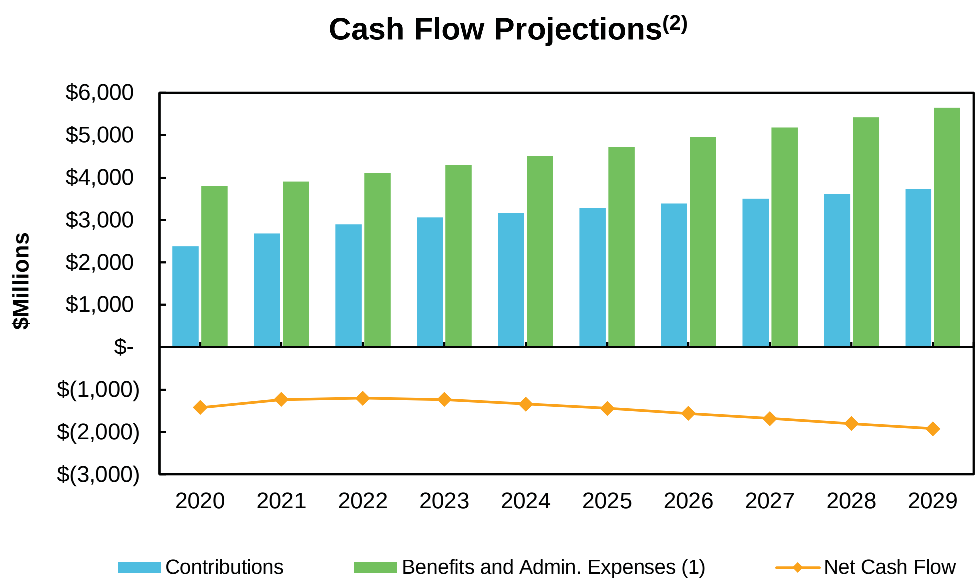
Plan Year Ending	Cash Flow Projections(2)		
	Total Contributions	Benefits & Administrative Expenses(1)	Net Cash Flow
2020	$ 2,378	$ 3,803	$ (1,424)
2021	2,675	3,910	(1,235)
2022	2,898	4,101	(1,204)
2023	3,062	4,299	(1,238)
2024	3,163	4,509	(1,346)
2025	3,282	4,727	(1,445)
2026	3,387	4,953	(1,565)
2027	3,498	5,183	(1,686)
2028	3,611	5,417	(1,805)
2029	3,729	5,654	(1,925)

1. Investment expenses are assumed to be covered by investment return.

2. Future contributions reflect the expected impact of asset gains and losses currently being deferred.

Exhibit 18b
Cash Flow History and Projections – Graphs





1. Investment expenses are assumed to be covered by investment return.

2. Future contributions reflect the expected impact of asset gains and losses currently being deferred.

9. Risk Discussion

Overview

The results of any actuarial valuation are based on one set of reasonable assumptions. Although we believe the current assumptions provide a reasonable estimate of future expectations, it is almost certain that future experience will differ from the assumptions to some extent. It is therefore important to consider the potential impacts of these likely differences when making decisions that may affect the future financial health of the Plan, or of the Plan's members.

Actuarial Standard of Practice No. 51 (ASOP 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions) addresses these issues by providing actuaries with guidance for assessing and disclosing the risk associated with measuring pension liabilities and the determination of pension plan contributions. Specifically, it directs the actuary to:

- Identify risks that may be significant to the Plan.
- Assess the risks identified as significant to the Plan. The assessment does not need to include numerical calculations.
- Disclose plan maturity measures and historical information that are significant to understanding the Plan's risks.

ASOP 51 states that if in the actuary's professional judgment, a more detailed assessment would be significantly beneficial in helping the individuals responsible for the Plan to understand the risks identified by the actuary, then the actuary should recommend that such an assessment be performed. The standard is first effective for certain actuarial work products with a measurement date on or after November 1, 2018, so for LACERA it was first effective with the June 30, 2019 actuarial valuation.

In addition, the California Actuarial Advisory Panel (CAAP) has adopted a set of model disclosure elements for actuarial valuation reports of public retirement systems in California. Most of these elements are included in other areas of this report. The remaining CAAP-recommended disclosures are as follows:

Disclosure Element	Description	Value
Gross Normal Cost $ [1]	Normal Cost allocated to valuation year, paid at mid-year.	$ 1,586.7
Statutory Contribution $ [1]	Expected Employer Contribution paid at mid-year.	$ 1,789.5
Asset Smoothing Ratio	Actuarial Value of Assets divided by Market Value of Assets	99.8%
Asset Volatility Ratio	Market Value of Assets divided by Payroll	6.9
Liability Volatility Ratio	Actuarial Accrued Liability divided by Payroll	8.9

1. Amounts shown in millions of dollars

This Section 9 uses the framework of ASOP 51 and the Asset and Liability Volatility Ratios shown above to communicate important information about: significant risks to the Plan, the Plan's maturity, and relevant historical plan data.

Asset and Liability Volatility Ratios

Asset and Liability Volatility Ratios are a measure of the level of assets (or liabilities) to payroll. In general, a higher ratio means that the employer contribution rates (ECR) are more sensitive to changes in levels of assets or liabilities. Historical Asset and Liability Volatility Ratios are shown in Exhibit E-4.

As shown above, in the current valuation LACERA has an Asset Volatility Ratio of 6.9 and a Liability Volatility Ratio of 8.9. As shown in Exhibit E-4, these ratios have increased over time as LACERA has matured.

Factors Affecting Future Results

There are a number of factors that affect future valuation results. To the extent actual experience for these factors varies from the assumptions, this will likely cause either increases or decreases in the plan's future funding level and ECR. The factors that can have the most significant impact on LACERA's valuation results are:

- Investment returns

  To the extent that actual investment returns differ from the assumed investment return, the Plan's future assets, ECR, and funded status may differ significantly from those presented in this valuation. Additional discussion of the impact of variance of investment returns is included below.

- Compensation increases

  Individual member retirement benefits are linked to that member's compensation. As such, assumptions need to be made as to a member's future compensation increases. Higher future compensation increases will generally result in larger retirement benefits, liabilities, ECRs, and a lower funded status. Conversely, lower compensation increases than assumed will generally result in smaller retirement benefits, liabilities, ECRs, and a higher funded status.

- Payroll variation

  In the valuation, an assumption is made for the overall rate of payroll growth of LACERA from year-to-year. To the extent that the overall rate of payroll growth is greater than assumed, the ECR may decrease since the UAAL will be amortized over a larger payroll base. The opposite will occur if the overall rate of payroll growth is lower than assumed.

  This effect often will offset somewhat with individual compensation increases, discussed above.

- Longevity and other demographic risks

  The liabilities reported in this valuation have been calculated by assuming that members will follow specific patterns of demographic experience (e.g., mortality, retirement, termination, disability) as described in Appendix A. To the extent that actual demographic experience is different than is assumed to occur, future liabilities, ECRs, and funded status may differ from that presented in this valuation.

All of these assumptions are reviewed in detail during the triennial Investigation of Experience study, and are also reviewed annually during the valuation process. Changes in assumptions are generally recommended as part of the triennial Investigation of Experience if actual experience has been materially different than assumed or forecasts have changed significantly. Additionally, changes may be recommended and discussed at each valuation if they are deemed to be appropriate at that time.

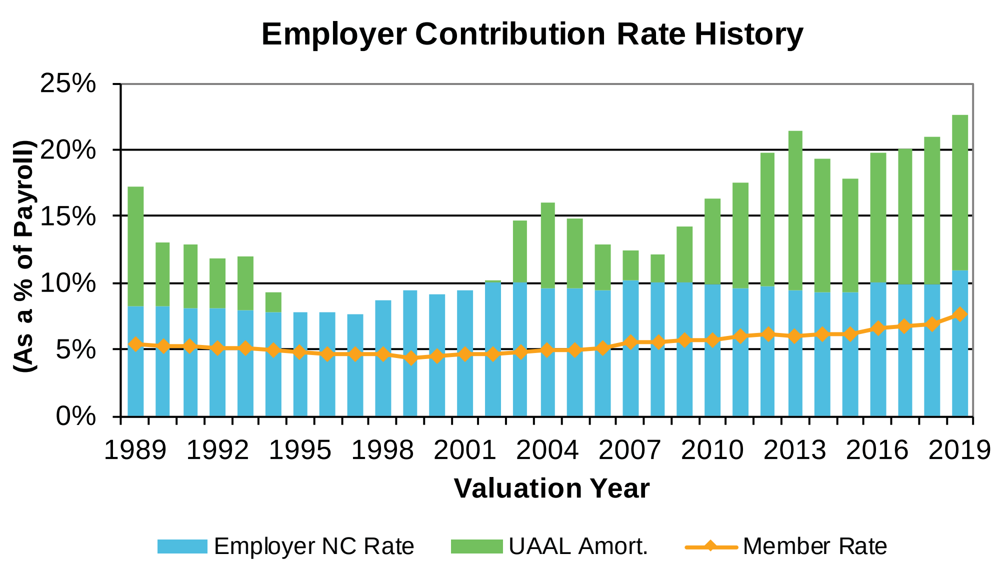
Discussion of Investment Return Risk

Of these factors, we believe the factor with the greatest potential risk to impact future valuation results for LACERA is future investment returns. For example, if actual returns fall short of the current assumption of 7.0% per year, this will cause an increase in the ECR and a decrease in the Funded Ratio, all other things being equal. Conversely, if actual returns exceed the current assumption of 7.0% per year, this will cause a decrease in the ECR and an increase in the Funded Ratio.

The magnitude of the increase or decrease in the ECR is affected by the maturity level, and specifically, the asset volatility ratio. LACERA has accumulated a significant amount of assets relative to its payroll and by several measures is considered a mature plan. Accumulating assets to pay for future benefit obligations is responsible funding, but it does mean that changes in the investment markets can have a significant impact on the ECR.

Historical Variation in Employer Contribution Rate

One way to assess future risks is to look at historical measurements. The following graph shows how the ECR has varied over the last 30 years under various investment return and assumption environments.



Appendix A Actuarial Procedures and Assumptions

The actuarial procedures and assumptions used in this valuation are described in this section. The assumptions were reviewed and changed for the June 30, 2019 actuarial valuation as a result of the 2019 triennial Investigation of Experience Study.

The actuarial assumptions used in the valuations are intended to estimate the future experience of the members of LACERA and of LACERA itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in the estimated costs of LACERA's benefits.

Table A-1 summarizes the assumptions. The mortality probabilities are taken from the sources listed.

Tables A-2 and A-3 show how members are expected to leave retired status due to death.

Table A-4 presents the probability of refund of contributions upon termination of employment while vested.

Table A-5 presents the expected annual percentage increase in salaries.

Tables A-6 to A-13 were developed from the experience as measured by the 2019 Investigation of Experience Study. These are the probability that a member will leave the System for various reasons.

Actuarial Cost Method

The actuarial valuation is prepared using the entry age actuarial cost method (CERL 31453.5). Under the principles of this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit (until maximum retirement age).

For members who transferred between plans, entry age is based on original entry into the System.

The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets, and (b) the actuarial present value of future normal costs is called the Unfunded Actuarial Accrued Liability (UAAL). The original UAAL as of June 30, 2009 is amortized as a level percentage of the projected salaries of present and future members of LACERA over a closed 30-year period. As of the June 30, 2019 valuation, all amortization layers with periods greater than 22 years as of July 1, 2020 were amortized over a 22-year period. Future gains and losses are amortized over new closed 20-year periods, beginning with the date the contribution is first expected to be made. This is referred to as “layered” amortization.

For General Plan G and Safety Plan C, the normal cost rate is rounded up to the nearest 0.02%.

Records and Data

The data used in this valuation consists of financial information and the age, service, and income records for active and inactive members and their survivors. All of the data were supplied by LACERA and are accepted for valuation purposes without audit.

Replacement of Former Members

The ages and relative salaries at entry of future members are assumed to follow a new entrant distribution based on the pattern of current members. Under this assumption, the normal cost rates for active members will remain fairly stable in future years unless there are changes in the governing law, the actuarial assumptions, or the pattern of the new entrants.

Growth in Membership

For benefit determination purposes, no growth in the membership of LACERA is assumed. For funding purposes, if amortization is required, the total payroll of covered members is assumed to grow due to the combined effects of future wage increases of current active members and the replacement of the current active members by new employees. No growth or decline in the total number of active members is assumed.

Internal Revenue Code Section 415 Limit

The Internal Revenue Code Section 415 maximum benefit limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

Internal Revenue Code Section 401(a)(17)

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

Employer Contributions

The employer contribution rate is set by the Board of Investments based on actuarial valuations.

Member Contributions

The member contribution rates vary by entry age (except for PEPRA plans) and are described in the law. Code references are shown in Appendix B of the valuation report. The methods and assumptions used are detailed later in this section.

The individual member rates by entry age, plan, and class are illustrated in Appendix D of the valuation report.

Valuation of Assets

The assets are valued using a five-year smoothed method based on the difference between the expected market value and the actual market value of the assets as of the valuation date. The expected market value is the prior year's market value increased with the net increase in the cash flow of funds, all increased with interest during the past fiscal year at the expected investment return rate assumption. The five-year smoothing valuation basis for all assets was adopted effective June 30, 2009.

Investment Earnings and Expenses

The future investment earnings of the assets of LACERA are assumed to accrue at an annual rate of 7.00% compounded annually, net of both investment and administrative expenses. This rate was adopted June 30, 2019.

Postretirement Benefit Increases

Postretirement increases are assumed for the valuation in accordance with the benefits provided as described in Appendix B. These adjustments are assumed payable each year in the future as they are not greater than the expected increase in the Consumer Price Index of 2.75% per year. This rate was adopted June 30, 2016.

Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 7.00% compounded semi-annually for an annualized rate of 7.12%. This rate was adopted effective June 30, 2019.

Future Salaries

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Table A-5. In addition to increases in salary due to promotions and longevity, this scale includes an assumed 3.25% per annum rate of increase in the general wage level of the membership. These rates were adopted June 30, 2019.

Increases are assumed to occur mid-year (i.e., January 1st) and only apply to base salary, excluding megaflex compensation. The mid-year timing reflects that salary increases occur throughout the year, or on average mid-year.

For plans with a one-year final average compensation period, actual average annual compensation is used. For Plan E, Plan G and Safety Plan C, the monthly rate as of June of the valuation year was annualized. Due to irregular compensation payments now included as pensionable earnings, actual annual pay is preferred over annualizing a single monthly payment amount.

Social Security Wage Base

Plan E members have their benefits offset by an assumed Social Security Benefit. For valuation funding purposes, we need to project the Social Security Benefit. We assume the current Social Security provisions will continue and the annual Wage Base will increase at the rate of 3.25% per year. Note that statutory provisions describe exactly how to compute the offset for purposes of determining a member's offset amount at time of termination or retirement. This rate was adopted June 30, 2016.

Note also, that it is assumed all Plan E members born after 1950 have less than 10 years of Social Security-covered service and, therefore, do not have their benefit offset.

General Plan G and Safety Plan C members have their compensation limited to approximately 120% of the Social Security Wage Base. The limit for 2019 is $149,016 (after applying the 120% factor) and is projected to increase at the CPI rate of 2.75%. This rate of future increase was adopted effective June 30, 2016.

Retirement

Members in General Plans A-D may retire at age 50 with 10 years of service, or any age with 30 years of service, or age 70 regardless of the number of years of service. General Plan G members are eligible to retire at age 52 with 5 years of service, or age 70 regardless of the number of years of service. Non-contributory Plan E members may retire at age 55 with 10 years of service. Members of Safety Plans A and B may retire at age 50 with 10 years of service, or any age with 20 years of service. Safety Plan C members are eligible to retire at age 50 with 5 years of County service. Retirement probabilities vary by age and are shown by plan in Tables A-6 through A-13.

All general members who attain or have attained age 75 in active service and all safety members who attain or have attained age 65 in active service are assumed to retire immediately (except for Safety Plan C members who have not yet attained 5 years of service).

Vested former members are assumed to retire at the later of their current age and the assumed retirement age specified as follows:

Assumption for Deferred Commencement	
Plan	**Age at Commencement**
GA	62
GB	62
GC	62
GD	59
GE	62
GG	57
SA	55
SB	50
SC	50

The assumptions regarding termination of employment, early retirement, and unreduced service retirement are treated as a single set of decrements in regards to a particular member. For example, a General Plan D member hired at age 30 has a probability of withdrawing from LACERA due to death, disability or other termination of employment until age 50. After age 50, the member can withdraw due to death, disability, or retirement. Thus, in no year during the member's projected employment would the member be eligible for both a probability of other termination of employment and a probability of retirement.

The retirement probabilities were adopted June 30, 2019.

Disability

The probabilities of disability used in the valuation are also illustrated in Tables A-6 through A-13. These probabilities were adopted June 30, 2019.

Postretirement Mortality – Other Than Disabled Members

The same postretirement mortality probabilities are used in the valuation for members retired for service and beneficiaries. These probabilities are illustrated in Table A-2. Current beneficiary mortality is assumed to be the same as for healthy members of the same sex. Future beneficiaries are assumed to be of the opposite sex and have the same mortality as General members. The amount-weighted Pub-2010 mortality tables are used.

Note that these assumptions include a projection for expected future mortality improvement. These probabilities were adopted June 30, 2019.

Males — General members: PubG-2010 Healthy Retiree Mortality Table for Males, with MP-2014 Ultimate Projection Scale.

Safety members: PubS-2010 Healthy Retiree Mortality Table for Males multiplied by 85%, with MP-2014 Ultimate Projection Scale.

Females — General members: PubG-2010 Healthy Retiree Mortality Table for Females multiplied by 110%, with MP-2014 Ultimate Projection Scale.

Safety members: PubS-2010 Healthy Retiree Mortality Table for Females, with MP-2014 Ultimate Projection Scale.

Postretirement Mortality – Disabled Members

For members retired for disability, the mortality probabilities used in the valuation are illustrated in Table A-3. The amount-weighted Pub-2010 mortality tables are used.

Note that these assumptions include a projection for expected future mortality improvement. These probabilities were adopted June 30, 2019.

Males General members: Average of PubG-2010 Healthy Retiree Mortality Table for Males and PubG-2010 Disabled Retiree Mortality Table for Males, both projected with MP-2014 Ultimate Projection Scale.

Safety members: PubS-2010 Healthy Retiree Mortality Table for Males, with MP-2014 Ultimate Projection Scale.

Females General members: Average of PubG-2010 Healthy Retiree Mortality Table for Females and PubG-2010 Disabled Retiree Mortality Table for Females, both projected with MP-2014 Ultimate Projection Scale.

Safety members: PubS-2010 Healthy Retiree Mortality Table for Females, with MP-2014 Ultimate Projection Scale.

Mortality while in Active Status

For active members, the mortality probabilities used in the valuation are illustrated in Tables A-6 through A-13. The amount-weighted Pub-2010 mortality tables are used. These probabilities were adopted June 30, 2019.

Class	Gender	Proposed Table
General	Male	PubG-2010 (120%) Employee Male(1)
General	Female	PubG-2010 (130%) Employee Female(1)
Safety	Male	PubS-2010 (100%) Employee Male(1)
Safety	Female	PubS-2010 (100%) Employee Female(1)

1. Projected using the MP-2014 Ultimate projection scale.

Note that Safety members have an additional service-connected mortality probability of 0.01% per year.

Other Employment Terminations

Tables A-6 to A-13 show, for all ages, the probabilities assumed in this valuation for future termination from active service other than for death, disability, or retirement. These probabilities do not apply to members eligible for service retirement. These probabilities were adopted June 30, 2019.

Terminating employees may withdraw their contributions immediately upon termination of employment and forfeit the right to further benefits, or they may leave their contributions with LACERA. Former contributing members whose contributions are on deposit may later elect to receive a refund, may return to work, or may remain inactive until becoming eligible to receive a retirement benefit under either LACERA or a reciprocal retirement system. All terminating members who are not eligible for vested benefits are assumed to withdraw their contributions immediately. It is assumed that all terminating members will not be rehired in the future.

Table A-4 gives the assumed probabilities that vested members will withdraw their contributions and elect a refund immediately upon termination and the probability that remaining members will elect a deferred vested benefit. All non-vested members are assumed to elect a refund and withdraw their contributions. These probabilities were adopted June 30, 2019.

Probability of Eligible Survivors

For members not currently in pay status, 77% of all males and 50% of all females are assumed to have eligible survivors (spouses or qualified domestic partners). Survivors are assumed to be four years younger than male members and two years older than female members. Survivors are assumed to be of the opposite gender as the member. There is no explicit assumption for children's benefits. We believe the survivor benefits based on this assumption are sufficient to cover children's benefits as they occur.

Valuation of Vested Former Members

The deferred retirement benefit is calculated based on the member's final compensation and service at termination. The compensation amount is projected until the assumed retirement age for members who are assumed to be employed by a reciprocal agency. For members who are missing compensation data, Final Compensation is estimated as the average amount for all members who terminated during the same year and had a valid compensation amount. The greater of the present value of the calculated benefit and the employee's current contribution balance is valued for future deferred vested members.

Reciprocal Employment

16% of General and 35% of Safety current and future vested former members are assumed to work for a reciprocal employer.

Current vested reciprocal members are assumed to receive annual salary increases of 4.25%. Future reciprocal vested members are assumed to receive the same salary increases they would have received if they had stayed in active employment with LACERA and retired at the assumed retirement age.

Valuation of Annuity Purchases

Over 30 years ago, LACERA purchased single life annuities from two insurance companies for some retired members (currently less than 1% of the retired population). The total liability for these members is calculated and then offset by the expected value of the benefit to be paid by the insurance companies.

For affected members, the insurance companies are responsible for:

1. Straight life annuity payments
2. Statutory COLAs

LACERA is responsible for:

1. Benefit payments payable to any beneficiary
2. STAR COLAs

Member Contribution Rate Assumptions

The following assumptions summarize the procedures used to compute member contribution rates based on entry age:

In general, the member rate is determined by the Present Value of the Future Benefit (PVFB) payable at retirement age, divided by the present value of all future salaries payable between age at entry and retirement age. For these purposes, per the CERL:

A. The Annuity factor used for general members is based on a 35% / 65% blend of the male and female valuation mortality tables and projection scale, with a static projection to 2041. For Safety members, it is based on a 85% / 15% blend of the male and female annuity factors determined using the same mortality tables as used for service-retired members.

B. The annuity factor used in determining the present value of future benefits (PVFB) at entry age is equal to the life only annuity factor at 7.00%.

C. The Final Compensation is based on the salary paid in the year prior to attaining the retirement age.

   Example: For a General Plan C Member who enters at age 59 or earlier, the Final Compensation at retirement (age 60) will be the monthly average of the annual salaries during age 59.

D. Member Rates are assumed to increase with entry age. There are a few exceptions at the higher entry ages where the calculated rate is less than the previous entry age. In these cases the member contribution rate is adjusted so that it is no less than the value for the previous entry age.

Table A-1
Summary of Valuation Assumptions as of June 30, 2019

I. Economic assumptions

A.	General wage increases	3.25%
B.	Investment earnings	7.00%
C.	Growth in membership	0.00%
D.	Postretirement benefit increases (varies by plan)	Plan COLA not greater than CPI assumption.
E.	CPI inflation assumption	2.75%

II. Demographic assumptions

A.	Salary increases due to service	Table A-5
B.	Retirement	Tables A-6 to A-13
C.	Disability	Tables A-6 to A-13
D.	Mortality during active employment	Tables A-6 to A-13
E.	Mortality for active members after termination and service retired members[1]	Table A-2

Class	Gender	
General	Male	PubG-2010 (100%) Healthy Retiree Male
General	Female	PubG-2010 (110%) Healthy Retiree Female
Safety	Male	PubS-2010 (85%) Healthy Retiree Male
Safety	Female	PubS-2010 (100%) Healthy Retiree Female

F. Mortality among disabled members[1] — Table A-3

Class	Gender	
General	Male	Avg of: PubG-2010 (100%) Healthy Retiree Male PubG-2010 (100%) Disabled Retiree Male
General	Female	Avg of: PubG-2010 (100%) Healthy Retiree Female PubG-2010 (100%) Disabled Retiree Female
Safety	Male	PubS-2010 (100%) Healthy Retiree Male
Safety	Female	PubS-2010 (100%) Healthy Retiree Female

G. Mortality for beneficiaries[1] — Table A-2

Basis – Beneficiaries are assumed to have the same mortality as a general member of the opposite gender who has taken a service retirement.

H.	Other terminations of employment	Tables A-6 to A-13
I.	Refund of contributions on vested termination	Table A-4

1. All mortality probabilities are projected using the MP-2014 Ultimate projection scale.

Table A-2
Mortality for Members Retired for Service[1]

Age	Safety Male	Safety Female	General Male	General Female
20	0.0520%	0.0210%	0.0740%	0.0380%
25	0.0470%	0.0260%	0.0560%	0.0260%
30	0.0520%	0.0350%	0.0720%	0.0440%
35	0.0590%	0.0470%	0.0940%	0.0680%
40	0.0750%	0.0640%	0.1320%	0.1060%
45	0.1037%	0.0870%	0.1960%	0.1650%
50	0.1632%	0.1490%	0.2980%	0.2442%
55	0.2601%	0.2580%	0.4310%	0.3146%
60	0.4318%	0.4460%	0.6150%	0.4224%
65	0.7489%	0.7700%	0.9130%	0.6743%
70	1.3328%	1.3290%	1.5260%	1.1693%
75	2.4021%	2.2950%	2.6710%	2.0713%
80	4.3376%	3.9620%	4.7740%	3.6960%
85	7.7648%	6.8420%	8.5910%	6.8255%
90	13.4810%	11.8150%	14.6720%	12.6357%

Annual Projected Mortality Improvement

Age	All Groups
65 & Less	1.000%
70	1.000%
75	1.000%
80	1.000%
85	1.000%
90	0.930%
95	0.850%
100	0.640%
105	0.430%
110	0.210%
115	0.000%

1. *Mortality probabilities are those applicable for the fiscal year beginning in 2010. Annual projected improvements are assumed in the following years under the schedule shown. For example, the annual mortality probability for an 85-year old Safety male in fiscal year beginning in 2019 is 7.0933% calculated as follows:*

Age 85 probability in 2019 = Age 85 probability in 2010 with 9 years improvement
= 7.7648% x (100.0% - 1.0%) ^ 9
= 7.0933%

Table A-3
Mortality for Members Retired for Disability[1]

Age	Safety Male	Safety Female	General Male	General Female
20	0.0610%	0.0210%	0.2430%	0.1340%
25	0.0550%	0.0260%	0.1670%	0.0940%
30	0.0610%	0.0350%	0.2130%	0.1485%
35	0.0700%	0.0470%	0.2760%	0.2315%
40	0.0880%	0.0640%	0.3885%	0.3625%
45	0.1220%	0.0870%	0.6015%	0.5675%
50	0.1920%	0.1490%	0.9515%	0.8525%
55	0.3060%	0.2580%	1.2725%	1.0140%
60	0.5080%	0.4460%	1.5590%	1.1700%
65	0.8810%	0.7700%	1.9785%	1.4345%
70	1.5680%	1.3290%	2.7135%	1.9625%
75	2.8260%	2.2950%	3.9315%	2.9430%
80	5.1030%	3.9620%	6.0610%	4.6835%
85	9.1350%	6.8420%	9.7030%	7.7680%
90	15.8600%	11.8150%	15.4625%	12.5760%

1. Mortality probabilities are those applicable for the fiscal year beginning in 2010. Annual projected improvements are assumed in the following years under the schedule shown on the preceding page.

Table A-4
Immediate Refund of Contributions upon Termination of Employment
(Excludes Plan E)

Years of Service	General	Safety
0	100%	100%
1	100%	100%
2	100%	100%
3	100%	100%
4	100%	100%
5	32%	30%
6	32%	30%
7	32%	30%
8	32%	28%
9	31%	26%
10	31%	24%
11	30%	22%
12	30%	20%
13	29%	18%
14	28%	16%
15	26%	14%
16	25%	12%
17	24%	10%
18	22%	9%
19	21%	8%
20	19%	7%
21	18%	6%
22	16%	5%
23	14%	4%
24	12%	3%
25	10%	2%
26	8%	2%
27	6%	2%
28	4%	2%
29	2%	2%
30 & Above	0%	0%

Table A-5
Annual Increase in Salary[1]

Years of Service	General	Safety
<1	6.00%	9.00%
1	5.25%	8.50%
2	4.75%	8.00%
3	4.10%	6.00%
4	3.50%	4.50%
5	3.00%	3.25%
6	2.50%	2.50%
7	2.00%	2.00%
8	1.60%	1.50%
9	1.30%	1.35%
10	1.15%	1.20%
11	1.00%	1.05%
12	0.85%	0.95%
13	0.75%	0.85%
14	0.70%	0.75%
15	0.65%	0.70%
16	0.60%	0.65%
17	0.55%	0.60%
18	0.50%	0.55%
19	0.45%	2.25%
20	0.40%	0.50%
21	0.35%	0.50%
22	0.30%	0.50%
23	0.25%	0.50%
24	0.25%	3.00%
25	0.25%	0.50%
26	0.25%	0.50%
27	0.25%	0.50%
28	0.25%	0.50%
29	0.25%	3.00%
30 & Above	0.25%	0.50%

** The total expected increase in salary includes both merit (shown above) and the general wage increase assumption of 3.25% per annum increase. The total result is compounded rather than additive. For example, the total assumed increase for General members for service less than one year is 9.45%.*

Appendix A: Probabilities of Separation from Active Service
Tables A-6 to A-13

A schedule of the probabilities of termination of employment due to the following causes can be found on the following pages:

Service Retirement:	Member retires after meeting age and service requirements for reasons other than disability.
Withdrawal:	Member terminates and elects a refund of member contributions, or a deferred vested retirement benefit.
Service Disability:	Member receives disability retirement; disability is service related.
Ordinary Disability:	Member receives disability retirement; disability is not service related.
Service Death:	Member dies before retirement; death is service related.
Ordinary Death:	Member dies before retirement; death is not service related.

Each of these represents the probability that a member will separate from service at each age due to the particular cause. For example, a probability of 0.0300 for a member's service retirement at age 50 means we assume that 30 out of 1,000 members who are age 50 will retire at that age.

Each table represents the detailed probabilities needed for each LACERA plan by gender:

Table	A-6: General Plan A, B & C – Males	A-10: General Plan E – Males
	A-7: General Plan A, B & C – Females	A-11: General Plan E – Females
	A-8: General Plan D & G – Males	A-12: Safety Plan A, B & C – Males
	A-9: General Plan D & G – Females	A-13: Safety Plan A, B & C – Females

Table A-6
Probability of Separation from Active Service for General Members
Plans A, B & C – Male

Age	Service Retirement	Other Terminations	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.00000	0.00500	0.00010	0.00010	N/A	0.00043
19	0.00000	0.00500	0.00010	0.00010	N/A	0.00046
20	0.00000	0.00500	0.00010	0.00010	N/A	0.00044
21	0.00000	0.00500	0.00010	0.00010	N/A	0.00043
22	0.00000	0.00500	0.00010	0.00010	N/A	0.00040
23	0.00000	0.00500	0.00010	0.00010	N/A	0.00037
24	0.00000	0.00500	0.00010	0.00010	N/A	0.00035
25	0.00000	0.00500	0.00010	0.00010	N/A	0.00034
26	0.00000	0.00500	0.00010	0.00010	N/A	0.00036
27	0.00000	0.00500	0.00010	0.00010	N/A	0.00037
28	0.00000	0.00500	0.00010	0.00010	N/A	0.00040
29	0.00000	0.00500	0.00010	0.00010	N/A	0.00041
30	0.00000	0.00500	0.00010	0.00020	N/A	0.00043
31	0.00000	0.00500	0.00010	0.00020	N/A	0.00046
32	0.00000	0.00500	0.00010	0.00020	N/A	0.00048
33	0.00000	0.00500	0.00016	0.00020	N/A	0.00050
34	0.00000	0.00500	0.00022	0.00020	N/A	0.00053
35	0.00000	0.00500	0.00028	0.00020	N/A	0.00056
36	0.00000	0.00500	0.00034	0.00020	N/A	0.00060
37	0.00000	0.00500	0.00040	0.00020	N/A	0.00064
38	0.00000	0.00500	0.00048	0.00020	N/A	0.00068
39	0.00000	0.00500	0.00056	0.00020	N/A	0.00073
40	0.03000	0.00500	0.00064	0.00020	N/A	0.00079
41	0.03000	0.00500	0.00072	0.00020	N/A	0.00085
42	0.03000	0.00500	0.00080	0.00020	N/A	0.00092
43	0.03000	0.00500	0.00084	0.00024	N/A	0.00100
44	0.03000	0.00500	0.00088	0.00028	N/A	0.00108
45	0.03000	0.00500	0.00092	0.00032	N/A	0.00118
46	0.03000	0.00500	0.00096	0.00036	N/A	0.00128
47	0.03000	0.00500	0.00100	0.00040	N/A	0.00139
48	0.03000	0.00500	0.00104	0.00044	N/A	0.00152
49	0.03000	0.00500	0.00108	0.00048	N/A	0.00166
50	0.03000	0.00500	0.00112	0.00052	N/A	0.00179
51	0.03000	0.00500	0.00116	0.00056	N/A	0.00194
52	0.03000	0.00500	0.00120	0.00060	N/A	0.00210
53	0.03000	0.00500	0.00156	0.00064	N/A	0.00227
54	0.06000	0.00500	0.00192	0.00068	N/A	0.00244
55	0.10000	0.00500	0.00228	0.00072	N/A	0.00263
56	0.12000	0.00500	0.00264	0.00076	N/A	0.00283
57	0.17000	0.00500	0.00300	0.00080	N/A	0.00306
58	0.26000	0.00500	0.00330	0.00084	N/A	0.00330
59	0.26000	0.00500	0.00360	0.00088	N/A	0.00355
60	0.32000	0.00500	0.00390	0.00092	N/A	0.00383
61	0.32000	0.00500	0.00420	0.00096	N/A	0.00413
62	0.32000	0.00500	0.00450	0.00100	N/A	0.00445
63	0.32000	0.00500	0.00450	0.00104	N/A	0.00481
64	0.32000	0.00500	0.00450	0.00108	N/A	0.00520
65	0.32000	0.00500	0.00450	0.00112	N/A	0.00562
66	0.25000	0.00500	0.00450	0.00116	N/A	0.00607
67	0.24000	0.00500	0.00450	0.00120	N/A	0.00658
68	0.24000	0.00500	0.00450	0.00124	N/A	0.00713
69	0.24000	0.00500	0.00450	0.00128	N/A	0.00775
70	0.24000	0.00500	0.00450	0.00132	N/A	0.00844
71	0.24000	0.00500	0.00450	0.00136	N/A	0.00920
72	0.24000	0.00500	0.00450	0.00140	N/A	0.01004
73	0.24000	0.00500	0.00450	0.00144	N/A	0.01098
74	0.24000	0.00500	0.00450	0.00148	N/A	0.01201
75	1.00000	0.00000	0.00000	0.00000	N/A	0.01315

Table A-7
Probability of Separation from Active Service for General Members
Plans A, B & C – Female

Age	Service Retirement	Other Terminations	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.00000	0.00500	0.00015	0.00010	N/A	0.00017
19	0.00000	0.00500	0.00015	0.00010	N/A	0.00017
20	0.00000	0.00500	0.00015	0.00010	N/A	0.00017
21	0.00000	0.00500	0.00015	0.00010	N/A	0.00016
22	0.00000	0.00500	0.00015	0.00010	N/A	0.00014
23	0.00000	0.00500	0.00015	0.00010	N/A	0.00013
24	0.00000	0.00500	0.00015	0.00010	N/A	0.00012
25	0.00000	0.00500	0.00015	0.00010	N/A	0.00012
26	0.00000	0.00500	0.00015	0.00010	N/A	0.00013
27	0.00000	0.00500	0.00015	0.00010	N/A	0.00014
28	0.00000	0.00500	0.00015	0.00010	N/A	0.00016
29	0.00000	0.00500	0.00015	0.00010	N/A	0.00017
30	0.00000	0.00500	0.00015	0.00010	N/A	0.00020
31	0.00000	0.00500	0.00015	0.00010	N/A	0.00021
32	0.00000	0.00500	0.00015	0.00010	N/A	0.00023
33	0.00000	0.00500	0.00020	0.00010	N/A	0.00025
34	0.00000	0.00500	0.00025	0.00010	N/A	0.00027
35	0.00000	0.00500	0.00030	0.00010	N/A	0.00030
36	0.00000	0.00500	0.00035	0.00010	N/A	0.00033
37	0.00000	0.00500	0.00040	0.00010	N/A	0.00036
38	0.00000	0.00500	0.00042	0.00014	N/A	0.00039
39	0.00000	0.00500	0.00044	0.00018	N/A	0.00043
40	0.03000	0.00500	0.00046	0.00022	N/A	0.00047
41	0.03000	0.00500	0.00048	0.00026	N/A	0.00052
42	0.03000	0.00500	0.00050	0.00030	N/A	0.00056
43	0.03000	0.00500	0.00060	0.00032	N/A	0.00061
44	0.03000	0.00500	0.00070	0.00034	N/A	0.00066
45	0.03000	0.00500	0.00080	0.00036	N/A	0.00073
46	0.03000	0.00500	0.00090	0.00038	N/A	0.00079
47	0.03000	0.00500	0.00100	0.00040	N/A	0.00086
48	0.03000	0.00500	0.00110	0.00042	N/A	0.00092
49	0.03000	0.00500	0.00120	0.00044	N/A	0.00100
50	0.03000	0.00500	0.00130	0.00046	N/A	0.00108
51	0.03000	0.00500	0.00140	0.00048	N/A	0.00117
52	0.03000	0.00500	0.00150	0.00050	N/A	0.00126
53	0.03000	0.00500	0.00156	0.00052	N/A	0.00137
54	0.06000	0.00500	0.00162	0.00054	N/A	0.00147
55	0.10000	0.00500	0.00168	0.00056	N/A	0.00160
56	0.12000	0.00500	0.00174	0.00058	N/A	0.00173
57	0.17000	0.00500	0.00180	0.00060	N/A	0.00187
58	0.26000	0.00500	0.00194	0.00064	N/A	0.00203
59	0.26000	0.00500	0.00208	0.00068	N/A	0.00221
60	0.32000	0.00500	0.00222	0.00072	N/A	0.00242
61	0.32000	0.00500	0.00236	0.00076	N/A	0.00264
62	0.32000	0.00500	0.00250	0.00080	N/A	0.00289
63	0.32000	0.00500	0.00250	0.00084	N/A	0.00317
64	0.32000	0.00500	0.00250	0.00088	N/A	0.00350
65	0.32000	0.00500	0.00250	0.00092	N/A	0.00385
66	0.25000	0.00500	0.00250	0.00096	N/A	0.00425
67	0.24000	0.00500	0.00250	0.00100	N/A	0.00471
68	0.24000	0.00500	0.00250	0.00104	N/A	0.00520
69	0.24000	0.00500	0.00250	0.00108	N/A	0.00575
70	0.24000	0.00500	0.00250	0.00112	N/A	0.00636
71	0.24000	0.00500	0.00250	0.00116	N/A	0.00703
72	0.24000	0.00500	0.00250	0.00120	N/A	0.00777
73	0.24000	0.00500	0.00250	0.00124	N/A	0.00859
74	0.24000	0.00500	0.00250	0.00128	N/A	0.00950
75	1.00000	0.00000	0.00000	0.00000	N/A	0.01050

Table A-8
Probability of Separation from Active Service for General Members
Plan D & G – Male

Age	Service Retirement Plan D	Service Retirement Plan G	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.00000	0.00000	0.00010	0.00010	N/A	0.00043
19	0.00000	0.00000	0.00010	0.00010	N/A	0.00046
20	0.00000	0.00000	0.00010	0.00010	N/A	0.00044
21	0.00000	0.00000	0.00010	0.00010	N/A	0.00043
22	0.00000	0.00000	0.00010	0.00010	N/A	0.00040
23	0.00000	0.00000	0.00010	0.00010	N/A	0.00037
24	0.00000	0.00000	0.00010	0.00010	N/A	0.00035
25	0.00000	0.00000	0.00010	0.00010	N/A	0.00034
26	0.00000	0.00000	0.00010	0.00010	N/A	0.00036
27	0.00000	0.00000	0.00010	0.00010	N/A	0.00037
28	0.00000	0.00000	0.00010	0.00010	N/A	0.00040
29	0.00000	0.00000	0.00010	0.00010	N/A	0.00041
30	0.00000	0.00000	0.00010	0.00020	N/A	0.00043
31	0.00000	0.00000	0.00010	0.00020	N/A	0.00046
32	0.00000	0.00000	0.00010	0.00020	N/A	0.00048
33	0.00000	0.00000	0.00016	0.00020	N/A	0.00050
34	0.00000	0.00000	0.00022	0.00020	N/A	0.00053
35	0.00000	0.00000	0.00028	0.00020	N/A	0.00056
36	0.00000	0.00000	0.00034	0.00020	N/A	0.00060
37	0.00000	0.00000	0.00040	0.00020	N/A	0.00064
38	0.00000	0.00000	0.00048	0.00020	N/A	0.00068
39	0.00000	0.00000	0.00056	0.00020	N/A	0.00073
40	0.01500	0.00000	0.00064	0.00020	N/A	0.00079
41	0.01500	0.00000	0.00072	0.00020	N/A	0.00085
42	0.01500	0.00000	0.00080	0.00020	N/A	0.00092
43	0.01500	0.00000	0.00084	0.00024	N/A	0.00100
44	0.01500	0.00000	0.00088	0.00028	N/A	0.00108
45	0.01500	0.00000	0.00092	0.00032	N/A	0.00118
46	0.01500	0.00000	0.00096	0.00036	N/A	0.00128
47	0.01500	0.00000	0.00100	0.00040	N/A	0.00139
48	0.01500	0.00000	0.00104	0.00044	N/A	0.00152
49	0.01500	0.00000	0.00108	0.00048	N/A	0.00166
50	0.01500	0.01200	0.00112	0.00052	N/A	0.00179
51	0.01200	0.00960	0.00116	0.00056	N/A	0.00194
52	0.01200	0.00960	0.00120	0.00060	N/A	0.00210
53	0.01500	0.01200	0.00156	0.00064	N/A	0.00227
54	0.02000	0.01600	0.00192	0.00068	N/A	0.00244
55	0.02500	0.02000	0.00228	0.00072	N/A	0.00263
56	0.02500	0.02000	0.00264	0.00076	N/A	0.00283
57	0.03000	0.02400	0.00300	0.00080	N/A	0.00306
58	0.03500	0.02800	0.00330	0.00084	N/A	0.00330
59	0.05000	0.04000	0.00360	0.00088	N/A	0.00355
60	0.07000	0.05600	0.00390	0.00092	N/A	0.00383
61	0.08000	0.06400	0.00420	0.00096	N/A	0.00413
62	0.11000	0.11000	0.00450	0.00100	N/A	0.00445
63	0.11000	0.11000	0.00450	0.00104	N/A	0.00481
64	0.16000	0.16000	0.00450	0.00108	N/A	0.00520
65	0.23000	0.18000	0.00450	0.00112	N/A	0.00562
66	0.20000	0.18000	0.00450	0.00116	N/A	0.00607
67	0.19000	0.30000	0.00450	0.00120	N/A	0.00658
68	0.18000	0.18000	0.00450	0.00124	N/A	0.00713
69	0.20000	0.20000	0.00450	0.00128	N/A	0.00775
70	0.23000	0.23000	0.00450	0.00132	N/A	0.00844
71	0.20000	0.20000	0.00450	0.00136	N/A	0.00920
72	0.20000	0.20000	0.00450	0.00140	N/A	0.01004
73	0.20000	0.20000	0.00450	0.00144	N/A	0.01098
74	0.20000	0.20000	0.00450	0.00148	N/A	0.01201
75	1.00000	1.00000	0.00000	0.00000	N/A	0.01315

Years of Service	Other Terminations
0	0.07000
1	0.05500
2	0.04000
3	0.03250
4	0.02500
5	0.02330
6	0.02170
7	0.02000
8	0.01900
9	0.01800
10	0.01700
11	0.01600
12	0.01500
13	0.01400
14	0.01300
15	0.01200
16	0.01100
17	0.01000
18	0.00920
19	0.00840
20	0.00760
21	0.00680
22	0.00600
23	0.00560
24	0.00520
25	0.00480
26	0.00440
27	0.00400
28	0.00400
29	0.00400
30 & Above	0.00000

Table A-9
Probability of Separation from Active Service for General Members
Plan D & G – Female

Age	Service Retirement Plan D	Service Retirement Plan G	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.00000	0.00000	0.00015	0.00010	N/A	0.00017	0	0.07000
19	0.00000	0.00000	0.00015	0.00010	N/A	0.00017	1	0.05500
20	0.00000	0.00000	0.00015	0.00010	N/A	0.00017	2	0.04000
21	0.00000	0.00000	0.00015	0.00010	N/A	0.00016	3	0.03250
22	0.00000	0.00000	0.00015	0.00010	N/A	0.00014	4	0.02500
23	0.00000	0.00000	0.00015	0.00010	N/A	0.00013	5	0.02330
24	0.00000	0.00000	0.00015	0.00010	N/A	0.00012	6	0.02170
25	0.00000	0.00000	0.00015	0.00010	N/A	0.00012	7	0.02000
26	0.00000	0.00000	0.00015	0.00010	N/A	0.00013	8	0.01900
27	0.00000	0.00000	0.00015	0.00010	N/A	0.00014	9	0.01800
28	0.00000	0.00000	0.00015	0.00010	N/A	0.00016	10	0.01700
29	0.00000	0.00000	0.00015	0.00010	N/A	0.00017	11	0.01600
30	0.00000	0.00000	0.00015	0.00010	N/A	0.00020	12	0.01500
31	0.00000	0.00000	0.00015	0.00010	N/A	0.00021	13	0.01400
32	0.00000	0.00000	0.00015	0.00010	N/A	0.00023	14	0.01300
33	0.00000	0.00000	0.00020	0.00010	N/A	0.00025	15	0.01200
34	0.00000	0.00000	0.00025	0.00010	N/A	0.00027	16	0.01100
35	0.00000	0.00000	0.00030	0.00010	N/A	0.00030	17	0.01000
36	0.00000	0.00000	0.00035	0.00010	N/A	0.00033	18	0.00920
37	0.00000	0.00000	0.00040	0.00010	N/A	0.00036	19	0.00840
38	0.00000	0.00000	0.00042	0.00014	N/A	0.00039	20	0.00760
39	0.00000	0.00000	0.00044	0.00018	N/A	0.00043	21	0.00680
40	0.01500	0.00000	0.00046	0.00022	N/A	0.00047	22	0.00600
41	0.01500	0.00000	0.00048	0.00026	N/A	0.00052	23	0.00560
42	0.01500	0.00000	0.00050	0.00030	N/A	0.00056	24	0.00520
43	0.01500	0.00000	0.00060	0.00032	N/A	0.00061	25	0.00480
44	0.01500	0.00000	0.00070	0.00034	N/A	0.00066	26	0.00440
45	0.01500	0.00000	0.00080	0.00036	N/A	0.00073	27	0.00400
46	0.01500	0.00000	0.00090	0.00038	N/A	0.00079	28	0.00400
47	0.01500	0.00000	0.00100	0.00040	N/A	0.00086	29	0.00400
48	0.01500	0.00000	0.00110	0.00042	N/A	0.00092	30 & Above	0.00000
49	0.01500	0.00000	0.00120	0.00044	N/A	0.00100		
50	0.01500	0.01200	0.00130	0.00046	N/A	0.00108		
51	0.01200	0.00960	0.00140	0.00048	N/A	0.00117		
52	0.01200	0.00960	0.00150	0.00050	N/A	0.00126		
53	0.01500	0.01200	0.00156	0.00052	N/A	0.00137		
54	0.02000	0.01600	0.00162	0.00054	N/A	0.00147		
55	0.02500	0.02000	0.00168	0.00056	N/A	0.00160		
56	0.02500	0.02000	0.00174	0.00058	N/A	0.00173		
57	0.03000	0.02400	0.00180	0.00060	N/A	0.00187		
58	0.03500	0.02800	0.00194	0.00064	N/A	0.00203		
59	0.05000	0.04000	0.00208	0.00068	N/A	0.00221		
60	0.07000	0.05600	0.00222	0.00072	N/A	0.00242		
61	0.08000	0.06400	0.00236	0.00076	N/A	0.00264		
62	0.11000	0.11000	0.00250	0.00080	N/A	0.00289		
63	0.11000	0.11000	0.00250	0.00084	N/A	0.00317		
64	0.16000	0.16000	0.00250	0.00088	N/A	0.00350		
65	0.23000	0.18000	0.00250	0.00092	N/A	0.00385		
66	0.20000	0.18000	0.00250	0.00096	N/A	0.00425		
67	0.19000	0.30000	0.00250	0.00100	N/A	0.00471		
68	0.18000	0.18000	0.00250	0.00104	N/A	0.00520		
69	0.20000	0.20000	0.00250	0.00108	N/A	0.00575		
70	0.23000	0.23000	0.00250	0.00112	N/A	0.00636		
71	0.20000	0.20000	0.00250	0.00116	N/A	0.00703		
72	0.20000	0.20000	0.00250	0.00120	N/A	0.00777		
73	0.20000	0.20000	0.00250	0.00124	N/A	0.00859		
74	0.20000	0.20000	0.00250	0.00128	N/A	0.00950		
75	1.00000	1.00000	0.00000	0.00000	N/A	0.01050		

Table A-10
Probability of Separation from Active Service for General Members
Plan E – Male

Age	Service Retirement	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.00000	N/A	N/A	N/A	0.00043	0	0.15000
19	0.00000	N/A	N/A	N/A	0.00046	1	0.08000
20	0.00000	N/A	N/A	N/A	0.00044	2	0.06000
21	0.00000	N/A	N/A	N/A	0.00043	3	0.04500
22	0.00000	N/A	N/A	N/A	0.00040	4	0.03500
23	0.00000	N/A	N/A	N/A	0.00037	5	0.03100
24	0.00000	N/A	N/A	N/A	0.00035	6	0.02700
25	0.00000	N/A	N/A	N/A	0.00034	7	0.02300
26	0.00000	N/A	N/A	N/A	0.00036	8	0.02200
27	0.00000	N/A	N/A	N/A	0.00037	9	0.02100
28	0.00000	N/A	N/A	N/A	0.00040	10	0.02000
29	0.00000	N/A	N/A	N/A	0.00041	11	0.01900
30	0.00000	N/A	N/A	N/A	0.00043	12	0.01800
31	0.00000	N/A	N/A	N/A	0.00046	13	0.01680
32	0.00000	N/A	N/A	N/A	0.00048	14	0.01560
33	0.00000	N/A	N/A	N/A	0.00050	15	0.01440
34	0.00000	N/A	N/A	N/A	0.00053	16	0.01320
35	0.00000	N/A	N/A	N/A	0.00056	17	0.01200
36	0.00000	N/A	N/A	N/A	0.00060	18	0.01160
37	0.00000	N/A	N/A	N/A	0.00064	19	0.01120
38	0.00000	N/A	N/A	N/A	0.00068	20	0.01080
39	0.00000	N/A	N/A	N/A	0.00073	21	0.01040
40	0.00000	N/A	N/A	N/A	0.00079	22	0.01000
41	0.00000	N/A	N/A	N/A	0.00085	23	0.01000
42	0.00000	N/A	N/A	N/A	0.00092	24	0.01000
43	0.00000	N/A	N/A	N/A	0.00100	25	0.01000
44	0.00000	N/A	N/A	N/A	0.00108	26	0.01000
45	0.00000	N/A	N/A	N/A	0.00118	27	0.01000
46	0.00000	N/A	N/A	N/A	0.00128	28	0.01000
47	0.00000	N/A	N/A	N/A	0.00139	29	0.01000
48	0.00000	N/A	N/A	N/A	0.00152	30 & Above	0.01000
49	0.00000	N/A	N/A	N/A	0.00166		
50	0.00000	N/A	N/A	N/A	0.00179		
51	0.00000	N/A	N/A	N/A	0.00194		
52	0.00000	N/A	N/A	N/A	0.00210		
53	0.00000	N/A	N/A	N/A	0.00227		
54	0.00000	N/A	N/A	N/A	0.00244		
55	0.02000	N/A	N/A	N/A	0.00263		
56	0.02000	N/A	N/A	N/A	0.00283		
57	0.02500	N/A	N/A	N/A	0.00306		
58	0.02500	N/A	N/A	N/A	0.00330		
59	0.03000	N/A	N/A	N/A	0.00355		
60	0.04000	N/A	N/A	N/A	0.00383		
61	0.06000	N/A	N/A	N/A	0.00413		
62	0.09000	N/A	N/A	N/A	0.00445		
63	0.09000	N/A	N/A	N/A	0.00481		
64	0.20000	N/A	N/A	N/A	0.00520		
65	0.28000	N/A	N/A	N/A	0.00562		
66	0.19000	N/A	N/A	N/A	0.00607		
67	0.19000	N/A	N/A	N/A	0.00658		
68	0.19000	N/A	N/A	N/A	0.00713		
69	0.19000	N/A	N/A	N/A	0.00775		
70	0.19000	N/A	N/A	N/A	0.00844		
71	0.19000	N/A	N/A	N/A	0.00920		
72	0.19000	N/A	N/A	N/A	0.01004		
73	0.19000	N/A	N/A	N/A	0.01098		
74	0.19000	N/A	N/A	N/A	0.01201		
75	1.00000	N/A	N/A	N/A	0.01315		

Table A-11
Probability of Separation from Active Service for General Members
Plan E – Female

Age	Service Retirement	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.00000	N/A	N/A	N/A	0.00017	0	0.15000
19	0.00000	N/A	N/A	N/A	0.00017	1	0.08000
20	0.00000	N/A	N/A	N/A	0.00017	2	0.06000
21	0.00000	N/A	N/A	N/A	0.00016	3	0.04500
22	0.00000	N/A	N/A	N/A	0.00014	4	0.03500
23	0.00000	N/A	N/A	N/A	0.00013	5	0.03100
24	0.00000	N/A	N/A	N/A	0.00012	6	0.02700
25	0.00000	N/A	N/A	N/A	0.00012	7	0.02300
26	0.00000	N/A	N/A	N/A	0.00013	8	0.02200
27	0.00000	N/A	N/A	N/A	0.00014	9	0.02100
28	0.00000	N/A	N/A	N/A	0.00016	10	0.02000
29	0.00000	N/A	N/A	N/A	0.00017	11	0.01900
30	0.00000	N/A	N/A	N/A	0.00020	12	0.01800
31	0.00000	N/A	N/A	N/A	0.00021	13	0.01680
32	0.00000	N/A	N/A	N/A	0.00023	14	0.01560
33	0.00000	N/A	N/A	N/A	0.00025	15	0.01440
34	0.00000	N/A	N/A	N/A	0.00027	16	0.01320
35	0.00000	N/A	N/A	N/A	0.00030	17	0.01200
36	0.00000	N/A	N/A	N/A	0.00033	18	0.01160
37	0.00000	N/A	N/A	N/A	0.00036	19	0.01120
38	0.00000	N/A	N/A	N/A	0.00039	20	0.01080
39	0.00000	N/A	N/A	N/A	0.00043	21	0.01040
40	0.00000	N/A	N/A	N/A	0.00047	22	0.01000
41	0.00000	N/A	N/A	N/A	0.00052	23	0.01000
42	0.00000	N/A	N/A	N/A	0.00056	24	0.01000
43	0.00000	N/A	N/A	N/A	0.00061	25	0.01000
44	0.00000	N/A	N/A	N/A	0.00066	26	0.01000
45	0.00000	N/A	N/A	N/A	0.00073	27	0.01000
46	0.00000	N/A	N/A	N/A	0.00079	28	0.01000
47	0.00000	N/A	N/A	N/A	0.00086	29	0.01000
48	0.00000	N/A	N/A	N/A	0.00092	30 & Above	0.01000
49	0.00000	N/A	N/A	N/A	0.00100		
50	0.00000	N/A	N/A	N/A	0.00108		
51	0.00000	N/A	N/A	N/A	0.00117		
52	0.00000	N/A	N/A	N/A	0.00126		
53	0.00000	N/A	N/A	N/A	0.00137		
54	0.00000	N/A	N/A	N/A	0.00147		
55	0.02000	N/A	N/A	N/A	0.00160		
56	0.02000	N/A	N/A	N/A	0.00173		
57	0.02500	N/A	N/A	N/A	0.00187		
58	0.02500	N/A	N/A	N/A	0.00203		
59	0.03000	N/A	N/A	N/A	0.00221		
60	0.04000	N/A	N/A	N/A	0.00242		
61	0.06000	N/A	N/A	N/A	0.00264		
62	0.09000	N/A	N/A	N/A	0.00289		
63	0.09000	N/A	N/A	N/A	0.00317		
64	0.20000	N/A	N/A	N/A	0.00350		
65	0.28000	N/A	N/A	N/A	0.00385		
66	0.19000	N/A	N/A	N/A	0.00425		
67	0.19000	N/A	N/A	N/A	0.00471		
68	0.19000	N/A	N/A	N/A	0.00520		
69	0.19000	N/A	N/A	N/A	0.00575		
70	0.19000	N/A	N/A	N/A	0.00636		
71	0.19000	N/A	N/A	N/A	0.00703		
72	0.19000	N/A	N/A	N/A	0.00777		
73	0.19000	N/A	N/A	N/A	0.00859		
74	0.19000	N/A	N/A	N/A	0.00950		
75	1.00000	N/A	N/A	N/A	0.01050		

Table A-12
Probability of Separation from Active Service for Safety Members
Plan A, B & C – Male

Age	Service Retirement Plans A-B	Service Retirement Plan C	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.00000	0.00000	0.00200	0.00000	0.00010	0.00037
19	0.00000	0.00000	0.00200	0.00000	0.00010	0.00040
20	0.00000	0.00000	0.00200	0.00000	0.00010	0.00041
21	0.00000	0.00000	0.00200	0.00000	0.00010	0.00041
22	0.00000	0.00000	0.00200	0.00000	0.00010	0.00040
23	0.00000	0.00000	0.00200	0.00000	0.00010	0.00039
24	0.00000	0.00000	0.00200	0.00000	0.00010	0.00038
25	0.00000	0.00000	0.00200	0.00000	0.00010	0.00037
26	0.00000	0.00000	0.00200	0.00000	0.00010	0.00038
27	0.00000	0.00000	0.00200	0.00000	0.00010	0.00039
28	0.00000	0.00000	0.00200	0.00000	0.00010	0.00040
29	0.00000	0.00000	0.00200	0.00000	0.00010	0.00041
30	0.00000	0.00000	0.00200	0.00000	0.00010	0.00041
31	0.00000	0.00000	0.00200	0.00000	0.00010	0.00042
32	0.00000	0.00000	0.00200	0.00000	0.00010	0.00043
33	0.00000	0.00000	0.00210	0.00000	0.00010	0.00044
34	0.00000	0.00000	0.00220	0.00000	0.00010	0.00045
35	0.00000	0.00000	0.00230	0.00000	0.00010	0.00047
36	0.00000	0.00000	0.00240	0.00000	0.00010	0.00049
37	0.00000	0.00000	0.00250	0.00000	0.00010	0.00050
38	0.00000	0.00000	0.00260	0.00000	0.00010	0.00053
39	0.00000	0.00000	0.00270	0.00000	0.00010	0.00056
40	0.00750	0.00000	0.00280	0.00000	0.00010	0.00059
41	0.00750	0.00000	0.00290	0.00000	0.00010	0.00062
42	0.00750	0.00000	0.00300	0.00000	0.00010	0.00067
43	0.00750	0.00000	0.00310	0.00000	0.00010	0.00071
44	0.00750	0.00000	0.00320	0.00000	0.00010	0.00076
45	0.00750	0.00000	0.00330	0.00000	0.00010	0.00082
46	0.00750	0.00000	0.00340	0.00000	0.00010	0.00088
47	0.00750	0.00000	0.00350	0.00000	0.00010	0.00095
48	0.00750	0.00000	0.00400	0.00000	0.00010	0.00102
49	0.00750	0.00000	0.00500	0.00000	0.00010	0.00111
50	0.02000	0.02000	0.00750	0.00000	0.00010	0.00120
51	0.02000	0.02000	0.00750	0.00000	0.00010	0.00129
52	0.02000	0.02000	0.00750	0.00000	0.00010	0.00140
53	0.03000	0.03000	0.02000	0.00000	0.00010	0.00151
54	0.15000	0.10000	0.02000	0.00000	0.00010	0.00162
55	0.26000	0.15000	0.07500	0.00000	0.00010	0.00175
56	0.17000	0.15000	0.07500	0.00000	0.00010	0.00190
57	0.17000	0.28000	0.10000	0.00000	0.00010	0.00205
58	0.17000	0.17000	0.10000	0.00000	0.00010	0.00223
59	0.27000	0.27000	0.10000	0.00000	0.00010	0.00243
60	0.27000	0.27000	0.10000	0.00000	0.00010	0.00264
61	0.25000	0.25000	0.05000	0.00000	0.00010	0.00288
62	0.25000	0.25000	0.05000	0.00000	0.00010	0.00315
63	0.25000	0.25000	0.05000	0.00000	0.00010	0.00344
64	0.25000	0.25000	0.05000	0.00000	0.00010	0.00375
65	1.00000	1.00000	0.00000	0.00000	0.00000	0.00410

Years of Service	Other Terminations
0	0.03500
1	0.02750
2	0.02000
3	0.01500
4	0.01200
5	0.01130
6	0.01070
7	0.01000
8	0.00920
9	0.00840
10	0.00760
11	0.00680
12	0.00600
13	0.00560
14	0.00520
15	0.00480
16	0.00440
17	0.00400
18	0.00360
19	0.00320
20	0.00280
21	0.00240
22	0.00200
23	0.00200
24	0.00200
25	0.00200
26	0.00200
27	0.00200
28	0.00200
29	0.00200
30 & Above	0.00000

Table A-13
Probability of Separation from Active Service for Safety Members
Plan A, B & C – Female

Age	Service Retirement Plans A-B	Service Retirement Plan C	Service Disability	Ordinary Disability	Service Death	Ordinary Death
18	0.00000	0.00000	0.00300	0.00000	0.00010	0.00014
19	0.00000	0.00000	0.00300	0.00000	0.00010	0.00015
20	0.00000	0.00000	0.00300	0.00000	0.00010	0.00016
21	0.00000	0.00000	0.00300	0.00000	0.00010	0.00017
22	0.00000	0.00000	0.00300	0.00000	0.00010	0.00017
23	0.00000	0.00000	0.00300	0.00000	0.00010	0.00018
24	0.00000	0.00000	0.00300	0.00000	0.00010	0.00019
25	0.00000	0.00000	0.00300	0.00000	0.00010	0.00020
26	0.00000	0.00000	0.00300	0.00000	0.00010	0.00021
27	0.00000	0.00000	0.00300	0.00000	0.00010	0.00022
28	0.00000	0.00000	0.00340	0.00000	0.00010	0.00024
29	0.00000	0.00000	0.00380	0.00000	0.00010	0.00025
30	0.00000	0.00000	0.00420	0.00000	0.00010	0.00027
31	0.00000	0.00000	0.00460	0.00000	0.00010	0.00028
32	0.00000	0.00000	0.00500	0.00000	0.00010	0.00030
33	0.00000	0.00000	0.00560	0.00000	0.00010	0.00032
34	0.00000	0.00000	0.00620	0.00000	0.00010	0.00034
35	0.00000	0.00000	0.00680	0.00000	0.00010	0.00036
36	0.00000	0.00000	0.00740	0.00000	0.00010	0.00038
37	0.00000	0.00000	0.00800	0.00000	0.00010	0.00041
38	0.00000	0.00000	0.00840	0.00000	0.00010	0.00043
39	0.00000	0.00000	0.00880	0.00000	0.00010	0.00046
40	0.00750	0.00000	0.00920	0.00000	0.00010	0.00049
41	0.00750	0.00000	0.00960	0.00000	0.00010	0.00052
42	0.00750	0.00000	0.01000	0.00000	0.00010	0.00056
43	0.00750	0.00000	0.01040	0.00000	0.00010	0.00059
44	0.00750	0.00000	0.01080	0.00000	0.00010	0.00063
45	0.00750	0.00000	0.01120	0.00000	0.00010	0.00067
46	0.00750	0.00000	0.01160	0.00000	0.00010	0.00071
47	0.00750	0.00000	0.01200	0.00000	0.00010	0.00076
48	0.00750	0.00000	0.01300	0.00000	0.00010	0.00080
49	0.00750	0.00000	0.01500	0.00000	0.00010	0.00085
50	0.02000	0.02000	0.01800	0.00000	0.00010	0.00091
51	0.02000	0.02000	0.02000	0.00000	0.00010	0.00097
52	0.02000	0.02000	0.02400	0.00000	0.00010	0.00103
53	0.03000	0.03000	0.02800	0.00000	0.00010	0.00109
54	0.15000	0.10000	0.03200	0.00000	0.00010	0.00116
55	0.26000	0.15000	0.11000	0.00000	0.00010	0.00123
56	0.17000	0.15000	0.06000	0.00000	0.00010	0.00131
57	0.17000	0.28000	0.06000	0.00000	0.00010	0.00140
58	0.17000	0.17000	0.06000	0.00000	0.00010	0.00148
59	0.27000	0.27000	0.06000	0.00000	0.00010	0.00158
60	0.27000	0.27000	0.06000	0.00000	0.00010	0.00168
61	0.25000	0.25000	0.06000	0.00000	0.00010	0.00178
62	0.25000	0.25000	0.06000	0.00000	0.00010	0.00190
63	0.25000	0.25000	0.06000	0.00000	0.00010	0.00202
64	0.25000	0.25000	0.06000	0.00000	0.00010	0.00215
65	1.00000	1.00000	0.00000	0.00000	0.00000	0.00228

Years of Service	Other Terminations
0	0.03500
1	0.02750
2	0.02000
3	0.01500
4	0.01200
5	0.01130
6	0.01070
7	0.01000
8	0.00920
9	0.00840
10	0.00760
11	0.00680
12	0.00600
13	0.00560
14	0.00520
15	0.00480
16	0.00440
17	0.00400
18	0.00360
19	0.00320
20	0.00280
21	0.00240
22	0.00200
23	0.00200
24	0.00200
25	0.00200
26	0.00200
27	0.00200
28	0.00200
29	0.00200
30 & Above	0.00000

Appendix B Summary of Plan Provisions

All actuarial calculations are based on our understanding of the statutes governing LACERA as contained in the County Employees Retirement Law (CERL) of 1937 and the California Public Employees' Pension Reform Act of 2013 (PEPRA). The benefit and contribution provisions of this law are summarized briefly below, along with corresponding references to the Government Code Section. This summary does not attempt to cover all the detailed provisions of the law.

MEMBERSHIP	**Government Code Section**
Permanent employees of Los Angeles County (County) and participating districts who work ¾ time or more are eligible for membership in LACERA.	(31551, 31552, Bylaws)
Employees eligible for safety membership (law enforcement, firefighting and specific lifeguards) become safety members on the first day of the month after date of hire. Employees who become members on or after January 1, 2013, will enter into Safety Plan C.	(31558)
All other employees become general members on the first day of the month after date of hire or the first day of the month after they make an election of either Plan D or Plan E, depending on the law in effect at that time. Employees who become members on or after January 1, 2013 will enter into General Plan G.	(31493, 31493.5, 31493.6, Bylaws)
Elective officers become members on the first day of the month after filing a declaration with the Board of Retirement (Board).	(31553, 31562)
General members in Plan E may transfer all their Plan E service credit to Plan D during an approved transfer period by making the required contributions. Transferred members relinquish, waive, and forfeit any and all vested or accrued benefits available under any other retirement plan and are entitled only to the benefits of Plan D.	(31494.1, 31494.3)

RETIREMENT PLANS

The County has established nine defined benefit plans. The following outlines the dates these plans were available, based on a member's date of entry into LACERA:

Safety Member Plans:

Plan A: Inception to August 1977
Plan B: September 1977 through December 2012
Plan C: January 2013 to present (7522.02)

General Member Plans:

Plan A: Inception through August 1977
Plan B: September 1977 through September 1978
Plan C: October 1978 through May 1979
Plan D: June 1979 through December 2012
Plan E: February 1982 through December 2012 (31487, 31496)
Plan G: January 2013 to present (7522.02)

NOTE: After review of a new member's account, a member with prior membership may be enrolled into one of the pre-PEPRA plans.

MEMBER CONTRIBUTIONS

Plans A, B, D and General Plan C members

Contributions are based on the entry age and class of each member and are required of all members in Plans A, B, C, and D. Current member rates are shown in Appendix D. Section 5 provides additional detail on how these rates are calculated. (31620)

Contributions cease when general members are credited with 30 years of service in a contributory plan, provided they were members of LACERA or a reciprocal plan on March 7, 1973, and continuously thereafter. All safety members are eligible for the 30-year cessation of contributions. (31625.2, 31836.1)

Interest is credited to contributions semiannually on June 30 and December 31 at an interest rate set by the Board of Investments on amounts that have been on deposit for at least six months. (31591, 31700)

In addition to the normal contributions, members pay one-half of the cost of their plan's COLA. This is discussed further in Section 5 of this report. (31873)

General Plan G and Safety Plan C members

Members contribute 50% of the aggregate Normal Cost rate for their Plan. (7522.30)

EMPLOYER CONTRIBUTIONS

The employer (County or District) contributes to the retirement fund a percent of the total compensation provided for all members based on an actuarial valuation and recommendation of the actuary and the Board of Investments. (31453, 31454 31581)

SERVICE RETIREMENT ALLOWANCE

Eligibility

Plans A-B: **Safety members** (31662.4, 31662.6, 31663.25)

Age 50 with 10 years of County service;
Any age with 20 years of service; or

Plans A-D: **General members** (31672)

Age 50 with 10 years of County service;
Any age with 30 years of service; or
Age 70 and actively employed, regardless of service.

Plan C: **Safety members** (7522.25(d))

Age 50 with 5 years of service.

Plan E: **General members** (31491, 31491.3)

Age 65 with 10 years of service.
A reduced benefit is also payable at age 55 with 10 years of service.

Plan G: **General members** (7522.20(a))

Age 52 with 5 years of service.

Final Compensation

General Plans A-D and Safety Plans A-B (31462.3)

Average of the member's highest monthly pensionable earnings during any 12-consecutive-month period.

Plan E: Average of the member's highest monthly pensionable earnings during any three 12-consecutive month periods. (31488)

General Plan G and Safety Plan C

Average of the member's highest monthly pensionable earnings during any 36-consecutive month period. (7522.32)

The amount of compensation that is taken into account in computing benefits payable to any person who first becomes a member on or after July 1, 1996, shall not exceed the dollar limitations in Section 401(a)(17) of Title 26 of the US Code. (31671)

The amount of compensation taken into account for General Plan G and Safety Plan C members is limited to $149,016 for 2019. The amount of compensation taken into account shall be adjusted based on changes in the Consumer Price Index for All Urban Consumers: U.S. City Average. Adjustments shall be effective annually on January 1. (7522.10)

SERVICE RETIREMENT ALLOWANCE (continued)

Monthly Allowance

Plans A-B:	**Safety members** 1/50 x Final Compensation x Safety age factor x Years of service. (The Safety Plan A and Safety Plan B age factors are the same.)	(31664)
Plans A-D:	**General members** 1/60 x Final Compensation x a Plan specific age factor x years of service. (The General Plan C and General D age factors are the same.)	(31676.1) (31676.11) (31676.14) (7522.25(d))
Plan C:	**Safety members** Final Compensation x Safety Plan percentage x Years of service.	
Plan E:	**General members [(a)+(b)-(c)] x d where:** (a) 2% x Final Compensation x (Years of Service (up to 35 years), plus (b) 1 % x Final Compensation x Years of Service in excess of 35 (up to 10) (c) Estimated Primary Insurance Amount (PIA) x Years of Covered Service (up to 35) divided by 35. (d) Early Retirement Adjustment Factor The PIA is calculated based on certain assumptions specified by statute, and an assumed Social Security retirement age of 62. If retirement occurs prior to age 65, benefit amount is adjusted by an Early Retirement Adjustment Factor.	(31491, 31491.3 (b)&(c))
Plan G:	**General members** Final Compensation x General Plan percentage x Years of Service.	(7522.20(a))

Social Security Integration

Plans A-C:	**General Members** For County service covered by Social Security prior to January 1, 1983, the 1/60 factor is replaced by 1/90 for the first $350 of compensation.	(31808)
Plan D:	The 1/90 factor is applied to the first $1,050 of compensation.	

SERVICE RETIREMENT ALLOWANCE (continued)

Sample Plan Age Factors

Plan	**Age 50**	**Age 55**	**Age 60**	**Age 65 & Up**	
General A	0.8850	1.1686	1.4638	1.5668	(31676.14)
General B	0.7454	1.0000	1.3093	1.5668	(31676.11)
General C&D	0.7091	0.8954	1.1500	1.4593	(31676.1)
General E	N/A	0.3748	0.6009	1.0000	(31491.3(a))
Safety A&B	1.0000	1.3099	1.3099	1.3099	(31664)

Sample Plan Age Percentages

Plan	**Age 50**	**Age 55**	**Age 60**	**Age 65 & Up**	
General G	N/A	1.30%	1.80%	2.30%*	(7522.20(a))
Safety C	2.00%	2.50%	2.70%	2.70%	(7522.25(d))

**Maximum percentage for General Plan G is 2.50% at age 67.*

Maximum Allowance

Plans A-D, G: Allowance may not exceed 100% of final compensation. (31676.1, 31676.11, 31676.14)

Plan E: The sum of the normal retirement allowance and the estimated PIA cannot exceed 70% of Final Compensation for a member with 35 or less years of service, and cannot exceed 80% of Final Compensation if service exceeds 35 years. (31491)

Unmodified Retirement Allowance (Normal Form)

Plans A-D, G: Life Annuity payable to retired member with 65% continuance to an eligible survivor (or eligible children). (31760.12, 31785.4)

Plan E: Life Annuity payable to retired member with 55% continuance to an eligible survivor (or eligible children). (31492.1)

Eligible survivor includes certain domestic partners. (31780.2)

SERVICE RETIREMENT ALLOWANCE (continued)

Optional Retirement Allowance

A member may elect to have the actuarial equivalent of the service or disability retirement allowance applied to a lesser retirement allowance during the retired member's life in order to provide an optional survivor allowance.		(31760)
Unmodified Plus:	Members with eligible survivors may elect a higher percent than the standard unmodified continuance, up to 100%. The benefit is actuarially reduced from the unmodified amount. The elected percent of the member's reduced allowance is payable to the eligible survivor.	(31760.5)
Option 1:	Member's allowance is reduced to pay a cash refund of any unpaid annuity payments (up to the amount of the member's contributions at retirement) to the member's estate or to a beneficiary having an insurable interest in the life of the member.	(31761)
Option 2:	100% of member's reduced allowance is payable to a beneficiary having an insurable interest in the life of the member.	(31762)
Option 3:	50% of member's reduced allowance is payable to a beneficiary having an insurable interest in the life of the member.	(31763)
Option 4:	Other % of member's reduced allowance is payable to a beneficiary(ies) having an insurable interest in the life of the member.	(31764)
A member may not revoke and name another beneficiary if the member elects Option 2, 3, or 4.		(31782)
Pension Advance Option:	The Pension Advance Option is available to members who are fully insured under Social Security for the purpose of coordinating a member's retirement allowance with benefits receivable from Social Security. It is not available to disability retirees or members who elect Option 2, 3, or 4. The allowance is increased prior to age 62 and then reduced after 62 by amounts which have equivalent actuarial values. The automatic 65% continuance for eligible spouses of members who elect the Pension Advance Option is based on the unmodified allowance the member would have received if the member had not elected the option.	(31810, 31811)

All Allowances (31452.7, 31600)

All allowances are made on a pro-rata basis (based on the number of days in that month) if not in effect for the entire month of retirement. For deaths that occur mid-month, the full month's payment is made.

SERVICE-CONNECTED DISABILITY RETIREMENT ALLOWANCE

Eligibility

Plans A-D, G:	Any age or years of service; disability must result from occupational injury or disease, and member must be permanently incapacitated for the performance of duty.	(31720)
Plan E:	Not available under Plan E.	(31487)

Monthly Allowance

Greater of (1) 50% of final compensation, and (2) the service retirement allowance, if eligible to retire. (31727.4)

Normal Form Of Payment

Life Annuity with 100% continuance to a surviving spouse (or eligible children). (31786)

NONSERVICE-CONNECTED DISABILITY RETIREMENT ALLOWANCE

Eligibility

Plans A-D, G:	Any age with five years of service, and permanently incapacitated for the performance of duty.	(31720)
Plan E:	Not available under Plan E.	(31487)

Monthly Allowance

The monthly allowance is equal to a service retirement allowance if a General member is age 65 or a Safety member is age 55; otherwise the monthly allowance is the greater of that to which the member would be entitled as service retirement or the sum of (a) or (b) where: (31726, 31726.5)

General Members:	(a) 90% of 1/60 of Final Compensation x years of service, if member must rely on service in another retirement plan in order to be eligible to retire, or allowance exceeds 1/3 of final compensation.	(31727(a))
	(b) 90% of 1/60 of Final Compensation x years of service projected to age 65, not to exceed 1/3 of Final Compensation.	(31727(b))
Safety Members:	1/60 is replaced by 1/50 and age 65 is replaced by age 55 in (a) and (b) above.	(31727.2)

Normal Form of Payment

Life Annuity with 65% continuance to a surviving spouse (or eligible children). (31760.1, 31760.12, 31785, 31785.4)

SERVICE-CONNECTED PRE-RETIREMENT DEATH BENEFITS

Eligibility

(31787)

Plans A-D, G:	Active members who die in service as a result of injury or disease arising out of and in the course of employment.	
Plan E:	Not available under Plan E.	(31487)

Monthly Allowance

(31787)

A monthly allowance payable to an eligible survivor (or eligible children) equal to the retirement allowance the deceased member would have received under a service-connected disability retirement.

Optional Combined Benefit

(31781.3)

In lieu of the monthly allowance above, a surviving spouse may elect:

(a) A lump sum equal to 1/12 of the compensation earned in the preceding 12 months x years of service (benefit not to exceed 50% of the 12 months' compensation), plus

(b) A monthly payment equal to 50% of the member's Final Compensation, reduced by a monthly amount, which is the actuarial equivalent of (a) above based on the age of surviving spouse.

Death Benefit (Lump Sum)

(31781)

The member's accumulated contributions with interest, plus 1/12 of the compensation earned in the preceding 12 months x years of service (benefit not to exceed 50% of the 12 months' compensation).

Additional Allowance for Children

(31787.5)

25% of death allowance (whether or not the monthly allowance or combined benefit is chosen) for one child, 40% for two children, and 50% for three or more children.

Additional Amount for Spouse of Safety Member

(31787.6)

A surviving spouse of a safety member is also entitled to receive a lump-sum death benefit equal to 12 x monthly rate of compensation at the time of member's death in addition to all other benefits.

Note: For valuation purposes, an unmarried member is assumed to take the lump sum benefit. A married member is assumed to take the monthly allowance or the lump sum, whichever is more valuable.

NONSERVICE-CONNECTED PRE-RETIREMENT DEATH BENEFITS

Eligibility (31780)

Plans A-D, G:	Active members who die while in service or while physically or mentally incapacitated for the performance of duty.	
Plan E:	Not available under Plan E.	(31487)

Death Benefit (Lump Sum) (31781)

The member's accumulated contributions with interest, plus 1/12 of the compensation earned in preceding 12 months x the number of completed years of service (benefit not to exceed 50% of the 12 months' compensation).

Optional Death Benefit

In lieu of the lump-sum death benefit, the following several optional death benefits are available to provide flexibility to survivors.

First Optional Death Benefit (31781.1, 31781.12)

If a member who would have been entitled to a non-service-connected disability retirement allowance dies prior to retirement as a result of such disability, the surviving spouse (or eligible children) may elect to receive an optional death allowance equal to 65% of the monthly retirement allowance to which the member would have been entitled as of the date of death.

Second Optional Death Benefit (31781.2, 31765.2)

If a member dies prior to reaching the minimum retirement age but has 10 or more years of County service, a surviving spouse (or eligible children) may elect to leave the amount of the death benefit on deposit until the earliest date the member could have retired and at that time receive the allowance provided for in Section 31765 (an Option 3 benefit) or 31765.2 (a 65% continuance).

Third Optional Death Benefit

A surviving spouse of a member who dies after five years of County service may elect a combined benefit equal to:

(a) A lump sum equal to 1/12 of the compensation earnable in the preceding 12 months x the number of completed years of service (benefit not to exceed 50% of the 12 months' compensation), plus (31781.3)

(b) A monthly payment equal to 65% of the monthly retirement allowance to which the member would have been entitled if the member retired or could have retired for a non-service-connected disability as of the date of death, reduced by a monthly amount which is the actuarial equivalent of (a) above based on the age of surviving spouse. (31781.1, 31781.12)

Fourth Optional Death Benefit

If a member dies while eligible for a service retirement and the surviving spouse is designated as beneficiary, the spouse (or eligible children) may elect to receive 65% of the monthly retirement allowance to which the member would have been entitled as of the date of death. (31765.1, 31765.2)

Fifth Optional Death Benefit

If a member dies while eligible for a service retirement and the surviving spouse is designated as beneficiary and survives the member by not less than 30 days, the spouse (or eligible children) may elect to receive the same retirement allowance as the spouse would have received had the member retired on the date of death and selected Option 3. (31765)

Note: For valuation purposes, an unmarried member is assumed to take the lump sum benefit. A married member is assumed to take the first optional death benefit or the lump sum, whichever is more valuable.

POSTRETIREMENT DEATH/BURIAL BENEFIT

Plans A-E:	A one-time lump-sum benefit of $5,000 is payable to the estate or to the beneficiary designated by the member upon the death of any member while receiving a retirement allowance. This is in addition to any other death or survivor benefits. The amount is currently paid by the County based on agreement with LACERA. It is not included for valuation purposes.	(31789.3)

DEFERRED RETIREMENT ALLOWANCE

Eligibility

Plans A, B, D and General Plan C:

	Five years of county or reciprocal service. Member contributions must be left on deposit.	(31700)
Safety Plan C:	Age 50 with 5 years of service.	(7522.25(d))
Plan E:	Age 55 with 10 years of service.	(31491)
Plan G:	Age 52 with 5 years of service.	(7522.20(a))

DEFERRED RETIREMENT ALLOWANCE (continued)

Monthly Allowance

Plans A-D, G:	Same as service retirement allowance; payable any time after the member would have been eligible for service retirement.	(31703, 31704, 31705)
	If a former member dies before the effective date of the deferred retirement allowance, the member's accumulated contributions are paid to the estate or to the named beneficiary.	(31702)
Plan E:	Same as service retirement allowance at normal retirement age 65 or in an actuarially equivalent reduced amount at early retirement, after age 55.	(31491)

TRANSFERS BETWEEN PLAN D AND PLAN E

Members in Plan D may transfer to Plan E on a prospective basis. Members in Plan E may transfer to Plan D on a prospective basis. (31494.2, 31494.5)

RECIPROCITY

All Plans:	Reciprocal benefits are may be granted to members who are entitled to retirement benefits from two or more retirement plans established under the CERL or from a County retirement plan and the California Public Employees' Retirement System (CalPERS). Reciprocity also applies to the members of the State Teachers' Retirement System Defined Benefit Plan.	(31830, 31840.4, 31840.8)
	Final Compensation may be based on service with CalPERS or another County retirement plan, if greater.	(31835)
	Vested former members are eligible for disability and death benefits from LACERA, if disabled while a member of CalPERS or another County retirement plan, but combined benefits are limited.	(31837, 31838, 31838.5, 31839)

TRANSFER FROM CALPERS

Whenever firefighting or law enforcement functions performed by a public agency or the state subject to the California Public Employees Retirement Law are transferred to the County, fire authority, or district, employees performing those functions become members of LACERA. LACERA and CalPERS may enter into an agreement whereby the members' service credit plus the members' and the cities' or states' retirement contributions are transferred from CalPERS to LACERA. (31657)

COST-OF-LIVING INCREASES

Cost-of-living increases (or decreases) are applied to all retirement allowances (service and disability), optional death allowances, and annual death allowances effective April 1, based on changes in the Consumer Price Index (CPI) from the previous January 1 to the current January 1, to the nearest ½ of 1%. (31870, 31870.1)

Plan A:	Members (and their beneficiaries) are limited to a maximum 3% cost-of-living increase.	(31870.1)
Plans B-D, G:	Members (and their beneficiaries) are limited to a maximum 2% cost-of-living increase. When the CPI exceeds 2% or 3%, the difference between the actual CPI and the maximum cost-of-living increase given in any year is credited to the COLA Accumulation. It may be used in future years to provide cost-of-living increases when the CPI falls below 2% or 3%, depending on the retirement plan.	(31870)
Plan E:	Members (and their beneficiaries) are limited to a maximum 2% cost-of-living increase. The 2% is pro-rated based on service earned after June 4, 2002. "Elective COLA" increases for service earned prior to June 4, 2002 may be purchased by the member.	(31495.5)

STAR PROGRAM

Contributory plan members who have a COLA Accumulation of more than 20% resulting from CPI increases that exceeded the maximum cost-of-living increases that could be granted are eligible for a supplemental cost-of-living increase effective January 1 known as the Supplemental Targeted Adjustment for Retirees Cost-of-Living Adjustment (STAR COLA). These benefits are not evaluated in this report, or as part of the actuarially required funding amount, unless they have been vested by the Board of Retirement. (31874.3(b))

Appendix C Valuation Data and Schedules

On the following table, Exhibit C-1, we present a summary of LACERA membership at June 30, 2019 for active members. Similar information is shown in Exhibit C-2 Retired for retired members and C-2 Former for vested former members.

Note that salary amounts shown are the prior year annual pensionable earnings for those members of plans with a one-year final compensation period. For plans with a three-year final compensation period, the monthly rate of pay at June 2019 is shown.

Additional statistical data on both active and retired members is shown in the following tables. Additional detailed summaries are supplied to LACERA staff in a supplementary report.

Exhibit C-3: Age Distribution of Active Members

Exhibit C-4: Age, Service, Compensation Distribution of Active Members

Exhibit C-5: Age, Retirement Year, Benefit Amount and Plan Distribution of Retired Members

Exhibits C-4 and C-5 are shown for all plans combined as well as for each plan separately.

Data on LACERA membership as of June 30, 2019 was supplied to us by LACERA staff. Based on our review of this data and discussions with LACERA staff, all retiree and beneficiary records were included in our valuation.

All records for active and former members supplied by LACERA were included in the valuation.

Exhibit C-1
LACERA Membership – Active Members as of June 30, 2019

	Sex	Vested	NonVested	Total Number	Annual Salary	Average Age	Average Monthly Salary	Average Service
General Members								
Plan A	M	35	-	35	$ 4,665,924	72.7	$ 11,109	40.6
	F	70	-	70	6,025,260	69.4	7,173	38.8
Plan B	M	9	-	9	944,400	68.8	8,744	35.3
	F	25	-	25	2,848,608	64.2	9,495	37.5
Plan C	M	9	-	9	748,368	64.3	6,929	37.7
	F	33	-	33	3,193,512	65.4	8,064	38.9
Plan D	M	13,448	118	13,566	1,280,978,172	50.5	7,869	18.2
	F	27,956	210	28,166	2,421,096,708	50.1	7,163	18.4
Plan E	M	5,140	376	5,516	486,231,336	54.8	7,346	21.8
	F	11,222	593	11,815	862,925,232	54.7	6,086	22.8
Plan G	M	1,633	7,520	9,153	624,942,852	38.2	5,690	3.0
	F	2,972	15,023	17,995	1,120,990,752	37.5	5,191	2.9
Total		62,552	23,840	86,392	$ 6,815,591,124	47.3	$ 6,574	14.4
Safety Members								
Plan A	M	5	-	5	$ 717,780	64.0	$ 11,963	37.2
	F	-	-	-	-	N/A	N/A	N/A
Plan B	M	8,233	76	8,309	1,086,584,160	45.8	10,898	19.2
	F	1,400	16	1,416	174,607,944	43.5	10,276	17.0
Plan C	M	353	2,295	2,648	239,858,532	31.0	7,548	2.8
	F	80	336	416	38,418,624	30.4	7,696	2.9
Total		10,071	2,723	12,794	$ 1,540,187,040	42.0	$ 10,032	15.1
Grand Total		72,623	26,563	99,186	$ 8,355,778,164	46.6	$ 7,020	14.5

Exhibit C-2
Retired LACERA Membership – Retired Members as of June 30, 2019

	Sex	Number	Annual Allowance	Average Age	Average Monthly Benefit
General Members					
Plan A	M	7,707	$ 528,165,018	79.7	$ 5,711
	F	13,461	656,643,406	79.5	4,065
Plan B	M	223	14,491,701	74.2	5,415
	F	521	26,687,269	74.2	4,269
Plan C	M	150	8,270,582	73.0	4,595
	F	345	14,845,155	74.0	3,586
Plan D	M	5,971	259,950,065	68.5	3,628
	F	10,981	416,606,859	68.5	3,162
Plan E	M	4,600	143,436,120	72.2	2,598
	F	9,573	246,512,032	71.8	2,146
Plan G	M	13	217,064	68.1	1,391
	F	15	169,505	64.8	942
Total		53,560	$ 2,315,994,776	73.9	$ 3,603
Safety Members					
Plan A	M	4,790	$ 488,796,695	76.1	$ 8,504
	F	2,020	141,362,102	78.0	5,832
Plan B	M	5,008	476,409,784	60.2	7,927
	F	1,122	76,725,758	57.3	5,699
Plan C	M	5	552,393	56.2	9,207
	F	2	68,851	37.5	2,869
Total		12,947	$ 1,183,915,583	68.6	$ 7,620
Grand Total		66,507	$ 3,499,910,359	72.9	$ 4,385

Exhibit C-2 Former
LACERA Membership – Vested Former Members as of June 30, 2019[1]
Subtotaled by Plan and Retirement Type

	Sex	Number	Average Age
General Members			
Plan A	M	24	72.3
	F	44	71.3
Plan B	M	3	71.3
	F	12	68.2
Plan C	M	5	66.0
	F	13	64.8
Plan D	M	2,586	48.7
	F	5,326	47.9
Plan E	M	1,059	56.8
	F	2,301	56.7
Plan G	M	978	37.3
	F	2,222	36.8
Total		14,573	47.8
Safety Members			
Plan A	M	4	67.0
	F	-	-
Plan B	M	687	43.7
	F	131	43.7
Plan C	M	151	31.4
	F	21	31.2
Total		994	41.6
Grand Total		15,567	47.4

1. *Includes non-vested former members who still have member contributions with LACERA.*

Exhibit C-2a
LACERA Membership – Retired Members as of June 30, 2019
Subtotaled by Plan and Retirement Type

Plan	Retirement Type	Number		Annual Benefits in Thousands		Average Monthly Benefit
General Plans:						
Plan A						
	Healthy	15,190	$	965,291	$	5,296
	Disabled	1,509		61,160		3,378
	Beneficiaries	4,469		158,357		2,953
	Total	21,168	$	1,184,808	$	4,664
Plan B						
	Healthy	618	$	36,876	$	4,972
	Disabled	58		2,107		3,027
	Beneficiaries	68		2,196		2,691
	Total	744	$	41,179	$	4,612
Plan C						
	Healthy	377	$	19,844	$	4,386
	Disabled	51		1,714		2,800
	Beneficiaries	67		1,558		1,938
	Total	495	$	23,116	$	3,892
Plan D						
	Healthy	13,458	$	574,354	$	3,556
	Disabled	2,054		70,264		2,851
	Beneficiaries	1,440		31,940		1,848
	Total	16,952	$	676,558	$	3,326
Plan E						
	Healthy	12,996	$	373,101	$	2,392
	Disabled	N/A		N/A		N/A
	Beneficiaries	1,177		16,847		1,193
	Total	14,173	$	389,948	$	2,293
Plan G						
	Healthy	25	$	323	$	1,077
	Disabled	1		49		4,056
	Beneficiaries	2		15		619
	Total	28	$	387	$	1,151
Safety Plans:						
Plan A						
	Healthy	2,224	$	237,911	$	8,915
	Disabled	2,999		286,460		7,960
	Beneficiaries	1,587		105,788		5,555
	Total	6,810	$	630,159	$	7,711
Plan B						
	Healthy	2,625	$	263,301	$	8,359
	Disabled	3,216		273,258		7,081
	Beneficiaries	289		16,576		4,780
	Total	6,130	$	553,135	$	7,520
Plan C						
	Healthy	4	$	518	$	10,798
	Disabled	3		103		2,859
	Beneficiaries	0		0		N/A
	Total	7	$	621	$	7,396
Grand Totals		66,507		3,499,910		4,385

Exhibit C-2b
LACERA Membership – Retired Members as of June 30, 2019
Subtotaled by Retirement Type and Plan

Type	Plan	Number		Annual Benefits in Thousands		Average Monthly Benefit
Healthy Retirees						
	General A	15,190	$	965,291	$	5,296
	General B	618		36,876		4,972
	General C	377		19,844		4,386
	General D	13,458		574,354		3,556
	General E	12,996		373,101		2,392
	General G	25		323		1,077
	Safety A	2,224		237,911		8,915
	Safety B	2,625		263,301		8,359
	Safety C	4		518		10,798
	Total	47,517	$	2,471,519	$	4,334
Disabled Retirees						
	General A	1,509	$	61,160	$	3,378
	General B	58		2,107		3,027
	General C	51		1,714		2,800
	General D	2,054		70,264		2,851
	General E	N/A		N/A		N/A
	General G	1		49		4,056
	Safety A	2,999		286,460		7,960
	Safety B	3,216		273,258		7,081
	Safety C	3		103		2,859
	Total	9,891	$	695,115	$	5,856
Beneficiaries						
	General A	4,469	$	158,357	$	2,953
	General B	68		2,196		2,691
	General C	67		1,558		1,938
	General D	1,440		31,940		1,848
	General E	1,177		16,847		1,193
	General G	2		15		619
	Safety A	1,587		105,788		5,555
	Safety B	289		16,576		4,780
	Safety C	0		0		N/A
	Total	9,099	$	333,277	$	3,052
Grand Totals		66,507	$	3,499,910	$	4,385

Exhibit C-3
Age Distribution of Active Members as of June 30, 2019

	Age Groups						
	0-29	30-39	40-49	50-59	60-69	70+	Total
General Plans:							
Plan A							
Male	-	-	-	-	11	24	35
Female	-	-	-	-	43	27	70
Plan B							
Male	-	-	-	-	6	3	9
Female	-	-	-	1	21	3	25
Plan C							
Male	-	-	-	-	8	1	9
Female	-	-	-	6	20	7	33
Plan D							
Male	32	1,901	4,351	4,708	2,294	280	13,566
Female	27	4,103	9,413	9,702	4,449	472	28,166
Plan E							
Male	4	423	1,232	1,937	1,599	321	5,516
Female	8	806	2,443	4,654	3,460	444	11,815
Plan G							
Male	1,781	4,038	1,939	1,013	355	27	9,153
Female	3,671	8,323	3,557	1,886	529	29	17,995
Safety Plans:							
Plan A							
Male	-	-	-	-	5	-	5
Female	-	-	-	-	-	-	-
Plan B							
Male	68	1,972	3,176	2,921	168	4	8,309
Female	14	460	603	325	14	-	1,416
Plan C							
Male	1,268	1,162	168	45	5	-	2,648
Female	221	170	20	5	-	-	416
Grand Totals:	7,094	23,358	26,902	27,203	12,987	1,642	99,186

Exhibit C-4
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
All Plans

Count

	Years of Service												
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Total Count
Under 25	507	253	119	50	8	1	-	-	-	-	-	-	938
25-29	1,496	1,415	1,291	915	546	487	6	-	-	-	-	-	6,156
30-34	1,314	1,312	1,488	1,430	1,293	2,748	1,188	19	-	-	-	-	10,792
35-39	770	933	937	983	845	2,694	4,612	744	47	1	-	-	12,566
40-44	501	573	632	536	538	1,746	4,334	3,207	959	73	-	-	13,099
45-49	358	366	395	418	356	1,249	3,073	3,390	3,009	1,095	89	5	13,803
50-54	263	297	298	295	257	860	2,247	2,491	2,703	3,167	1,630	153	14,661
55-59	151	195	195	188	207	749	1,746	1,884	1,774	2,286	2,274	893	12,542
60-64	83	94	82	126	109	480	1,309	1,418	1,213	1,366	1,420	1,411	9,111
65 & Over	26	18	50	30	53	278	897	1,040	945	778	603	800	5,518
Total Count	5,469	5,456	5,487	4,971	4,212	11,292	19,412	14,193	10,650	8,766	6,016	3,262	99,186

Compensation

	Years of Service												
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Average Comp.
Under 25	52,288	58,619	61,217	58,794	71,183	48,792	-	-	-	-	-	-	55,633
25-29	54,702	58,331	62,954	64,867	65,153	73,287	84,284	-	-	-	-	-	61,204
30-34	60,549	62,253	66,036	65,872	70,360	77,352	81,644	89,538	-	-	-	-	70,045
35-39	64,907	67,421	70,230	69,852	75,033	84,917	87,228	90,048	89,516	87,060	-	-	80,623
40-44	65,059	65,333	68,779	73,829	73,745	88,473	86,835	90,747	97,627	115,481	-	-	85,246
45-49	64,024	66,818	69,602	70,911	72,390	84,604	85,644	93,496	102,438	106,980	116,293	100,042	90,728
50-54	60,436	69,594	68,324	68,232	70,537	80,473	82,298	90,476	99,686	107,623	114,780	118,374	94,822
55-59	65,163	63,722	67,632	70,383	71,570	82,411	75,815	82,635	92,512	99,288	107,082	104,531	90,992
60-64	67,142	68,623	70,981	71,557	72,097	81,275	73,750	81,102	86,515	92,529	102,614	96,682	87,668
65 & Over	93,664	71,626	109,371	110,148	82,071	86,388	75,115	77,454	79,045	84,275	91,179	93,310	83,125
Avg. Annual Compensation	$ 59,818	$ 63,174	$ 67,145	$ 68,406	$ 71,491	$ 82,463	$ 83,481	$ 88,303	$ 95,707	$ 101,008	$ 106,655	$ 99,026	$ 84,244

Exhibit C-4a
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
General Plan A

Count

	Years of Service												Total
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Count
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	-	-	-	-
60-64	-	-	-	-	-	-	-	1	1	2	-	7	11
65 & Over	-	-	-	-	-	-	2	6	11	4	3	68	94
Total Count	-	-	-	-	-	-	2	7	12	6	3	75	105

Compensation

	Years of Service												Average
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Comp.
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	-	-	-	-
60-64	-	-	-	-	-	-	-	32,460	92,856	48,132	-	81,835	72,220
65 & Over	-	-	-	-	-	-	97,842	98,520	116,893	71,322	83,848	107,166	105,285
Avg. Annual Compensation	$ -	$ -	$ -	$ -	$ -	$ -	$ 97,842	$ 89,083	$ 114,890	$ 63,592	$ 83,848	$ 104,802	$ 101,821

Exhibit C-4b
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
General Plan B

Count

	Years of Service												Total
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Count
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	-	-	1	1
60-64	-	-	-	-	-	-	-	-	1	-	-	14	15
65 & Over	-	-	-	-	-	-	-	2	1	3	1	11	18
Total Count	-	-	-	-	-	-	-	2	2	3	1	26	34

Compensation

	Years of Service												Average
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Comp.
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	-	-	73,644	73,644
60-64	-	-	-	-	-	-	-	-	57,444	-	-	91,628	89,349
65 & Over	-	-	-	-	-	-	-	133,674	57,444	126,592	129,804	140,433	132,174
Avg. Annual Compensation	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 133,674	$ 57,444	$ 126,592	$ 129,804	$ 111,584	$ 111,559

Exhibit C-4c
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
General Plan C

Count

Age	Years of Service 0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Total Count
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	1	-	-	5	6
60-64	-	-	-	-	-	-	-	-	-	-	2	16	18
65 & Over	-	-	-	-	-	-	-	-	1	-	1	16	18
Total Count	-	-	-	-	-	-	-	-	2	-	3	37	42

Compensation

Age	Years of Service 0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Average Comp.
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	63,096	-	-	85,517	81,780
60-64	-	-	-	-	-	-	-	-	-	-	93,930	80,737	82,203
65 & Over	-	-	-	-	-	-	-	-	132,768	-	199,656	102,446	109,531
Avg. Annual Compensation	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 97,932	$ -	$ 129,172	$ 90,770	$ 93,854

Exhibit C-4d
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
General Plan D

Count

	Years of Service												Total
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Count
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	3	-	-	-	53	3	-	-	-	-	-	59
30-34	3	11	6	9	11	782	575	14	-	-	-	-	1,411
35-39	10	14	20	18	20	1,169	2,857	446	38	1	-	-	4,593
40-44	3	8	15	14	14	836	2,948	1,983	584	54	-	-	6,459
45-49	4	7	16	10	13	569	2,147	2,127	1,723	621	63	5	7,305
50-54	4	11	18	12	7	399	1,591	1,607	1,615	1,517	705	122	7,608
55-59	3	2	4	6	10	301	1,215	1,293	1,143	1,253	1,057	515	6,802
60-64	1	2	6	4	4	198	920	934	796	788	689	496	4,838
65 & Over	-	1	2	2	-	115	587	632	540	383	252	143	2,657
Total Count	28	59	87	75	79	4,422	12,843	9,036	6,439	4,617	2,766	1,281	41,732

Compensation

	Years of Service												Average
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Comp.
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	56,844	-	-	-	56,864	69,268	-	-	-	-	-	57,494
30-34	72,784	86,984	83,888	80,747	76,200	74,485	68,941	81,878	-	-	-	-	72,486
35-39	84,444	69,912	76,130	94,911	100,776	85,567	80,404	83,820	86,626	87,060	-	-	82,206
40-44	133,012	86,558	88,090	87,314	82,296	92,102	83,966	86,654	90,312	107,847	-	-	86,657
45-49	116,403	88,635	104,562	106,945	85,651	89,723	84,136	91,214	94,343	97,791	107,757	100,042	90,516
50-54	197,034	136,916	85,203	97,229	92,319	83,688	82,355	90,377	95,255	97,689	100,134	107,810	92,150
55-59	149,652	94,002	72,246	104,072	77,251	87,231	78,485	84,319	93,563	97,514	105,056	108,548	92,478
60-64	177,924	90,738	84,374	92,421	158,556	84,220	76,018	84,956	92,318	95,102	109,205	105,444	91,732
65 & Over	-	43,392	84,972	58,038	-	86,763	76,837	79,577	79,945	89,043	96,911	115,993	84,300
Avg. Annual Compensation	$ 119,373	$ 90,474	$ 86,426	$ 93,385	$ 90,789	$ 84,948	$ 80,913	$ 87,237	$ 92,564	$ 96,613	$ 104,154	$ 108,074	$ 88,711

Exhibit C-4e
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
General Plan E

Count

	Years of Service												Total
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Count
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	12	-	-	-	-	-	-	12
30-34	-	-	-	-	1	130	191	-	-	-	-	-	322
35-39	-	-	-	-	-	182	614	109	2	-	-	-	907
40-44	-	-	-	-	-	143	690	604	125	3	-	-	1,565
45-49	-	-	-	-	-	131	578	680	527	189	5	-	2,110
50-54	-	-	-	-	-	89	478	580	592	821	430	5	2,995
55-59	-	-	-	-	-	122	480	499	482	791	915	307	3,596
60-64	-	-	-	-	-	94	375	458	389	536	700	843	3,395
65 & Over	-	-	-	-	-	65	301	398	387	380	344	554	2,429
Total Count	-	-	-	-	1	968	3,707	3,328	2,504	2,720	2,394	1,709	17,331

Compensation

	Years of Service												Average
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Comp.
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	58,931	-	-	-	-	-	-	58,931
30-34	-	-	-	-	59,568	67,325	61,160	-	-	-	-	-	63,644
35-39	-	-	-	-	-	73,432	68,461	67,174	50,442	-	-	-	69,264
40-44	-	-	-	-	-	82,652	71,186	70,178	71,211	100,500	-	-	71,903
45-49	-	-	-	-	-	80,067	73,816	73,234	80,829	76,591	97,080	-	76,072
50-54	-	-	-	-	-	80,172	68,454	71,384	82,098	82,690	78,730	83,172	77,469
55-59	-	-	-	-	-	79,901	64,891	69,654	76,811	87,890	89,598	81,072	80,386
60-64	-	-	-	-	-	88,552	66,799	71,303	71,677	84,998	93,488	88,523	82,338
65 & Over	-	-	-	-	-	96,470	70,264	72,806	75,894	78,135	86,289	83,620	78,826
Avg. Annual Compensation	$ -	$ -	$ -	$ -	$ 59,568	$ 79,142	$ 68,942	$ 71,305	$ 77,667	$ 83,617	$ 88,323	$ 85,579	$ 77,846

Exhibit C-4f
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
General Plan G

Count

	Years of Service												Total
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Count
Under 25	355	163	72	34	4	1	-	-	-	-	-	-	629
25-29	1,236	1,156	1,015	708	452	256	-	-	-	-	-	-	4,823
30-34	1,211	1,148	1,276	1,267	1,135	1,282	10	-	-	-	-	-	7,329
35-39	720	858	821	873	759	997	4	-	-	-	-	-	5,032
40-44	478	541	584	493	504	602	9	-	-	-	-	-	3,211
45-49	350	350	368	395	336	478	6	2	-	-	-	-	2,285
50-54	256	279	277	281	243	349	5	-	1	-	-	-	1,691
55-59	146	191	190	179	192	302	6	2	-	-	-	-	1,208
60-64	81	92	76	122	104	183	6	3	-	-	-	-	667
65 & Over	26	17	48	28	53	96	4	1	-	-	-	-	273
Total Count	4,859	4,795	4,727	4,380	3,782	4,546	50	8	1	-	-	-	27,148

Compensation

	Years of Service												Average
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Comp.
Under 25	42,629	47,327	47,804	45,260	48,693	48,792	-	-	-	-	-	-	44,629
25-29	49,769	52,615	55,288	56,243	58,509	58,445	-	-	-	-	-	-	53,843
30-34	59,304	58,713	61,883	62,102	66,480	67,493	64,246	-	-	-	-	-	62,695
35-39	63,781	65,800	67,378	66,558	71,996	76,801	170,592	-	-	-	-	-	69,098
40-44	63,865	63,798	66,769	71,924	72,528	78,983	71,299	-	-	-	-	-	69,834
45-49	63,163	65,322	67,302	69,058	71,319	76,387	91,498	47,076	-	-	-	-	69,205
50-54	57,900	65,667	66,859	66,748	68,631	75,144	123,509	-	34,956	-	-	-	67,401
55-59	63,015	62,329	67,280	67,370	69,978	75,200	119,196	157,188	-	-	-	-	68,810
60-64	64,768	68,142	69,924	70,873	68,699	73,145	88,974	62,416	-	-	-	-	70,056
65 & Over	93,664	73,287	110,387	113,871	82,071	78,169	130,371	249,648	-	-	-	-	90,818
Avg. Annual Compensation	$ 57,363	$ 59,961	$ 63,363	$ 64,734	$ 68,447	$ 73,030	$ 98,071	$ 105,678	$ 34,956	$ -	$ -	$ -	$ 64,312

Exhibit C-4g
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
Safety Plan A

Count

	Years of Service												
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Total Count
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	-	-	-	-
60-64	-	-	-	-	-	-	-	-	1	-	-	3	4
65 & Over	-	-	-	-	-	-	-	-	-	-	-	1	1
Total Count	-	-	-	-	-	-	-	-	1	-	-	4	5

Compensation

	Years of Service												
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Average Comp.
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	-	-	-	-
60-64	-	-	-	-	-	-	-	-	184,968	-	-	131,232	144,666
65 & Over	-	-	-	-	-	-	-	-	-	-	-	139,116	139,116
Avg. Annual Compensation	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 184,968	$ -	$ -	$ 133,203	$ 143,556

Exhibit C-4h
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
Safety Plan B

Count

	Years of Service												
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Total Count
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	2	-	2	75	3	-	-	-	-	-	82
30-34	1	8	6	1	8	360	411	5	-	-	-	-	800
35-39	3	3	6	12	8	268	1,136	189	7	-	-	-	1,632
40-44	3	4	5	6	3	138	685	619	250	16	-	-	1,729
45-49	-	4	1	-	1	58	342	579	759	285	21	-	2,050
50-54	-	3	-	-	1	17	172	303	495	829	495	26	2,341
55-59	-	1	-	-	-	12	45	90	148	242	302	65	905
60-64	-	-	-	-	-	3	8	22	25	40	29	32	159
65 & Over	-	-	-	-	-	1	3	1	5	8	2	7	27
Total Count	7	23	20	19	23	932	2,805	1,808	1,689	1,420	849	130	9,725

Compensation

	Years of Service												
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Average Comp.
Under 25	-	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	103,992	-	92,424	105,836	99,300	-	-	-	-	-	105,225
30-34	77,988	97,107	97,632	86,220	98,754	107,979	109,245	110,986	-	-	-	-	108,305
35-39	108,476	105,976	92,818	104,697	110,069	113,775	114,220	117,936	116,367	-	-	-	114,392
40-44	103,212	115,968	101,407	106,768	123,788	110,096	115,116	123,931	127,923	144,056	-	-	119,919
45-49	-	129,189	115,944	-	102,348	108,568	114,998	125,833	135,816	147,156	146,476	-	130,399
50-54	-	157,868	-	-	96,396	107,699	118,809	127,508	135,310	150,494	166,955	174,714	145,405
55-59	-	189,504	-	-	-	120,839	114,494	128,761	135,728	145,725	167,142	185,442	150,568
60-64	-	-	-	-	-	121,488	127,271	126,260	129,604	144,974	166,907	186,003	150,892
65 & Over	-	-	-	-	-	135,396	136,044	174,636	136,006	138,293	147,432	160,774	145,364
Avg. Annual Compensation	$ 101,865	$ 119,066	$ 98,683	$ 104,379	$ 105,458	$ 110,057	$ 114,135	$ 124,774	$ 134,319	$ 148,714	$ 166,467	$ 182,106	$ 129,686

Exhibit C-4i
Age and Service Distribution of Active Members by Count and Average Compensation as of June 30, 2019
Safety Plan C

Count

	Years of Service												Total
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Count
Under 25	152	90	47	16	4	-	-	-	-	-	-	-	309
25-29	260	256	274	207	92	91	-	-	-	-	-	-	1,180
30-34	99	145	200	153	138	194	1	-	-	-	-	-	930
35-39	37	58	90	80	58	78	1	-	-	-	-	-	402
40-44	17	20	28	23	17	27	2	1	-	-	-	-	135
45-49	4	5	10	13	6	13	-	2	-	-	-	-	53
50-54	3	4	3	2	6	6	1	1	-	-	-	-	26
55-59	2	1	1	3	5	12	-	-	-	-	-	-	24
60-64	1	-	-	-	1	2	-	-	-	-	-	-	4
65 & Over	-	-	-	-	-	1	-	-	-	-	-	-	1
Total Count	575	579	653	497	327	424	5	4	-	-	-	-	3,064

Compensation

	Years of Service												Average
Age	0-1	1-2	2-3	3-4	4-5	5-9	10-14	15-19	20-24	25-29	30-34	35&Over	Comp.
Under 25	74,849	79,071	81,766	87,552	93,672	-	-	-	-	-	-	-	78,032
25-29	78,150	84,159	91,054	94,364	97,203	99,673	-	-	-	-	-	-	88,440
30-34	75,236	86,482	91,045	96,081	100,235	103,940	128,988	-	-	-	-	-	93,573
35-39	78,007	88,816	93,432	94,932	101,063	106,566	108,888	-	-	-	-	-	95,333
40-44	79,927	88,243	94,529	97,863	93,972	107,969	97,740	88,848	-	-	-	-	94,950
45-49	86,922	91,054	93,684	99,481	98,618	101,480	-	94,422	-	-	-	-	96,846
50-54	94,720	92,172	102,304	102,840	117,986	103,996	122,244	103,068	-	-	-	-	104,717
55-59	95,208	143,388	116,244	182,784	121,358	130,121	-	-	-	-	-	-	131,944
60-64	148,716	-	-	-	79,644	131,406	-	-	-	-	-	-	122,793
65 & Over	-	-	-	-	-	127,848	-	-	-	-	-	-	127,848
Avg. Annual Compensation	$ 77,149	$ 84,774	$ 90,990	$ 95,628	$ 99,679	$ 104,616	$ 111,120	$ 95,190	$ -	$ -	$ -	$ -	$ 90,822

Exhibit C-5
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
All Plans

	Retirement Year											
Age	Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Average Monthly Benefit
Under 35	-	-	-	-	-	1	1	12	13	113	140	$ 880
35-39	-	-	-	-	-	-	3	7	21	69	100	2,611
40-44	-	-	-	-	-	1	3	23	72	112	211	2,985
45-49	-	-	-	-	1	6	58	67	103	152	387	3,209
50-54	-	-	-	1	24	85	126	118	198	701	1,253	3,327
55-59	-	-	-	10	74	153	163	166	661	2,515	3,742	5,337
60-64	-	1	19	52	114	136	175	595	2,343	3,277	6,712	4,901
65-69	-	21	69	98	113	180	617	2,314	3,441	5,092	11,945	4,519
70-74	13	118	205	167	205	811	2,619	3,307	4,158	2,415	14,018	4,563
75-79	31	135	185	223	763	1,889	2,705	2,409	1,607	1,257	11,204	4,523
80-84	64	114	165	582	1,369	1,521	1,543	851	560	1,012	7,781	4,052
85-89	91	109	451	746	1,238	842	455	293	261	732	5,218	3,758
90-94	54	213	420	469	506	220	154	153	175	366	2,730	3,459
95-99	46	137	176	182	100	56	55	50	53	90	945	2,991
100 & Over	19	30	22	12	7	8	7	5	8	3	121	2,754
Total Count	318	878	1,712	2,542	4,514	5,909	8,684	10,370	13,674	17,906	**66,507**	
Avg Monthly Benefit	$ 2,290	$ 2,924	$ 3,052	$ 3,484	$ 4,402	$ 4,297	$ 5,000	$ 4,344	$ 4,424	$ 4,472		**$ 4,385**

Exhibit C-5a
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
General Plan A

	Retirement Year											Average
Age	Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Monthly Benefit
Under 35	-	-	-	-	-	-	-	3	2	10	15	$ 430
35-39	-	-	-	-	-	-	1	3	2	1	7	1,932
40-44	-	-	-	-	-	-	-	3	6	-	9	2,258
45-49	-	-	-	-	-	-	-	3	3	5	11	3,062
50-54	-	-	-	1	1	1	3	2	3	6	17	1,931
55-59	-	-	-	-	-	4	2	10	4	15	35	3,049
60-64	-	-	4	6	1	7	11	48	105	121	303	4,476
65-69	-	12	26	23	14	28	227	518	813	258	1,919	5,321
70-74	7	52	70	52	60	456	977	1,420	618	313	4,025	5,532
75-79	16	66	79	87	534	881	1,570	682	235	445	4,595	5,240
80-84	38	71	81	453	874	984	674	183	144	564	4,066	4,509
85-89	48	74	355	515	991	476	157	97	99	478	3,290	3,895
90-94	35	166	324	406	400	112	77	84	109	278	1,991	3,434
95-99	37	117	166	165	64	45	40	35	37	70	776	2,972
100 & Over	17	30	22	12	5	5	5	5	7	1	109	2,895
Total Count	198	588	1,127	1,720	2,944	2,999	3,744	3,096	2,187	2,565	**21,168**	
Avg Monthly Benefit	$ 1,725	$ 2,382	$ 2,477	$ 3,013	$ 4,275	$ 4,386	$ 5,908	$ 6,023	$ 5,955	$ 3,700		**$ 4,664**

Exhibit C-5b
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
General Plan B

Age	Retirement Year Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Average Monthly Benefit
Under 35	-	-	-	-	-	-	-	-	-	-	-	$ -
35-39	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	1	1	2,684
50-54	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	1	1	1	3	1,444
60-64	-	-	-	-	1	1	-	15	17	40	74	5,212
65-69	-	-	-	1	1	1	13	26	87	54	183	6,134
70-74	-	-	2	5	3	12	23	55	60	14	174	4,789
75-79	-	-	1	4	5	12	38	27	18	5	110	4,147
80-84	-	-	1	1	4	19	33	20	8	5	91	3,954
85-89	-	-	-	5	9	24	5	8	2	9	62	2,847
90-94	-	-	3	4	14	6	3	1	-	6	37	1,967
95-99	-	-	-	3	3	-	-	1	-	1	8	2,139
100 & Over	-	-	-	-	-	-	-	-	-	1	1	777
Total Count	-	-	7	23	40	75	115	154	193	137	**744**	
Avg Monthly Benefit	$ -	$ -	$ 1,312	$ 1,362	$ 1,985	$ 2,422	$ 3,589	$ 4,596	$ 6,207	$ 5,924		**$ 4,612**

Exhibit C-5c
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
General Plan C

	Retirement Year											Average
Age	Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Monthly Benefit
Under 35	-	-	-	-	-	-	-	-	-	2	2	$ 4,905
35-39	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	2	-	2	1,446
45-49	-	-	-	-	-	-	-	-	1	-	1	1,591
50-54	-	-	-	-	-	-	-	-	-	1	1	1,259
55-59	-	-	-	-	-	-	1	-	1	2	4	4,284
60-64	-	-	1	2	-	1	-	5	12	32	53	4,534
65-69	-	1	2	3	2	3	10	15	40	36	112	5,463
70-74	-	-	3	2	1	5	16	24	43	15	109	4,546
75-79	-	-	-	3	10	8	14	25	14	4	78	3,082
80-84	-	-	-	8	8	13	22	7	6	5	69	2,645
85-89	-	-	1	3	6	10	7	5	1	4	37	2,128
90-94	-	-	1	2	9	1	1	1	1	7	23	1,737
95-99	-	-	-	1	2	-	-	-	-	1	4	1,092
100 & Over	-	-	-	-	-	-	-	-	-	-	-	-
Total Count	-	1	8	24	38	41	71	82	121	109	**495**	
Avg Monthly Benefit	$ -	$ 1,808	$ 1,477	$ 991	$ 1,316	$ 2,040	$ 2,815	$ 3,351	$ 5,786	$ 5,325		**$ 3,892**

Exhibit C-5d
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
General Plan D

Age	Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Average Monthly Benefit
	Retirement Year											
Under 35	-	-	-	-	-	-	-	3	6	52	61	$ 697
35-39	-	-	-	-	-	-	1	2	7	23	33	1,651
40-44	-	-	-	-	-	1	1	6	29	31	68	1,980
45-49	-	-	-	-	1	3	14	13	39	59	129	2,214
50-54	-	-	-	-	3	5	24	39	86	413	570	2,025
55-59	-	-	-	-	8	34	50	59	424	862	1,437	2,648
60-64	-	-	2	7	23	41	62	351	698	1,688	2,872	3,548
65-69	-	1	3	14	28	50	220	473	1,196	2,242	4,227	3,961
70-74	-	-	2	12	27	140	275	639	1,461	1,060	3,616	3,558
75-79	-	-	2	10	44	132	311	664	623	330	2,116	3,153
80-84	-	-	4	13	46	127	325	307	181	138	1,141	2,597
85-89	-	-	2	9	31	126	126	74	52	67	487	2,287
90-94	-	-	2	4	29	38	20	21	10	31	155	1,897
95-99	-	1	-	5	15	6	3	1	2	5	38	1,489
100 & Over	-	-	-	-	-	1	-	-	-	1	2	1,691
Total Count	-	2	17	74	255	704	1,432	2,652	4,814	7,002	**16,952**	
Avg Monthly Benefit	$ -	$ 5,677	$ 1,638	$ 1,576	$ 1,717	$ 1,991	$ 2,321	$ 2,730	$ 3,459	$ 3,880		**$ 3,326**

Exhibit C-5e
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
General Plan E

Age	Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Average Monthly Benefit
	Retirement Year											
Under 35	-	-	-	-	-	1	-	3	2	15	21	$ 475
35-39	-	-	-	-	-	-	1	2	5	9	17	1,019
40-44	-	-	-	-	-	-	-	1	6	18	25	1,500
45-49	-	-	-	-	-	-	-	2	12	15	29	1,271
50-54	-	-	-	-	-	-	2	7	15	23	47	1,056
55-59	-	-	-	-	-	-	2	3	19	364	388	955
60-64	-	-	-	-	-	-	3	9	515	703	1,230	1,662
65-69	-	-	-	-	-	4	8	604	834	2,306	3,756	2,799
70-74	-	-	-	-	1	6	435	718	1,879	868	3,907	2,607
75-79	-	-	-	-	1	241	349	972	671	314	2,548	2,261
80-84	-	-	-	-	80	177	459	313	187	141	1,357	1,733
85-89	-	-	-	29	71	185	132	78	64	60	619	1,405
90-94	-	-	1	10	47	48	26	20	19	9	180	1,202
95-99	-	-	2	8	13	4	4	3	6	5	45	610
100 & Over	-	-	-	-	2	2	-	-	-	-	4	450
Total Count	-	-	3	47	215	668	1,421	2,735	4,234	4,850	**14,173**	
Avg Monthly Benefit	$ -	$ -	$ 266	$ 314	$ 586	$ 823	$ 1,282	$ 1,686	$ 2,576	$ 2,982		**$ 2,293**

Exhibit C-5f
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
General Plan G

Age	Retirement Year Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Average Monthly Benefit
Under 35	-	-	-	-	-	-	-	-	-	-	-	$ -
35-39	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	-	-	-
45-49	-	-	-	-	-	-	-	-	-	1	1	891
50-54	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	2	2	257
60-64	-	-	-	-	-	-	-	-	-	9	9	778
65-69	-	-	-	-	-	-	-	-	-	8	8	1,240
70-74	-	-	-	-	-	-	-	-	-	5	5	991
75-79	-	-	-	-	-	-	-	-	-	1	1	5,544
80-84	-	-	-	-	-	-	-	-	-	2	2	1,694
85-89	-	-	-	-	-	-	-	-	-	-	-	-
90-94	-	-	-	-	-	-	-	-	-	-	-	-
95-99	-	-	-	-	-	-	-	-	-	-	-	-
100 & Over	-	-	-	-	-	-	-	-	-	-	-	-
Total Count	-	-	-	-	-	-	-	-	-	28	**28**	
Avg Monthly Benefit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,151		**$ 1,151**

Exhibit C-5g
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
Safety Plan A

	Retirement Year											
Age	Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Average Monthly Benefit
Under 35	-	-	-	-	-	-	-	-	2	7	9	$ -
35-39	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	1	1	2	6,472
45-49	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	1	3	-	1	2	7	5,517
55-59	-	-	-	-	2	-	1	-	3	12	18	5,743
60-64	-	1	3	2	2	4	5	10	87	25	139	10,056
65-69	-	7	30	31	29	58	75	399	141	88	858	9,179
70-74	6	66	120	85	97	165	837	338	53	117	1,884	8,265
75-79	15	69	102	119	163	610	401	34	40	155	1,708	7,760
80-84	26	43	79	106	356	199	29	21	33	155	1,047	6,978
85-89	43	35	92	184	128	21	27	31	43	111	715	6,355
90-94	19	47	89	43	7	15	27	26	36	35	344	5,763
95-99	9	19	8	-	3	1	8	10	8	8	74	5,604
100 & Over	2	-	-	-	-	-	2	-	1	-	5	2,336
Total Count	120	287	523	570	787	1,074	1,415	869	449	716	**6,810**	
Avg Monthly Benefit	$ 3,223	$ 4,021	$ 4,436	$ 5,739	$ 7,357	$ 8,109	$ 9,556	$ 9,968	$ 8,891	$ 6,571		**$ 7,711**

Exhibit C-5h
Distribution of Retired Members by Age and Retirement Year
as of June 30, 2019
Safety Plan B

	Retirement Year											Average
Age	Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Total Count	Monthly Benefit
Under 35	-	-	-	-	-	-	1	3	1	25	30	$ 1,625
35-39	-	-	-	-	-	-	-	-	7	36	43	4,088
40-44	-	-	-	-	-	-	2	13	28	61	104	4,026
45-49	-	-	-	-	-	3	44	49	48	71	215	4,096
50-54	-	-	-	-	20	78	94	70	93	256	611	4,732
55-59	-	-	-	10	64	115	107	93	209	1,255	1,853	8,398
60-64	-	-	9	35	87	82	94	157	909	659	2,032	8,501
65-69	-	-	8	26	39	36	64	279	330	99	881	7,798
70-74	-	-	8	11	16	27	56	113	43	23	297	5,816
75-79	-	-	1	-	6	5	22	5	6	3	48	4,321
80-84	-	-	-	1	1	2	1	-	1	2	8	3,554
85-89	-	-	1	1	2	-	1	-	-	3	8	1,342
90-94	-	-	-	-	-	-	-	-	-	-	-	-
95-99	-	-	-	-	-	-	-	-	-	-	-	-
100 & Over	-	-	-	-	-	-	-	-	-	-	-	-
Total Count	-	-	27	84	235	348	486	782	1,675	2,493	**6,130**	
Avg Monthly Benefit	$ -	$ -	$ 2,370	$ 2,563	$ 3,420	$ 3,761	$ 4,158	$ 6,263	$ 8,357	$ 9,140		**$ 7,520**

Exhibit C-5i
Distribution of Retired Members and Beneficiaries by Age and Retirement Year
as of June 30, 2019
Safety Plan C

	Retirement Year											Average
											Total	Monthly
Age	Pre-1975	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19	Count	Benefit
Under 35	-	-	-	-	-	-	-	-	-	2	2	$ 2,830
35-39	-	-	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	-	-	-	1	1	2,917
45-49	-	-	-	-	-	-	-	-	-	-	-	-
50-54	-	-	-	-	-	-	-	-	-	-	-	-
55-59	-	-	-	-	-	-	-	-	-	2	2	1,100
60-64	-	-	-	-	-	-	-	-	-	-	-	-
65-69	-	-	-	-	-	-	-	-	-	1	1	23,144
70-74	-	-	-	-	-	-	-	-	1	-	1	17,848
75-79	-	-	-	-	-	-	-	-	-	-	-	-
80-84	-	-	-	-	-	-	-	-	-	-	-	-
85-89	-	-	-	-	-	-	-	-	-	-	-	-
90-94	-	-	-	-	-	-	-	-	-	-	-	-
95-99	-	-	-	-	-	-	-	-	-	-	-	-
100 & Over	-	-	-	-	-	-	-	-	-	-	-	-
Total Count	-	-	-	-	-	-	-	-	1	6	**7**	
Avg Monthly Benefit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 17,848	$ 5,654		**$ 7,396**

Appendix D Member Contribution Rates

This section illustrates the member normal contribution rates and the normal plus cost-of-living contribution rates by entry age.

Exhibit D-1
Normal Member Contribution Rates

	General					Safety		
Entry Age	Plan A	Plan B	Plan C	Plan D	Plan G	Plan A	Plan B	Plan C
16	2.68%	5.36%	4.57%	4.57%	7.36%	4.17%	8.34%	11.27%
17	2.74%	5.48%	4.66%	4.66%	7.36%	4.17%	8.34%	11.27%
18	2.80%	5.59%	4.76%	4.76%	7.36%	4.17%	8.34%	11.27%
19	2.86%	5.71%	4.87%	4.87%	7.36%	4.25%	8.50%	11.27%
20	2.92%	5.83%	4.97%	4.97%	7.36%	4.34%	8.67%	11.27%
21	2.98%	5.95%	5.07%	5.07%	7.36%	4.42%	8.85%	11.27%
22	3.04%	6.08%	5.18%	5.18%	7.36%	4.51%	9.03%	11.27%
23	3.10%	6.21%	5.29%	5.29%	7.36%	4.61%	9.21%	11.27%
24	3.17%	6.34%	5.40%	5.40%	7.36%	4.70%	9.40%	11.27%
25	3.24%	6.47%	5.52%	5.52%	7.36%	4.74%	9.48%	11.27%
26	3.30%	6.61%	5.63%	5.63%	7.36%	4.78%	9.55%	11.27%
27	3.37%	6.75%	5.75%	5.75%	7.36%	4.87%	9.75%	11.27%
28	3.45%	6.89%	5.87%	5.87%	7.36%	4.97%	9.95%	11.27%
29	3.52%	7.04%	6.00%	6.00%	7.36%	5.08%	10.15%	11.27%
30	3.59%	7.19%	6.12%	6.12%	7.36%	5.14%	10.28%	11.27%
31	3.67%	7.34%	6.25%	6.25%	7.36%	5.20%	10.40%	11.27%
32	3.75%	7.50%	6.38%	6.38%	7.36%	5.31%	10.61%	11.27%
33	3.83%	7.66%	6.52%	6.52%	7.36%	5.41%	10.83%	11.27%
34	3.91%	7.82%	6.66%	6.66%	7.36%	5.52%	11.04%	11.27%
35	3.99%	7.98%	6.80%	6.80%	7.36%	5.63%	11.27%	11.27%
36	4.07%	8.14%	6.95%	6.95%	7.36%	5.75%	11.49%	11.27%
37	4.15%	8.30%	7.10%	7.10%	7.36%	5.86%	11.72%	11.27%
38	4.23%	8.47%	7.25%	7.25%	7.36%	5.98%	11.95%	11.27%
39	4.32%	8.63%	7.40%	7.40%	7.36%	6.09%	12.19%	11.27%
40	4.40%	8.80%	7.55%	7.55%	7.36%	6.21%	12.43%	11.27%
41	4.49%	8.97%	7.70%	7.70%	7.36%	6.34%	12.67%	11.27%
42	4.57%	9.15%	7.85%	7.85%	7.36%	6.45%	12.91%	11.27%
43	4.66%	9.32%	8.01%	8.01%	7.36%	6.56%	13.12%	11.27%
44	4.75%	9.49%	8.17%	8.17%	7.36%	6.65%	13.30%	11.27%
45	4.83%	9.66%	8.33%	8.33%	7.36%	6.70%	13.40%	11.27%
46	4.91%	9.83%	8.49%	8.49%	7.36%	6.70%	13.40%	11.27%
47	4.99%	9.97%	8.66%	8.66%	7.36%	6.70%	13.40%	11.27%
48	5.04%	10.09%	8.82%	8.82%	7.36%	6.70%	13.40%	11.27%
49	5.09%	10.18%	8.98%	8.98%	7.36%	6.70%	13.40%	11.27%
50	5.12%	10.23%	9.14%	9.14%	7.36%	6.70%	13.40%	11.27%
51	5.13%	10.25%	9.30%	9.30%	7.36%	6.70%	13.40%	11.27%
52	5.13%	10.25%	9.43%	9.43%	7.36%	6.70%	13.40%	11.27%
53	5.13%	10.25%	9.54%	9.54%	7.36%	6.70%	13.40%	11.27%
54	5.13%	10.25%	9.63%	9.63%	7.36%	6.70%	13.40%	11.27%
55	5.13%	10.25%	9.68%	9.68%	7.36%	6.70%	13.40%	11.27%
56	5.13%	10.25%	9.70%	9.70%	7.36%	6.70%	13.40%	11.27%
57	5.13%	10.25%	9.70%	9.70%	7.36%	6.70%	13.40%	11.27%
58	5.13%	10.25%	9.70%	9.70%	7.36%	6.70%	13.40%	11.27%
59	5.13%	10.25%	9.70%	9.70%	7.36%	6.70%	13.40%	11.27%
60	5.13%	10.25%	9.70%	9.70%	7.36%	6.70%	13.40%	11.27%

Exhibit D-2
Normal Plus Cost-of-Living Member Contribution Rates

	General					Safety		
Entry Age	Plan A	Plan B	Plan C	Plan D	Plan G	Plan A	Plan B	Plan C
16	4.94%	6.75%	5.80%	5.76%	9.11%	7.80%	11.09%	14.54%
17	5.05%	6.90%	5.91%	5.87%	9.11%	7.80%	11.09%	14.54%
18	5.16%	7.04%	6.04%	5.99%	9.11%	7.80%	11.09%	14.54%
19	5.28%	7.19%	6.18%	6.13%	9.11%	7.95%	11.31%	14.54%
20	5.39%	7.34%	6.30%	6.26%	9.11%	8.12%	11.53%	14.54%
21	5.50%	7.49%	6.43%	6.39%	9.11%	8.27%	11.77%	14.54%
22	5.61%	7.65%	6.57%	6.52%	9.11%	8.44%	12.01%	14.54%
23	5.72%	7.82%	6.71%	6.66%	9.11%	8.63%	12.25%	14.54%
24	5.85%	7.98%	6.85%	6.80%	9.11%	8.80%	12.50%	14.54%
25	5.98%	8.15%	7.00%	6.95%	9.11%	8.87%	12.61%	14.54%
26	6.09%	8.32%	7.14%	7.09%	9.11%	8.95%	12.70%	14.54%
27	6.22%	8.50%	7.29%	7.24%	9.11%	9.11%	12.97%	14.54%
28	6.36%	8.67%	7.44%	7.39%	9.11%	9.30%	13.24%	14.54%
29	6.49%	8.86%	7.61%	7.56%	9.11%	9.51%	13.50%	14.54%
30	6.62%	9.05%	7.76%	7.71%	9.11%	9.62%	13.68%	14.54%
31	6.77%	9.24%	7.93%	7.87%	9.11%	9.73%	13.84%	14.54%
32	6.92%	9.44%	8.09%	8.03%	9.11%	9.94%	14.11%	14.54%
33	7.06%	9.64%	8.27%	8.21%	9.11%	10.12%	14.41%	14.54%
34	7.21%	9.85%	8.45%	8.39%	9.11%	10.33%	14.69%	14.54%
35	7.36%	10.05%	8.62%	8.56%	9.11%	10.54%	14.99%	14.54%
36	7.51%	10.25%	8.81%	8.75%	9.11%	10.76%	15.29%	14.54%
37	7.66%	10.45%	9.00%	8.94%	9.11%	10.97%	15.59%	14.54%
38	7.80%	10.66%	9.19%	9.13%	9.11%	11.19%	15.90%	14.54%
39	7.97%	10.87%	9.38%	9.32%	9.11%	11.40%	16.22%	14.54%
40	8.12%	11.08%	9.57%	9.51%	9.11%	11.62%	16.54%	14.54%
41	8.28%	11.29%	9.76%	9.70%	9.11%	11.87%	16.85%	14.54%
42	8.43%	11.52%	9.95%	9.89%	9.11%	12.07%	17.17%	14.54%
43	8.60%	11.73%	10.16%	10.09%	9.11%	12.28%	17.45%	14.54%
44	8.76%	11.95%	10.36%	10.29%	9.11%	12.45%	17.69%	14.54%
45	8.91%	12.16%	10.56%	10.49%	9.11%	12.54%	17.83%	14.54%
46	9.06%	12.38%	10.77%	10.69%	9.11%	12.54%	17.83%	14.54%
47	9.20%	12.55%	10.98%	10.91%	9.11%	12.54%	17.83%	14.54%
48	9.30%	12.70%	11.18%	11.11%	9.11%	12.54%	17.83%	14.54%
49	9.39%	12.82%	11.39%	11.31%	9.11%	12.54%	17.83%	14.54%
50	9.44%	12.88%	11.59%	11.51%	9.11%	12.54%	17.83%	14.54%
51	9.46%	12.90%	11.79%	11.71%	9.11%	12.54%	17.83%	14.54%
52	9.46%	12.90%	11.96%	11.88%	9.11%	12.54%	17.83%	14.54%
53	9.46%	12.90%	12.10%	12.01%	9.11%	12.54%	17.83%	14.54%
54	9.46%	12.90%	12.21%	12.13%	9.11%	12.54%	17.83%	14.54%
55	9.46%	12.90%	12.28%	12.19%	9.11%	12.54%	17.83%	14.54%
56	9.46%	12.90%	12.30%	12.22%	9.11%	12.54%	17.83%	14.54%
57	9.46%	12.90%	12.30%	12.22%	9.11%	12.54%	17.83%	14.54%
58	9.46%	12.90%	12.30%	12.22%	9.11%	12.54%	17.83%	14.54%
59	9.46%	12.90%	12.30%	12.22%	9.11%	12.54%	17.83%	14.54%
60	9.46%	12.90%	12.30%	12.22%	9.11%	12.54%	17.83%	14.54%

Appendix E Historical Information

This section presents historical statistical information on LACERA’s membership and the calculated contribution rates.

Exhibit E-1
Active Membership Data

	General Members					Safety Members					Total Members				
Valuation Date (June 30)	Number	Annual Salary (in millions)	Average Age	Average Service	Average Monthly Salary	Number	Annual Salary (in millions)	Average Age	Average Service	Average Monthly Salary	Number	Annual Salary (in millions)	Average Age	Average Service	Average Monthly Salary
1998	65,782	$ 2,837	44.7	12.9	$ 3,594	10,947	$ 725	39.9	13.8	$ 5,519	76,729	$ 3,562	44.0	13.0	$ 3,870
1999	68,652	$ 3,105	44.6	12.7	$ 3,769	11,024	$ 753	40.0	13.7	$ 5,696	79,676	$ 3,858	43.9	12.8	$ 4,035
2000	71,940	$ 3,353	44.4	12.5	$ 3,884	11,264	$ 790	39.8	13.8	$ 5,849	83,204	$ 4,143	43.8	12.6	$ 4,150
2001	75,048	$ 3,608	44.5	12.3	$ 4,006	12,021	$ 860	39.6	13.0	$ 5,967	87,069	$ 4,468	43.9	12.4	$ 4,277
2002	77,062	$ 3,833	44.7	12.3	$ 4,145	12,190	$ 894	39.6	13.8	$ 6,115	89,252	$ 4,727	44.0	12.5	$ 4,414
2003	75,995	$ 3,954	45.2	12.7	$ 4,336	11,765	$ 899	40.1	13.7	$ 6,370	87,760	$ 4,853	44.5	12.9	$ 4,609
2004	74,826	$ 3,967	45.6	13.1	$ 4,418	11,409	$ 885	40.6	14.7	$ 6,467	86,235	$ 4,852	44.9	13.3	$ 4,689
2005	75,167	$ 4,046	45.8	13.2	$ 4,486	11,217	$ 905	41.0	14.9	$ 6,722	86,384	$ 4,951	45.2	13.4	$ 4,777
2006	77,167	$ 4,267	45.7	13.0	$ 4,608	11,464	$ 969	41.2	15.0	$ 7,047	88,631	$ 5,236	45.1	13.3	$ 4,924
2007	79,829	$ 4,673	45.7	12.8	$ 4,878	12,267	$ 1,104	40.8	14.4	$ 7,499	92,096	$ 5,777	45.1	13.0	$ 5,227
2008	81,664	$ 5,017	45.8	12.8	$ 5,119	12,828	$ 1,187	40.5	13.7	$ 7,714	94,492	$ 6,204	45.1	12.9	$ 5,471
2009	82,878	$ 5,348	46.1	13.1	$ 5,377	12,910	$ 1,240	40.8	14.0	$ 8,002	95,788	$ 6,588	45.4	13.2	$ 5,731
2010	81,413	$ 5,318	46.6	13.6	$ 5,444	12,997	$ 1,257	41.3	14.5	$ 8,062	94,410	$ 6,575	45.9	13.7	$ 5,804
2011	80,145	$ 5,295	47.0	14.0	$ 5,506	12,641	$ 1,240	41.9	15.1	$ 8,172	92,786	$ 6,535	46.3	14.2	$ 5,869
2012	79,467	$ 5,272	47.3	14.4	$ 5,528	12,485	$ 1,230	42.3	15.5	$ 8,209	91,952	$ 6,502	46.7	14.6	$ 5,892
2013	79,006	$ 5,253	47.6	14.8	$ 5,541	12,539	$ 1,235	42.3	15.7	$ 8,207	91,545	$ 6,488	46.9	14.9	$ 5,906
2014	79,943	$ 5,488	47.6	14.9	$ 5,720	12,523	$ 1,253	42.6	15.8	$ 8,337	92,466	$ 6,741	47.0	15.0	$ 6,075
2015	81,228	$ 5,706	47.6	14.8	$ 5,854	12,446	$ 1,300	42.8	16.0	$ 8,702	93,674	$ 7,006	46.9	15.0	$ 6,233
2016	82,916	$ 5,950	47.4	14.6	$ 5,980	12,528	$ 1,343	42.8	16.0	$ 8,931	95,444	$ 7,293	46.8	14.8	$ 6,367
2017	84,513	$ 6,290	47.3	14.5	$ 6,202	12,698	$ 1,388	42.5	15.6	$ 9,110	97,211	$ 7,678	46.7	14.6	$ 6,582
2018	85,703	$ 6,610	47.2	14.4	$ 6,428	12,771	$ 1,452	42.2	15.3	$ 9,471	98,474	$ 8,062	46.6	14.5	$ 6,822
2019	86,392	$ 6,816	47.3	14.4	$ 6,574	12,794	$ 1,540	42.0	15.1	$ 10,032	99,186	$ 8,356	46.6	14.5	$ 7,020

Exhibit E-2
Retired Membership Data

	General Members				Safety Members				Total Members			
Valuation Date (June 30)	Number	Annual Allowance (in millions)	Average Age	Average Monthly Benefit	Number	Annual Allowance (in millions)	Average Age	Average Monthly Benefit	Number	Annual Allowance (in millions)	Average Age	Average Monthly Benefit
1998	35,462	$ 692	71.1	$ 1,626	7,425	$ 267	62.5	$ 3,001	42,887	$ 959	69.6	$ 1,864
1999	35,837	$ 725	71.4	$ 1,686	7,674	$ 291	63.1	$ 3,166	43,511	$ 1,016	70.0	$ 1,947
2000	36,596	$ 780	71.4	$ 1,778	8,032	$ 324	63.1	$ 3,358	44,628	$ 1,104	69.9	$ 2,062
2001	37,077	$ 890	71.6	$ 2,001	8,319	$ 382	63.4	$ 3,828	45,396	$ 1,272	70.1	$ 2,336
2002	37,618	$ 914	71.8	$ 2,025	8,624	$ 403	63.7	$ 3,892	46,242	$ 1,317	70.3	$ 2,374
2003	38,283	$ 984	71.9	$ 2,142	8,949	$ 443	63.9	$ 4,128	47,232	$ 1,427	70.4	$ 2,518
2004	39,097	$ 1,056	72.0	$ 2,250	9,235	$ 478	64.2	$ 4,318	48,332	$ 1,534	70.5	$ 2,645
2005	40,251	$ 1,138	72.1	$ 2,355	9,518	$ 514	64.6	$ 4,504	49,769	$ 1,652	70.7	$ 2,766
2006	41,309	$ 1,224	72.2	$ 2,469	9,683	$ 549	65.0	$ 4,728	50,992	$ 1,773	70.8	$ 2,898
2007	41,584	$ 1,280	72.2	$ 2,565	9,808	$ 578	65.4	$ 4,914	51,392	$ 1,858	70.9	$ 3,013
2008	42,298	$ 1,356	72.4	$ 2,671	10,052	$ 623	65.8	$ 5,167	52,350	$ 1,979	71.1	$ 3,150
2009	42,825	$ 1,423	72.6	$ 2,768	10,244	$ 663	66.3	$ 5,394	53,069	$ 2,086	71.4	$ 3,275
2010	43,752	$ 1,514	72.7	$ 2,883	10,444	$ 706	66.7	$ 5,638	54,196	$ 2,220	71.6	$ 3,414
2011	44,726	$ 1,597	72.9	$ 2,976	10,645	$ 746	67.0	$ 5,836	55,371	$ 2,343	71.7	$ 3,526
2012	45,899	$ 1,686	73.0	$ 3,061	10,871	$ 789	67.3	$ 6,049	56,770	$ 2,475	71.9	$ 3,633
2013	46,939	$ 1,774	73.2	$ 3,149	11,147	$ 837	67.5	$ 6,261	58,086	$ 2,611	72.1	$ 3,746
2014	47,867	$ 1,836	73.4	$ 3,196	11,362	$ 876	67.8	$ 6,427	59,229	$ 2,712	72.3	$ 3,816
2015	48,958	$ 1,898	73.5	$ 3,231	11,648	$ 914	68.0	$ 6,541	60,606	$ 2,813	72.5	$ 3,867
2016	50,034	$ 1,988	73.6	$ 3,311	11,880	$ 965	68.3	$ 6,766	61,914	$ 2,952	72.6	$ 3,974
2017	51,083	$ 2,079	73.8	$ 3,391	12,241	$ 1,030	68.4	$ 7,012	63,324	$ 3,109	72.7	$ 4,091
2018	52,292	$ 2,192	73.9	$ 3,493	12,588	$ 1,104	68.5	$ 7,308	64,880	$ 3,296	72.8	$ 4,233
2019	53,560	$ 2,316	73.9	$ 3,603	12,947	$ 1,184	68.6	$ 7,620	66,507	$ 3,500	72.9	$ 4,385

Exhibit E-3
Contribution Rates

	General Plans					Safety Plans					Total All Plans				
Valuation Date (June 30)	Calculated Normal Cost	Member Contributions	Net Employer Normal Cost	UAAL Rate	Total Employer Contribution	Calculated Normal Cost	Member Contributions	Net Employer Normal Cost	UAAL Rate	Total Employer Contribution	Calculated Normal Cost	Member Contributions	Net Employer Normal Cost	UAAL Rate	Total Employer Contribution
1998	10.27%	3.06%	7.21%	0.00%	7.21%	25.00%	8.70%	16.30%	0.00%	16.30%	13.27%	4.21%	9.06%	0.00%	9.06%
1999	10.98%	3.20%	7.78%	0.00%	7.78%	25.41%	9.12%	16.29%	0.00%	16.29%	13.81%	4.36%	9.45%	0.00%	9.45%
2000	10.91%	3.33%	7.58%	0.00%	7.58%	25.22%	9.44%	15.78%	0.00%	15.78%	13.66%	4.51%	9.15%	0.00%	9.15%
2001	11.27%	3.45%	7.82%	0.00%	7.82%	25.47%	9.27%	16.20%	0.00%	16.20%	14.01%	4.57%	9.44%	0.00%	9.44%
2002	12.04%	3.53%	8.51%	0.21%	8.72%	25.92%	9.37%	16.55%	0.21%	16.76%	14.66%	4.63%	10.03%	0.21%	10.24%
2003	12.25%	3.72%	8.53%	4.66%	13.19%	25.89%	9.55%	16.34%	4.66%	21.00%	14.80%	4.81%	9.99%	4.66%	14.65%
2004	12.20%	3.82%	8.38%	6.41%	14.79%	24.61%	9.61%	15.00%	6.41%	21.41%	14.48%	4.88%	9.60%	6.41%	16.01%
2005	12.22%	3.91%	8.31%	5.33%	13.64%	24.69%	9.68%	15.01%	5.33%	20.34%	14.50%	4.97%	9.53%	5.33%	14.86%
2006	12.22%	4.07%	8.15%	3.49%	11.64%	24.70%	9.70%	15.00%	3.49%	18.49%	14.54%	5.12%	9.42%	3.49%	12.91%
2007	13.15%	4.38%	8.77%	2.24%	11.01%	26.04%	10.18%	15.86%	2.24%	18.10%	15.67%	5.51%	10.16%	2.24%	12.40%
2008	13.18%	4.47%	8.71%	1.99%	10.70%	26.01%	10.22%	15.79%	1.99%	17.78%	15.68%	5.59%	10.09%	1.99%	12.08%
2009	13.29%	4.57%	8.72%	4.12%	12.84%	26.08%	10.21%	15.87%	4.12%	19.99%	15.75%	5.65%	10.10%	4.12%	14.22%
2010	13.32%	4.68%	8.64%	6.47%	15.11%	25.00%	10.19%	14.81%	6.47%	21.28%	15.59%	5.75%	9.84%	6.47%	16.31%
2011	13.36%	4.91%	8.45%	7.89%	16.34%	25.09%	10.50%	14.59%	7.89%	22.48%	15.65%	6.00%	9.65%	7.89%	17.54%
2012	13.50%	5.01%	8.49%	10.09%	18.58%	25.42%	10.52%	14.90%	10.09%	24.99%	15.81%	6.08%	9.73%	10.09%	19.82%
2013	13.25%	5.01%	8.24%	11.90%	20.14%	24.67%	10.26%	14.41%	11.90%	26.31%	15.47%	6.03%	9.44%	11.90%	21.34%
2014	13.14%	5.09%	8.05%	10.04%	18.09%	24.71%	10.23%	14.48%	10.04%	24.52%	15.37%	6.08%	9.29%	10.04%	19.33%
2015	13.28%	5.22%	8.06%	8.49%	16.55%	24.71%	10.26%	14.45%	8.49%	22.94%	15.46%	6.18%	9.28%	8.49%	17.77%
2016	14.51%	5.72%	8.79%	9.73%	18.52%	25.54%	10.57%	14.97%	9.73%	24.70%	16.62%	6.65%	9.97%	9.73%	19.70%
2017	14.62%	5.87%	8.75%	10.10%	18.85%	25.69%	10.56%	15.13%	10.10%	25.23%	16.70%	6.76%	9.94%	10.10%	20.04%
2018	14.77%	6.04%	8.73%	10.99%	19.72%	25.70%	10.59%	15.11%	10.99%	26.10%	16.80%	6.88%	9.92%	10.99%	20.91%
2019	16.24%	6.74%	9.50%	11.73%	21.23%	28.58%	11.78%	16.80%	11.73%	28.53%	18.54%	7.68%	10.86%	11.73%	22.59%

Exhibit E-4
Funded Status History

(Dollars in Millions)

Valuation Year	Actuarial Accrued Liability (AAL)	Market Value Basis: Market Value of Assets (MVA)[1]	Market Value Basis: Unfunded AAL (UAAL)/Surplus MVA Basis	Market Value Basis: Funded Ratio MVA Basis	Actuarial Value Basis: Actuarial Value of Assets (AVA)[1]	Actuarial Value Basis: Unfunded AAL (UAAL)/Surplus AVA Basis	Actuarial Value Basis: Funded Ratio AVA Basis	Annual Total Payroll	Asset Smoothing Ratio (AVA / MVA)	Asset Volatility Ratio (MVA / Payroll)	Liability Volatility Ratio (AAL / Payroll)
1996 [2]	17,300	18,600	1,300	107.5%	17,700	400	102.3%	3,356	95.2%	5.5	5.2
1997 [2]	19,300	21,100	1,800	109.3%	19,600	300	101.6%	3,373	92.9%	6.3	5.7
1998	20,960	22,332	1,372	106.5%	20,851	(109)	99.5%	3,562	93.4%	6.3	5.9
1999	22,785	24,382	1,597	107.0%	23,536	751	103.3%	3,858	96.5%	6.3	5.9
2000	24,721	27,257	2,536	110.3%	25,427	706	102.9%	4,143	93.3%	6.6	6.0
2001	26,490	23,916	(2,574)	90.3%	26,490	-	100.0%	4,469	110.8%	5.4	5.9
2002	28,437	24,085	(4,352)	84.7%	28,262	(175)	99.4%	4,730	117.3%	5.1	6.0
2003	30,474	24,616	(5,858)	80.8%	26,564	(3,910)	87.2%	4,934	107.9%	5.0	6.2
2004	32,700	28,094	(4,606)	85.9%	27,089	(5,611)	82.8%	4,942	96.4%	5.7	6.6
2005	34,375	30,904	(3,471)	89.9%	29,497	(4,878)	85.8%	5,051	95.4%	6.1	6.8
2006	36,259	34,256	(2,003)	94.5%	32,820	(3,439)	90.5%	5,333	95.8%	6.4	6.8
2007	39,503	40,073	570	101.4%	37,042	(2,461)	93.8%	5,886	92.4%	6.8	6.7
2008	41,975	37,834	(4,141)	90.1%	39,662	(2,313)	94.5%	6,257	104.8%	6.0	6.7
2009	44,469	29,723	(14,746)	66.8%	39,542	(4,927)	88.9%	6,673	133.0%	4.5	6.7
2010	46,646	32,629	(14,017)	69.9%	38,839	(7,807)	83.3%	6,739	119.0%	4.8	6.9
2011	48,599	38,587	(10,012)	79.4%	39,194	(9,405)	80.6%	6,705	101.6%	5.8	7.2
2012	50,809	37,453	(13,356)	73.7%	39,039	(11,770)	76.8%	6,675	104.2%	5.6	7.6
2013	53,247	41,334	(11,913)	77.6%	39,932	(13,315)	75.0%	6,656	96.6%	6.2	8.0
2014	54,942	47,223	(7,719)	86.0%	43,654	(11,288)	79.5%	6,815	92.4%	6.9	8.1
2015	56,819	48,308	(8,511)	85.0%	47,328	(9,491)	83.3%	7,078	98.0%	6.8	8.0
2016	62,199	47,347	(14,852)	76.1%	49,358	(12,841)	79.4%	7,390	104.2%	6.4	8.4
2017	65,311	52,217	(13,094)	80.0%	52,166	(13,145)	79.9%	7,749	99.9%	6.7	8.4
2018	68,527	55,737	(12,790)	81.3%	55,233	(13,294)	80.6%	8,079	99.1%	6.9	8.5
2019	74,635	57,712	(16,923)	77.3%	57,617	(17,018)	77.2%	8,423	99.8%	6.9	8.9

1. *Asset values exclude non-valuation reserves*
2. *Only rounded values are available.*

Exhibit E-5
Reconciliation of Changes in Unfunded Actuarial Accrued Liability or Surplus

(Dollars in Millions)

Valuation Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Prior Year UAAL	4,927	7,807	9,405	11,770	13,315	11,288	9,491	12,841	13,145	13,294
Normal Cost	1,219	1,200	1,237	1,430	1,163	1,068	1,118	1,246	1,243	1,352
Contributions	(1,322)	(1,461)	(1,646)	(1,455)	(1,824)	(1,936)	(1,902)	(1,880)	(2,116)	(2,303)
Interest	382	605	724	895	999	814	682	954	968	976
Changes in Assumptions/Methodology	54	221	457	511	-	-	2,922	-	-	2,528
Changes in Benefit Provisions	-	-	-	-	-	-	-	-	-	-
Expected Current Year UAAL	5,260	8,372	10,177	13,151	13,653	11,234	12,311	13,161	13,240	15,847
Actual Current Year UAAL	7,807	9,405	11,770	13,315	11,288	9,491	12,841	13,145	13,294	17,018
Total (Gain)/Loss on UAAL	2,547	1,033	1,593	164	(2,365)	(1,743)	530	(16)	54	1,171
Asset (Gains)/Losses	2,879	1,761	2,337	893	(1,664)	(1,263)	496	(421)	(411)	477
Ventura Settlement/Court Cases	-	-	-	-	-	-	-	-	-	-
Salary Increases	(353)	(579)	(629)	(563)	(291)	79	162	277	223	486
All Other Actuarial (Gains)/Losses	21	(149)	(115)	(166)	(410)	(559)	(128)	128	242	208

Exhibit E-6
Reconciliation of Changes in Calculated Employer Contribution Rate

Valuation Year	Prior Year Contribution Rate	Changes in Existing Amortization Bases	Assumption/ Method Changes	Salary/Payroll Variations	Plan Amendments	Asset (Gains)/Losses	Demographic/Other (Gains)/Losses	Current Year Contribution Rate
2004	14.65%	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	16.01%
2005	16.01%	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	14.86%
2006	14.86%	-0.29%	0.00%	0.02%	0.00%	-1.82%	0.14%	12.91%
2007	12.91%	-0.28%	1.34%	0.61%	0.00%	-2.14%	-0.04%	12.40%
2008	12.40%	-0.17%	0.00%	0.21%	0.00%	-0.24%	-0.12%	12.08%
2009	12.08%	-0.04%	-1.76%	0.21%	0.00%	3.91%	-0.18%	14.22%
2010	14.22%	0.00%	-0.27%	-0.10%	0.00%	2.29%	0.17%	16.31%
2011	16.31%	0.00%	0.25%	-0.14%	0.00%	1.39%	-0.27%	17.54%
2012	17.54%	0.00%	0.54%	-0.11%	0.00%	1.92%	-0.07%	19.82%
2013	19.82%	0.00%	0.82%	-0.01%	0.00%	0.74%	-0.03%	21.34%
2014	21.34%	0.00%	0.00%	-0.15%	0.00%	-1.43%	-0.43%	19.33%
2015	19.33%	0.00%	0.00%	0.04%	0.00%	-1.04%	-0.56%	17.77%
2016	17.77%	0.00%	2.87%	0.20%	0.00%	0.39%	-0.02%	21.21%
2017	21.21%	0.00%	0.00%	0.05%	0.00%	-0.32%	0.06%	21.00%
2018	21.00%	0.00%	0.00%	0.04%	0.00%	-0.30%	0.17%	20.91%
2019	20.91%	0.00%	1.10%	0.20%	0.00%	0.42%	-0.04%	22.59%

1. Data not available.

Exhibit E-7
Funding Policy History

	Description of changes, if any	Effective Date	Impact on Contribution Rate	Impact on Funded Ratio	Rationale
2009	Changed from 3-year to 5-year asset smoothing. Included STAR reserve as a valuation asset. Adopted 30-year layered amortization period.	June 30, 2009	-1.68% [1]	4.40%	See June 30, 2009 valuation report.
2010	Included STAR reserve as a valuation asset.	June 30, 2010	-0.52% [1]	1.40%	See June 30, 2010 valuation report.
2011	Included STAR reserve as a valuation asset.	June 30, 2011	-0.52% [1]	1.20%	See June 30, 2011 valuation report.
2012	Included STAR reserve as a valuation asset for 2012 and future valuations (adopted February 2013).	June 30, 2012	-0.53% [1]	1.20%	See June 30, 2012 valuation report.
2019	Adopted 20-year layered amortization period for new layers. Existing layers are set to be no greater than 22 years, so they are fully amortized no later than 2042.	June 30, 2019	0.30%	0.00%	See June 30, 2019 valuation report.

1. Note that savings due to inclusion of STAR reserve as valuation asset are not cumulative from year to year.

Exhibit E-8
History of Changes in Economic Assumptions

(Years with no changes excluded)

Valuation Year	Price Inflation	Wage Inflation	Real Wage Inflation[1]	Investment Return Assumption	Real Investment Return[2]	Effective Date	Change in Contribution Rate	Change in Funded Ratio	Rationale
2004	3.50%	3.75%	0.25%	7.75%	4.25%	July 1, 2004	1.65%	N/A[3]	See 2004 Investigation of Experience Report.
2007	3.50%	4.00%	0.50%	7.75%	4.25%	July 1, 2007	0.66%	-1.3%	See 2007 Investigation of Experience Report.
2011	3.45%	3.95%	0.50%	7.70%	4.25%	July 1, 2011	0.25%	-0.3%	See 2010 Investigation of Experience Report.
2012	3.35%	3.85%	0.50%	7.60%	4.25%	July 1, 2012	0.54%	-0.7%	See 2010 Investigation of Experience Report.
2013	3.00%	3.50%	0.50%	7.50%	4.50%	July 1, 2013	0.37%	-0.1%	See 2013 Investigation of Experience Report.
2016	2.75%	3.25%	0.50%	7.25%	4.50%	July 1, 2016	1.14%	-1.4%	See 2016 Investigation of Experience Report.
2019	2.75%	3.25%	0.50%	7.00%	4.25%	July 1, 2019	2.20%	-2.3%	2019 Investigation of Experience.

1. *Excess of assumed wage inflation over price inflation.*
2. *Excess of assumed investment return over price inflation.*
3. *Information not available.*

Exhibit E-9
History of Changes in Demographic and Other Non-Economic Assumptions

(Years with no changes excluded)

	Demographic Assumption Revisions	Effective Date	Change in Contribution Rate	Change in Funded Ratio	Rationale
2004	Mortality, merit salary scale, retirement, termination, probability of refund, probability of eligible survivor revised.	July 1, 2004	-0.63%	N/A[1]	Refer to the 2004 Investigation of Experience Report.
2007	Mortality, retirement, termination, probability of refund, merit salary scale for Safety members revised.	July 1, 2007	0.68%	N/A[1]	Refer to the 2007 Investigation of Experience Report.
2010	Mortality, retirement, termination, probability of refund, assumed benefit commencement age revised.	July 1, 2010	-0.27%	-0.1%	Refer to the 2010 Investigation of Experience Report.
2013	Mortality, retirement, termination, probability of refund, merit salary scale for Safety members, probability of eligible survivor, assumption for beneficiary age, reciprocity assumption revised.	July 1, 2013	0.45%	-0.6%	Refer to the 2013 Investigation of Experience Report.
2016	Mortality, retirement, termination, probability of eligible survivor, assumed benefit commencement age, reciprocity assumption revised.	July 1, 2016	1.73%	-2.5%	Refer to the 2016 Investigation of Experience Report.
2019	Mortality, retirement, termination, probability of refund, merit salary scale, assumed benefit commencement age.	July 1, 2019	0.80%	-0.4%	2019 Investigation of Experience.

1. Information not available.

Appendix F Glossary

The following definitions include excerpts from a list adopted by the major actuarial organizations in the United States. In some cases, the definitions have been modified for specific applicability to LACERA and include terms used exclusively by LACERA. Defined terms are capitalized throughout this Appendix.

Accrued Benefit

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

Actuarial Accrued Liability

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

Actuarial Gain (Loss)

A measure of the difference between actual experience and that expected based on a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

Actuarial Present Value

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Valuation

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

Amortization Payment

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Contingency Reserve

Reserves accumulated for future earning deficiencies, investment losses, and other contingencies. Additions include investment income and other revenues; deductions include investment expense, administrative expense, interest allocated to other reserves, funding the STAR Reserve, and distributions to the Contribution Credit Reserve. Amounts are allocated to the Contingency Reserve to the extent there are positive recognized earnings to allocate. The California Government Code (Sections 31592 and 31592.2) requires the Contingency Reserve to be set at a minimum of 1.0% of the market value of total assets.

County Contribution Credit Reserve

The accumulated balance of the County's proportionate share of excess earnings as stipulated in the Retirement System Funding Agreement between LACERA and the County. Additions include distributions from excess earning during the fiscal years ending 1994 through 1998 and related earnings. Deductions include payments, as the County authorizes, for future employer contributions due LACERA and for funding a portion of the Retiree Healthcare Program under the provisions of Internal Revenue Code 401(h).

Employer Reserve

The accumulation of employer contributions for future retirement benefit payments. Additions include contributions from employers and related earnings. Deductions include annuity payments to retired members and survivors, lump sum death benefit payments to member survivors, and supplemental disability payments.

Entry Age Actuarial Cost Method

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

Funded Ratio

A measurement of the funded status of the Plan. The Funded Ratio is calculated by dividing the Valuation Assets by the Actuarial Accrued Liability. For example, a Funded Ratio of 90% indicates assets are 10% less than liabilities.

Funding Goal

The Funding Goal is the funded status the Board of Investments would like LACERA to achieve. The main goal is to provide benefit security for its members as well as to achieve and maintain stable employer contributions that are as low as possible. A Funded Ratio equal to 100% is the Funding Goal.

Layered Amortization Period

Payment of each year's change in the Unfunded Actuarial Accrued Liability (UAAL) is amortized over separate closed periods. For LACERA, the original UAAL as of June 30, 2009 is being amortized over a closed 30-year period. Subsequent changes in the UAAL were amortized over new closed 30-year periods. Effective with the June 30, 2019 valuation all existing layers with more than 22 years remaining as of June 30, 2020 were re-amortized over closed 22-year periods. All new UAAL layers thereafter are amortized over closed 20-year periods beginning with the date the contribution is first expected to be made. All amortization payments are based on a level percent of pay.

Member Reserve

The accumulation of member contributions. Additions include member contributions and related earnings. Deductions include annuity payments to retirees and refunds to members.

Non-Valuation Reserves

Reserves excluded from the calculation of contribution rates, including the Contingency Reserve, the County Contribution Credit Reserve, and any other reserves specifically excluded by the Board of Investments.

Normal Cost

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Plan Year

A 12-month period beginning July 1 and ending June 30.

Projected Benefits

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.

STAR Reserve

Reserves accumulated for the payment of cost-of-living benefits as defined in California Government Code Section 31874.3.

Supplemental Targeted Adjustment for Retirees (STAR) Benefits Supplemental cost-of-living payments to retired members to restore purchasing power at a specified percentage level, as described in California Government Code Section 31874.3.

Surplus Funding

The excess, if any, of the Actuarial Value of Assets over the Actuarial Accrued Liability. Standard actuarial terminology defines this as the “Funding Excess.” LACERA uses the term “Surplus Funding.”

Unfunded Actuarial Accrued Liability

The excess, if any, of the Actuarial Accrued Liability over the Actuarial Value of Assets.

Valuation Date

The date upon which the Normal Cost, Actuarial Accrued Liability, and Actuarial Value of Assets are determined. Generally, the Valuation Date will coincide with the ending of a Plan Year.

Valuation Reserves

All reserves excluding the Non-Valuation Reserves.

FOR INFORMATION ONLY

October 5, 2020

TO: Trustees – Board of Investments

FROM: Ted Wright, CFA, FRM, PRM, CAIA TW
Principal Investment Officer

Jude Pérez JP
Principal Investment Officer

Mel Tsao MT
Senior Investment Analyst

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: **NET ALPHA ADVISORS: REPORT ON LACERA INTERNALIZATION OF INVESTMENT MANAGEMENT**

At the August 8, 2018 LACERA Board of Investments ("BOI" or "Board") meeting, there was interest and discussion about internal management of the TIPS allocation. Based upon this discussion, staff was asked to conduct a preliminary assessment of the merits and risks of bringing internal investment management in house and report any findings to the Board.

In a follow up to the request, at the February 13, 2019 BOI meeting, staff presented an initial internal review of a cost-benefit analysis in internal management. Preliminary findings determined that potential merits and qualitative considerations for LACERA to manage assets internally may exist. Furthermore, at the June 12, 2019 BOI meeting, staff built upon the initial review and presented an assessment of implementation, experience, and requirements which was further contextualized at the July 1, 2019 BOI Off-site. At this meeting, guest speakers from the Oregon State Treasury and the Utah Retirement System shared with Trustees their background and experiences in working at a peer plan and managing assets internally. Based upon this discussion, Trustees directed staff to engage further to provide granularity and structure on how LACERA can best implement an internal investment management program and independently validate whether internalization is feasible.

Following the 2019 Board Off-site, staff reached out to Meketa Investment Group and peer public plans to determine a field of consultants who could help serve as subject matter experts in internal asset management. A scope of work was developed, and two firms were identified to submit proposals. Upon review, Net Alpha Advisors ("Net Alpha"), was selected to assist LACERA in determining the feasibility of internalization and to develop a long term and sustainable growth strategy to manage assets internally.

An internal and cross-functional team within LACERA consisting of the Investment Division and Financial and Accounting Services Division worked together with Net Alpha. Additionally, Net Alpha's report and recommendations were also shared with Internal Audit and the Information Systems Division for reasonableness, impact, and consideration.

Please note that this work was completed prior to the pandemic. Originally, Net Alpha was scheduled to present their findings and recommendations at the March 16, 2020 BOI meeting. However, due to the escalation and gravity of the COVID-19 pandemic and the sudden concurrent transition to a work-from-home environment, there are material delays with the project plan until there is greater clarity about returning to the office. The work will continue and reflect the new realities of COVID-19. The attached report is Net Alpha's initial review, analysis, and recommendation.

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

Attachments
TW:JP:MT:mt

ATTACHMENT

LACERA Internalization of Investment Management Report

Prepared for Los Angeles County Employees Retirement Association

Net Alpha Advisors
Tim Sargent – Managing Partner
Alex Lin - Director

October 2020

Table of Contents

Introduction

Net Alpha Advisors (NAA) has prepared analyses and recommendations to support LACERA's investigation into internalizing passive equity index strategies. This report focuses on building the infrastructure and systems for the internal management of the US portion of the MSCI ACWI IMI strategy and explores the feasibility and economies of scale for internal management of US factor-based strategies, non-US developed markets, and other asset classes.

NAA's recommended build is geared towards cost savings and a robust infrastructure through the utilization of the experience and skills of the current LACERA staff and outsourcing other responsibilities in a scalable and cost-effective manner. This build will allow LACERA to stand up internal management relatively quickly, enjoy economies of scale for moving into different strategies, regions, and asset classes, and maintain flexibility for structural changes in the future.

The rest of the report is sectioned as follows: executive summary; technology review and recommendations; general considerations; system build; build cost; alternative scenarios, project expansion/phases; timeline.

Executive Summary

NAA's research finds that the internal management of a passive US equity index can achieve cost savings compared to current fees paid for outside management while still building and maintaining a robust and scalable infrastructure for future expansion into the internal management of factor-based strategies, global equities, and other asset classes.

NAA recommends the following components for building the internal management capabilities:

- Full replication - buying all the securities in the index in the exact weight as the index.
- Outsourcing of the middle and back office responsibilities.
- Internal trading.

The recommended build will cost **$192,075**, which is a cost savings of **$507,925** compared to the median fee charged to a large pension plan for passive management of the US stock index.

The estimated time to live trading of the portfolio, based on the recommended build, will be approximately 18 months from project approval and commencement.

Subsequent internalizing of other strategies can lead to significant savings through economies of scale and leveraging built infrastructure and systems.

Technology Review and Recommendations

LACERA's current technology infrastructure

- Support: Internal Systems Division
- Network: Speeds of 130Mbps download and 80Mbps upload with uncertain QoS priority settings for user/department
- Workstations:
  - Specs: i7chips, 2.8 GHz processing, 16GB RAM
  - Software: Win10 Enterprise, MSFT Office
  - Connectivity: LAN networked
- Servers: shared servers with computation done locally on desktop
- Backup and Data Continuity: TBD

Technology infrastructure recommendations

- Network
  - Dependent on scenarios (i.e. internal vs. outsourced trading), but at the very least, top priority in either the server or workstation (depending on setup) that will be responsible for sending orders / order management.
  - If trading is handled internally, a dedicated line for orders / order management is the best practice and almost certainly a requirement.
  - Bandwidth availability can be conservatively set at 1.5x highest recorded bandwidth during trading (or through simulations) and warnings/surge overrides can be set as the limits are approached.
    - This shouldn't be very high and so should be reasonable to allocate without affecting overall speed.
    - This can also be managed – for example, if trades only entered before market open, the increased bandwidth can be allocated for specific times of a day.
- Servers
  - NAA recommends a dedicated server accessible by team members for storage and calculations.
    - The server does not need to be separate from internal systems.
    - Partitioning current servers or folders with priority and restrictions settings on shared servers are alternatives.
    - The main concerns with shared servers are: priority of processing power / RAM; priority of bandwidth; access rights; capacity; maintenance/update schedules; server downtime.
  - Storage: market and reference data, security master, models and backtests, analyses and reports.
  - Calculations: portfolio, risk, backtests, optimizations, trade analyses.

- Market and reference data should probably be stored in a relational database for easy retrieval and manipulation.
  - Refer to Internal Systems Division for preferred method of storage.
- Even if processes will be conducted on a platform, a daily download of the data is the best practice and useful for verification and audit purposes.
- Daily file size estimates:

Data	Size
US End-of-Day OHLC	500kb
US intraday quote	600mb
Global End-of-Day OHLC	3mb
US corporate actions	5kb
Global corporate actions	30kb
US fundamentals	24mb
Global fundamentals	100mb

- Not including the US intraday quote data, one year of data will require approximately 32 gigabytes of storage. A 30-year history, which is recommended for any backtesting purposes, will require approximately 950 gigabytes of storage.
- <u>Security</u>
  - Limit access to server for those not directly involved in processes
  - Logging of access and amendments
  - Rely primarily on read-only, maintaining an audit trail of corrections (i.e. maintain both a point-in-time file and amended file) and having further analyses rely on copying the original files to separate workspaces to avoid any accidental changes
- <u>Automation of processes</u>
  - Daily download of data should be automated and sanity checked
    - Market data; reference data (corporate actions, dividend forecasting, fundamentals, security master); trade files; portfolio positions; reports (risk, p&l, settlement, clearance)

- Backup and Data Continuity:
  - What to do in case power and/or internet goes out
    - Laptop with wireless connection that can access EMS / broker / method of sending orders

Using a conservative cost-per-gigabyte of $0.025/GB per month and assuming a 1:1 ratio of raw data to processed data (e.g. reports, calculations, metadata), the cost of storing all data related to internalizing passive equity index strategies is $575.00. Server OS and application will cost around $1,000 and a relational database will cost around $1,000. Setting up and integrating the server will take two weeks and administration will require on average one day a week. Automation of processes will take two weeks and one day per quarter for review.

For backup and continuity, purchasing a laptop and installing all the required software will cost $2,000. A monthly wireless connection will cost $50 per month.

The Technology Infrastructure recommendations will cost approximately **$5,175**.

General Considerations

No Voice Orders, Everything Electronic

Maintaining a record of all orders and order instructions is critical. If using voice orders, records will not be as complete as if there is a paper trail of the order with instructions. NAA recommends having all orders executed and routed electronically, with a laptop with wireless connection to the OMS/EMS to serve as back-up in the event of a disaster or network failure.

IBOR Requirement

An Investment Book of Record (IBOR) is a centralized data repository that has a number of cash and position management capabilities and is updated throughout the day as trading occurs. This differs from the "Settled Book of Record" and "Accounting Book of Record" as they reflect the current day's trading activity for more up-to-date position balances and informs managers of live positions before they are settled.

There are three popular choices for IBOR: build in-house, accounting vendor solution, OMS vendor solution. Each system has its strengths and weaknesses, and for this specific project NAA recommends that outsourcing the IBOR along with middle/back office functionalities (accounting vendor solution) makes the most sense from a cost, and time and effort perspective.

Creating an in-house IBOR requires data quality, accuracy, and timeliness of the back office to be sufficient to service front office needs. The system is built upon querying the portfolio accounting system at timely intervals and overlaying real-time data from the OMS to generate positions and applying that to a valuation model for return and risk metrics generation. If LACERA outsources its middle/back office responsibilities, building an in-house IBOR is prohibitively difficult.

An OMS-based IBOR requires loading of positions and NAV at the start of the trading day. Intraday trades are added to the positions held, providing an IBOR. The difficulties that arise are: inability to handle global trading; no risk measures; attribution limits; can't reconcile IBOR with back office. Global trading cannot be handled because Asian markets positions will need to be loaded while the US is still trading, US positions when Europe is trading, and European positions when Asia is trading. Keeping positions consistent across day-roll, accounting for corporate actions while ADRs are actively trading is very difficult. As the positions are loaded every day, there is no history – which affects attribution and risk models.

An accounting-based IBOR integrates with the trading system and feeds it trades, new securities, and market data. NAV and positions are pretty accurate and historic positions are available. There can be issues in futures/options settlement (cash vs. physical), so it's best to figure that out ahead of getting into positions. If LACERA is outsourcing middle/back office responsibilities, usually the vendor will provide an IBOR service or option as well.

In terms of regulatory requirement, an IBOR is *not required*. While not required, an IBOR helps to facilitate transaction reporting with regulators as well as support trade desk oversight functions such as position limit monitoring and substantial shareholder reporting.

Given LACERA has one client, one custodian, and quarterly rebalancing - a complex solution built for separately managed accounts, multiple custodians, and daily trading is not needed. It may be sufficient to use Excel spreadsheets on top of the accounting book of record (ABOR) for the IBOR. Also, based on the OMS provider selected, it may be sufficient to build an IBOR solution off the OMS positions.

SWIFT Connectivity

SWIFT is currently the most commonly accepted communication protocol between financial institutions with its ISO messaging, which provides the communication infrastructure for the global financial system. While there may be alternatives, SWIFT is currently the accepted standard.

FIX announced plans in early 2019 to introduce the FIX messaging protocol into back-office settlement workflows, but recently there has been no news on the matter.

Will look to discuss with LACERA further regarding use of SWIFT and selecting an appropriate "message package". Cost estimates of $25,000 for installation, software, hardware, and integration; cost estimates of $15,000 for recurring fees. The total cost for SWIFT integration is $40,000.

Physical versus Synthetic Replication

Physical replication involves holding the underlying securities or assets of the benchmark index whereas synthetic replication involves the use of futures, options, and swaps to replicate the return of the benchmark index without actual ownership of the underlying securities. There are advantages and disadvantages of both methods, which are described below.

The advantages of physical replication are: beneficial ownership of holding the equity; transparency; incremental income; and limited counterparty risk.

Through holding the physical security, LACERA receives the benefits of ownership such as proxy voting, shareholder advocacy, and corporate governance. Through these benefits LACERA can influence corporate objectives in the context of the social, regulatory, and market environment.

Compared to derivatives, owning equity is more transparent as equity represents ownership in a corporation. Derivatives are products of financial engineering that have values based on other assets and can be harder to value.

Incremental income can be generated through participation in a securities lending program. Securities lending is an investment activity where the owner or beneficial owner of the securities loan the securities and earns income through loan fees. Through this program the beneficial owner maintains the ability to sell at any time though voting rights are waived when the securities are being lent. The income generated from a securities lending program for a large pension plan allocation can be substantial.

Compared to derivatives which can have counterparty risk, equities have virtually no counterparty risk as they are exchange traded.

The disadvantages of physical replication are: transaction costs; time-intensive; reputational risk arising from holding individual names.

Through building a portfolio from individual names of varying liquidity, transaction costs are usually higher for physical replication compared to synthetic replication. Compared to derivatives which can be traded at the index-level, physical replication has to be handled at the individual name level, resulting in more work and time spent managing the portfolio. For example, dealing with corporate actions (e.g. dividends, spinoffs) is a daily responsibility in that holding cash or spun off companies no longer in the index may impact the returns of the overall portfolio. Reputational risk involves difficulties arising from negative news regarding companies or individuals within companies, such as ESG issues or CEO misconduct. The negativity may become associated with LACERA as it is a portfolio position.

The advantages of synthetic replication are: a light technology lift and team responsibilities; the ability to generate incremental returns; avoiding reputational risk of holding individual names.

By not holding the underlying securities, monitoring and maintaining the portfolio requires less effort versus other replication methods. Complex processes such as weighting, corporate actions, risk and exposures can all be done at the index level as opposed to the individual name level. On a daily basis, most processes can be automated or streamlined so that the manual operations by the Investment team will largely be reduced to the monitoring of corporate actions as they relate to cash flow issues (e.g. dividends, dividend forecasting). The portfolio can also generate incremental returns on the collateral through maturity (via floating paper) duration and credit management.

The disadvantages of a synthetic replication method are: basis risk; counterparty risk; taking physical delivery.

Basis risk is the risk of derivatives prices deviating from their tracking index. If this occurs in a portfolio, synthetic replication may become more expensive than other replication methods or fail to generate the returns of their tracking index. Similar to tracking error, basis risk can influence performance positively or negatively, whereas transaction costs are always negative.

Counterparty risk represents the risk that the other party to a financial contract does not meet its obligations. For futures this risk is very low due to the clearing house of the exchange acting as the counterparty as well as daily settlement, but for swaps the risk can be higher. To mitigate swap counterparty risk, many contracts reset the swap (i.e. mark-to-market) on a daily basis in an effort to maintain zero daily counterparty exposure.

In the case of contract expiration and a cost-prohibitive rollover, counterparty contract breach, or similar extraordinary event - NAA recommends taking physical delivery versus cash settlement, meaning the counterparty is required to deliver the benchmark index constituents. This requires LACERA to have the infrastructure ready to accept delivery – which results in a higher upfront investment and continual maintenance.

Based on the structure of LACERA and its funds, the goals of the firm, and the advantages of beneficial ownership – NAA recommends the use of physical replication over synthetic replication for the passive management of the US stock index portfolio.

Replication Methods and Redemption

LACERA may sell portions of its portfolio during rebalancing and use the proceeds for purposes such as paying member benefits. It makes sense to liquidate the passive strategies first, as active and factor strategies are more sensitive to shifts in time horizons. For certain replication strategies, selling a portion of the passive US portfolio might be difficult or create exposures that are undesirable. Effects and remedies are covered below.

Full replication is buying all the securities in the index in the same exact weight as the index. For full replication, the process is relatively straight forward – sell off shares in the same proportion as the index to generate the cash needed. Usually the cash needed will not be significant enough to generate liquidity concerns when selling the individual names.

Partial replication is buying the securities in an index that provide the most representative sample of the index based on individual security attributes. For partial replication, there are many methods to sell off a hybrid portfolio. One method is to consider optimizing a new portfolio with current day exposures and funds less cash needed. The downside of this is that it might generate significant turnover and not follow a set schedule. Another method is to sell off the most liquid names first and wait for the next scheduled rebalance to optimize. This method introduces risks and exposures that will result in performance and volatility differences from the benchmark index. A possible solution is to consider both methods and weigh the impact of an impromptu rebalancing with the potential costs of waiting until the next rebalance, and go with the less costly method.

Hybrid replication is buying the securities in an index and/or engaging in derivatives contracts to imitate the returns of the index based on correlations, exposure and risk. Hybrid replication has the same issues as partial replication. The benefit of hybrid replication is that a portion of capital can be invested in liquid instruments such as index futures and options. Generating cash through selling of index futures and options maintains risks and exposures to the benchmark with minimal liquidity penalties.

NAA's recommendation is an overall partial replication through dividing the portfolio into two parts utilizing both full replication and partial replication methods; one part being the "buy-and-hold" portion and the other being the "potential sale" portion. The split between the two portions will be LACERA's estimated rebalancing adjustment. Assume the anticipated rebalancing adjustment of the portfolio for next year is 10%. The "buy-and-hold" portion (90%) of the portfolio can use full replication as it is not expected to be sold under normal conditions and thus will only incur one-way transaction costs when buying. The "potential sale" portion (10%) of the portfolio can utilize partial replication focusing on maintaining liquidity in the tail end as round-trip transaction costs will be incurred given this portfolio will be bought and sold.

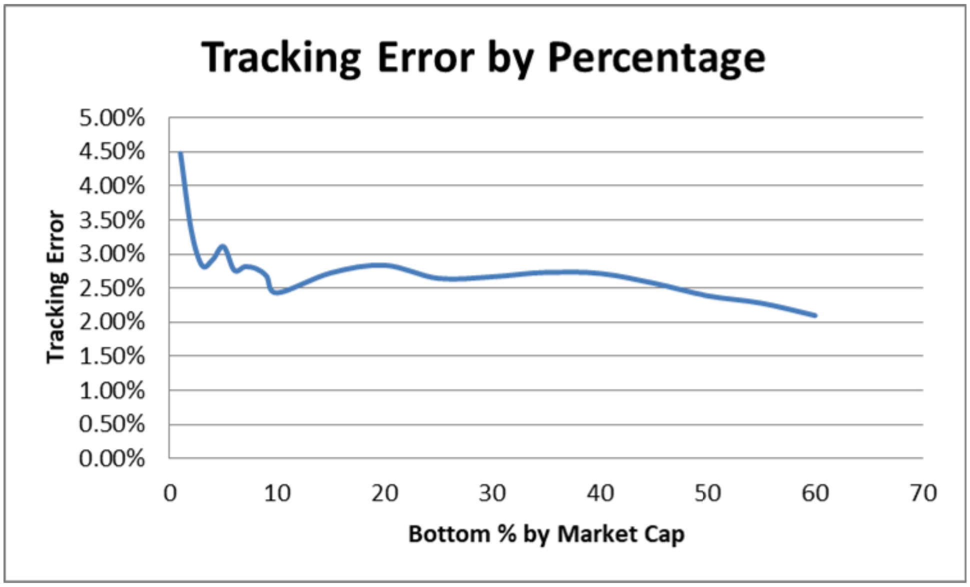
Liquidity in the Bottom Names

In comparison to a full replication, this section considers partial replication where the bottom percentage of securities by market cap is replaced by a small cap index, in this case the Russell 2000 index.

Below is a table of the statistics of the bottom percentages of the MSCI USA IMI index by market cap. Constituent and weights based off data from 02/03/2020 with a trailing-twelve-month, month-end price history for the tracking statistics.

Bottom %	Count	% of Index Market Cap	Tracking Error	Tracking Difference
1	25	0.02	4.48%	-2.87%
2	50	0.04	3.36%	-2.80%
3	75	0.06	2.83%	-2.61%
4	100	0.08	2.92%	-2.58%
5	125	0.10	3.11%	-2.37%
6	150	0.13	2.76%	-2.16%
7	175	0.15	2.82%	-2.08%
8	200	0.17	2.79%	-1.81%
9	225	0.20	2.68%	-1.78%
10	250	0.23	2.43%	-1.60%
15	375	0.38	2.72%	-1.39%
20	500	0.57	2.84%	-1.17%
25	625	0.82	2.64%	-1.26%
30	750	1.12	2.67%	-1.23%
35	875	1.51	2.73%	-1.25%
40	1000	1.99	2.72%	-1.24%
45	1125	2.59	2.57%	-1.02%
50	1250	3.34	2.39%	-1.02%
55	1375	4.25	2.28%	-0.97%
60	1500	5.36	2.10%	-0.96%
Russell 2000	2,021	15.10	1.28%	-0.76%

It is worth noting that the bottom 60% of the index only accounts for 5.36% of its market cap. The tracking error of the bottom percentages is high and gradually declines as the percentage of the index increases and averages around 2.79%.



To get a sense of the tracking error and difference with partial replication, portfolios are created using the Russell 2000 index in place of the bottom percentages of the MSCI USA IMI index and the statistics are shown below:

Bottom %	Tracking Error	Tracking Difference
1	0.00%	0.00%
2	0.00%	0.00%
3	0.00%	0.00%
4	0.00%	0.00%
5	0.00%	0.00%
6	0.00%	0.00%
7	0.00%	0.00%
8	0.00%	0.00%
9	0.00%	0.00%
10	0.00%	0.00%
15	0.01%	0.00%
20	0.01%	0.00%
25	0.01%	0.00%
30	0.01%	0.00%
35	0.02%	-0.01%
40	0.02%	-0.01%
45	0.02%	-0.01%
50	0.02%	-0.01%
55	0.04%	-0.02%
60	0.04%	-0.02%

The tracking error and differences are minimal, even if the bottom 60% of the index is replaced with the Russell 2000 index. This makes sense as only 5.36% of the index is being replaced with a very similar portfolio of securities, and the tracking difference between the bottom 60% of the index by market cap and the Russell 2000 index is 0.93%, which is small.

To get a sense of cost savings from liquidity, transaction costs savings can be compared to the tracking difference. Assuming transaction costs of 1% for microcaps and 0.5% for small caps - the smallest 250 names will be considered microcaps and have a blended cost until the smallest 750 names, where the small cap transaction cost will be used.

Using $60 billion as LACERA's total fund value, a 35% target equity allocation, an assumption of 60% passive management and a US/non-US split similar to the MSCI ACWI IMI, the passive US equity target allocation is approximately $7 billion dollars.
Using a $7 billion dollar US equity portfolio AUM and an average turnover of 2.4%, the annual estimated transaction costs are below:

Bottom %	% of Index Market Cap	Transaction Cost (%)	Annual Transaction Costs ($)
1	0.02%	1.00%	659.90
2	0.04%	1.00%	1,321.49
3	0.06%	1.00%	2,006.26
4	0.08%	1.00%	2,708.16
5	0.10%	1.00%	3,437.28
6	0.13%	1.00%	4,200.67
7	0.15%	1.00%	4,998.00
8	0.17%	1.00%	5,831.28
9	0.20%	1.00%	6,702.86
10	0.23%	1.00%	7,604.35
15	0.38%	0.88%	11,149.66
20	0.57%	0.75%	14,409.11
25	0.82%	0.63%	17,129.70
30	1.12%	0.50%	18,809.95
35	1.51%	0.50%	25,290.72
40	1.99%	0.50%	33,377.40
45	2.59%	0.50%	43,484.95
50	3.34%	0.50%	56,036.74
55	4.25%	0.50%	71,340.19
60	5.36%	0.50%	90,072.19

As the percentages of the overall portfolio are relatively small, the transaction costs remain small as well. Below is the table combining the transaction costs with the tracking difference to find the net differential of replacing the bottom percentages of the index with the Russell 2000 index.

Bottom %	Annual Transaction Costs ($)	Tracking Difference ($)	Net Difference ($)
1	659.90	-1.36	658.54
2	1,321.49	4.89	1,326.38
3	2,006.26	-2.56	2,003.70
4	2,708.16	-3.00	2,705.16
5	3,437.28	-17.21	3,420.07
6	4,200.67	-32.82	4,167.86
7	4,998.00	-15.07	4,982.93
8	5,831.28	-79.38	5,751.90
9	6,702.86	-39.52	6,663.34
10	7,604.35	-95.26	7,509.09
15	11,149.66	-676.37	10,473.29
20	14,409.11	-1,528.98	12,880.12
25	17,129.70	-1,656.93	15,472.77
30	18,809.95	-3,702.89	15,107.06
35	25,290.72	-5,681.57	19,609.15
40	33,377.40	-9,867.71	23,509.69
45	43,484.95	-26,104.68	17,380.27
50	56,036.74	-28,635.59	27,401.15
55	71,340.19	-48,922.21	22,417.98
60	90,072.19	-70,104.74	19,967.45

For the bottom percentages, the effect of gaining the liquidity of the Russell 2000 is positive. As the percentages increase, the tracking difference is more than made up for by the transaction cost savings. It is worth noting that tracking error and tracking difference can influence performance positively or negatively, whereas transaction costs are always negative.

NAA recommends using liquidity-focused partial replication methods on portions of the portfolio that may turn over frequently, such as the "potential sale" portion of the portfolio. For example, the tracking error and tracking differences of a bottom 10% replacement with the Russell 2000 index are very minimal and can save on transaction costs.

Benchmark Comparison

There are a number of benchmark indexes for broad market US equities, including: MSCI USA IMI, MSCI US Broad Market, Russell 3000, S&P 1500, and Wilshire 5000. Though each index differs by construction methodologies and rebalancing schedules, further analysis, not shown here, finds when comparing the index constituents, market cap statistics, tracking error, tracking difference, and estimated transaction costs over a 5-year period (2015-2019) shows that statistically the indexes are not substantially different from each other.

The MSCI USA IMI index is a component of the MSCI ACWI IMI index, which is LACERA's global equity benchmark. Based on benchmark comparison analysis, the MSCI USA IMI index has the lowest tracking error with the target benchmark of the US portion of the MSCI ACWI IMI as well as modest implicit transaction costs due to lower annual turnover compared to its peers.

Therefore, NAA recommends that LACERA use MSCI USA IMI as the benchmark for the US passive strategy. LACERA can work with the existing passive index provider to implement the passive strategy.

Internal Management Knowledge Transfer

A goal of this project is to assess how LACERA can build expertise in the internal management operation of assets. The processes and responsibilities involved can be broken up into different segments, namely the front office, middle office, and back office. Specifics about these segments are discussed later in this report, but in general the front office responsibilities are usually more discretionary compared to the middle and back office responsibilities, which are more procedural.

Based on the analysis of the structure of LACERA and the experience of its staff, NAA recommends an initial focus on building out the front office capabilities and expertise internally and then focusing on middle and back office responsibilities. This recommendation is based on: current skills and experience, time-to-market, and value added.

The skills and experiences of the Investment team broadly cover the front office responsibilities for the internal passive management of US equities. The key areas of portfolio creation and management, trading, risk management, and attribution are covered by multiple staff. The Investment team serves as a solid foundation for expansion into different markets and regions and new hires can be added to address any gaps in coverage or skills.

The General Accounting and Investment Accounting teams within LACERA cover portions of the middle and back office responsibilities for internal management, but not all. New processes and procedures will need to be prepared (see "Internal Middle/Back Office" section below for more details) before a functional minimum viable product can be used and new staff will almost certainly have to be hired to oversee responsibilities such as keeping abreast of regulatory changes and its effect on policies and procedures.

For time-to-market, NAA predicts an 18-month build to live trading based on the recommended scenario, which includes internal trading and outsourced middle and back offices. The time to setup all the front office systems to live trading is estimated to take fourteen months and the time it will take to setup an internal middle and back office system is estimated to take longer than that. Steps for internal middle and back office system setup include hiring and training staff, update of current accounting systems to accommodate internal management, additional processes to support front office functions and regulatory reporting requirements, and integration with the front office – an estimate of an additional twelve months is required to setup a minimum viable internal middle and back office.

The value added of building expertise in front office functions benefits in many ways. Building expertise in discretionary responsibilities allows LACERA to incorporate new ideas and research into value added decisions for the benefit of its members. For example, through reading a research report the trading team decides to incorporate a new order type and execution methodology which saves 5% on quarterly rebalance costs. The Investment team can also review performance of exterior managers with a keener eye, being able to better decipher the manager's performance.

The internalization of the middle office is a long-term solution and is something to be explored as the systems are up and running smoothly. A benefit of waiting to gain knowledge in the middle office functions is that it allows the front office team to figure out preferences in middle office functions, which can be built to specifications when internalized. Furthermore, the outsourced middle office can serve as a model to build upon, which is very useful given the current teams within LACERA might not have sufficient knowledge and skills to build an operational middle office. Finally, with the possible expansion of asset classes and regions, it might be better to wait to build an internal middle office until those are live. For example, building a process to handle global equities will be easier when familiar with the idiosyncrasies of having different positions in different markets trading at different times.

NAA recommends examining internalization of the middle office can be after the completion of internalizing the passive management of the emerging markets portfolio. Incorporating other regions and running rolling reports based on opened/closed markets will be the most complex lift procedurally, structurally, and systematically. Incorporating other asset classes such as fixed income will be easier. By that point, the economies of scale should favor an internalization process as well.

Recommendation Components

Full Replication of the benchmark index with considerations for liquidity in rebalancing

Full replication is buying all the securities in the index in the same exact weight as the index. This method is common for large and liquid indexes, such as the MSCI USA IMI.

The advantages of full replication are that it is: simple to explain; easy to track/monitor; performance nearly identical to index.

Explanation of a full replication approach is straightforward and may help allow non-financial background parties to better understand the efforts of the Investments team. Tracking and monitoring is relatively straight forward, paying attention to corporate actions, rebalances, and cash management are the major tasks for maintaining a full replication index. Since the portfolio is holding the same securities at the same weights as the index, performance will be very similar to the index.

The disadvantages of full replication are that it is subject to: liquidity concerns for certain securities in the index; higher transaction costs; cash drag.

For the smaller market cap or lower trading volume names within the index, liquidity might become a concern when entering and exiting positions. For example, the smallest market cap security in the MSCI USA IMI index has a market cap of 18.35 million dollars and trades an average dollar amount of $70,000 per day. In general, such concerns shouldn't be too large for the benchmark index - though prudence should still be exercised, especially in names around the lower-bound cutoff.

Transaction costs will be greater than alternative methods due to forced trading around lower liquidity names during rebalancing. Also, there will be higher commission totals arising from the reinvestment of dividends. If dividends are not reinvested in a timely manner, the cash in the portfolio may approach the limit specified within the mandate and will negatively affect the performance of the portfolio as it does not generate any return.

Through the analysis in the "Liquidity in the Bottom Names" section above, considerations can be made to reduce transaction costs – especially in the portion of the portfolio that will be rebalanced. NAA recommends breaking the overall portfolio into two sections – a "buy-and-hold" section and a "potential sale" section, with the "buy-and-hold" section utilizing full replication and the "potential sale" section utilizing partial replication focusing on liquidity and minimizing transaction costs.

Summary:

Advantages:

- Simple to explain
- Easy to track/monitor
- Performance nearly identical to index

Disadvantages:

- Liquidity concerns for certain names
- Higher transaction costs
- Cash drag

Using $60 billion as LACERA's total fund value, a 35% target equity allocation, an assumption of 60% passive management and a US/non-US split similar to the MSCI ACWI IMI, the passive US equity target allocation is approximately $7 billion dollars.

An EDHEC study shows that the annualized transaction costs for a cap-weighted universe of 3,000 securities averages around 0.05%. With a 5-year average turnover of 2.4% for the MSCI USA IMI index, the estimated transaction costs for full replication of the benchmark index is estimated to be around $165,200.

Outsourcing Middle and Back Office

Middle office functions include technology, compliance, law, and risk management. Back office functions include settlement, clearance, collateral management, record maintenance, accounting, human services, and regulatory/organizational compliance. NAA believes internalization of middle and back office functions may be a good long-term solution, but the time requirements for building and initializing the processes may not fall within the timeline to stand up the overall project. Thus, NAA recommends an initial outsourcing of the middle and back office functions.

There are teams within LACERA that could handle the middle and back office duties, though based on initial discussions it appears as though a moderate build would be required (more details in "Internal Middle Office and Trading" in the Scenario section) to support the middle and back office functions for internalization of assets. For example, the Investment Accounting team does not have experience with post-trade processing and manual entry would likely create settlement process errors.

NAA recommends outsourcing the middle and back office due to: focusing on discretionary processes and outsourcing procedural processes; minimizing execution risk; talent and scalability; cost savings.

Most middle and back office functions are procedural processes. Devoting time and effort of LACERA's current project team to these tasks would be an inefficient allocation of resources. Having the team focus on the discretionary aspects where the team has expertise would be a better allocation of time and talent.

Developing an internal middle and back office solution would heighten the execution risk of the overall completion of the project, as LACERA would be building new systems that would require testing and integration. Unknown unknowns will likely be encountered throughout the course of the integration that could delay or negatively impact the successful completion of the project. Using an outsourced vendor with expertise, experience, and integrated solutions will significantly reduce the execution risk of the project. For example, LACERA is currently undergoing a revamp of its overall business continuity plan. To build an internal system for business continuity and disaster recovery while still figuring out the details would pose a risk of delay of standing up a system that conforms to new standards once published. Outsourcing to a vendor with best-of-breed practices would be a better choice initially, and choosing a vendor that can adapt practices to new standards once implemented will allow a more seamless transition.

Possessing and maintaining top talent in middle and back offices is a costly exercise. For example, the acceleration of regulatory changes (e.g. General Data Protection Regulation (GDPR) and SEC modernization rules) requires skill sets that may not be in-house and searches for these skills are in high demand, thus commanding a premium. Outsourced middle and back offices will have immediate access to a broad range of subject matter expertise (e.g. regulatory expertise). Scalability is easier with outsourced functions as well; for example when exploring global markets, requesting a sit-down with the vendor on the regulatory environment in a specific market and how to integrate it into reporting is much easier than having to source the information internally or hiring talent to do so.

Outsourcing middle and back office functions is cost-efficient as payment is only for services needed. Staffing, software and technology packages, business continuity and disaster recovery services, and one-time initiative (e.g. new market launch, T+1 settlement) can all be customized based on need and represent a more efficient and flexible use of funds versus an internal build.

The disadvantages of outsourcing the middle and back offices are: not all risk is transferred to vendor; possible concessions in functionality; may not end up cheaper; may be difficult migrating in the future.

If a purpose of outsourcing the middle and back office functions is to mitigate risk, outsourcing will not eliminate all of the risk. Even if outsourcing administration, the fiduciary is still LACERA. It is still imperative that LACERA understands the intricacies and nuances surrounding the middle and back office functions, especially when engaging in derivatives and complex products. If errors do occur, LACERA needs to be cognizant of the vendor's conflict resolution policy and the limit of recourse, which may be capped to the annual fee paid to the vendor.

The functions that LACERA would like to have in place for middle office and back office operations may not be ready and available at the go-live date. Some functions may need to be deferred to get the platform up and running faster. These functions could span something as simple as an operational report to a full module.

Though only choosing services needed should result in cost savings, this may not always be the case. Choosing desired services may end up having a higher total cost than having an internal system. For the most part, vendors are flexible in providing a solution that is initially cost-effective but it remains that diligence is required in considering initial and long-term costs. Of course, outsourcing may be viewed as an initial step with internalization the ultimate goal as the program achieves scale.

In choosing to outsource middle and back office operations, LACERA is also selecting the vendor's data items, storage framework, and methodologies. If, in the future, a new vendor is selected or operations are internalized, the migration of data will be subject to the constraints and limitations of the vendor's data structure and policies. Usually vendors are flexible with respect to structures and formats when migrating data, but it may become a pain point in the future. Protective provisions for data and data structure access should be negotiated into the initial agreement (e.g. LACERA owns the data).

Summary:

Advantages:

- Focus of time and talent
- Minimizing execution risk
- Talent and Scalability
- Cost Savings

Disadvantages:

- Still have risk exposures
- Service concessions
- May not end up cheaper
- May be difficult to migrate in the future

NAA is currently in the process of talking with various vendors to get quotes for outsourced middle and back office responsibilities. One mid-tier vendor has quoted a cost of $2,200 per month for basic middle and back office services with an implementation fee of $5,500. The total cost of the vendor solution for outsourcing middle and back office services is $31,900. NAA is still awaiting quotes from top-tier vendors.

Internal Trading

This scenario involves building the trading team within LACERA. The Investment team has considerable experience trading in equities and should be able to internalize the trading responsibilities – such as trading, trade analytics, reporting, and research - for US equities without major issue. Expansion to global equities and other asset classes may be new territory for the team and require more resources in the future.

The advantages of internal trading are: communication and speed; aligned interests/priorities; maintaining control; synergistic effects with other portfolios.

By building the trading system internally, LACERA can get orders to the market faster than with an outsourced trading team. As the Investment team will act as both PM and trader, once desired positions are created via the OMS they can be entered into the EMS and sent for execution. In contrast, there's a physical and communication gap between the PM and the outsourced trading vendor. This delay also applies to trade instructions, such as order modifications. The interests and priorities are aligned as the trader is internal to LACERA, such as fiduciary responsibility to the clients and keeping proprietary information confidential. As the internal trading team only has one client, LACERA, the team is able to maintain control over orders and priority of execution, especially in times of market volatility – in contrast to an outsourced trading vendor which services multiple clients.

As the internal trading team gains familiarity with the processes, analyses, and market color, the team can utilize these skills to review and monitor other mandates in similar markets. For example, if an active manager in the same market has similar turnover as the passive portfolio but the manager's reported transaction costs are much higher, the internal trading team can conduct a review to get a sense of the quality of execution and management.

The disadvantages of internal trading are: operational risk; scalability.

Having an internal trading team involves operational risk such as having to manage events such as holidays, vacations, unplanned absences, and overnight trading. Scalability issues may arise as the team enters into more markets; managing the trading may become too much for the team to handle and may require hiring new staff and/or new technology/infrastructure.

For the internal management of the passive US equity portfolio, NAA does not see the need to add staff to the Investment team to conduct trading. For costs estimates, on average it takes two analysts one day per week for trading responsibilities and two managers one day every other week to oversee trading. Furthermore, on average, one week per quarter will be required for trading review and oversight by both analysts and managers.

Building the trading operation will take approximately 18 months and require on average two analysts an extra two days per week and two managers an extra day per week to oversee the build.

Timeline Categories

The internalization of the passive US equity index strategy will take approximately 18 months to build and test before live trading commences. The tasks and processes will be divided into the following broad categories:

Technology Architecture Build: Network; servers, security; automation; backup & data continuity.

Outsourced Vendors: Define needed services; identifying vendors; vendor review; contract negotiations; onboarding and integration.

Operational Infrastructure: Define modules (portfolio strategy, risk management, performance attribution, trading, paper portfolios, deployment & monitoring, middle & back office); identify vendors, systems, and processes for each module; Vertical integration of the modules;

In addition to these broad categories, a considerable amount of time will be devoted to setting up systems and processes, integration, calibration, testing, troubleshooting, and refinement of the systems and processes before the strategy goes live. Many systems will be newly developed for this project and so rigorous testing and quality assurance processes will be required.

A detailed timeline for the internalization of the passive US equity index strategy is provided on page 50.

Recommended Infrastructure Build

Item	Notes	Vendors
Data		
Index Constituent Data	Global index/benchmark constituents, daily returns, and benchmark characteristics	Current Providers
Market Data	Daily price data	Current Providers
Reference Data	Two providers as a crosscheck and backup for corporate actions	Current Providers
Modules		
Portfolio Management System	Software/system to build, analyze, optimize portfolio	Current Providers, OMS
Risk System	Model/system used to monitor and assess past, current, and future portfolio exposures	Expand Current Relationships
Performance Attribution	Software/system used to monitor and assess portfolio and trading performance	Current Providers, Expand Current Relationships
Trading & Operations		
Middle & Back Office	Outsourced. IBOR, collateral, post-trade processing, settlements	Expand Current Relationships, Establish New Relationships
OMS/EMS	Integrated OEMS or separate	Expand Current Relationships, Establish New Relationships
Trading	Order execution, trade analytics, reporting, and research	Internal

Recommended Infrastructure Build Cost

Item	Cost	Notes
Data Costs		
Index Constituent Data	$55,000	Incremental cost of constituent data for internal management of assets
Market Data	-	No incremental fees from current subscriptions
Reference Data	-	Included in market data fees.
Technology		
Technology Infrastructure	$5,175	Servers, connections, system build
SWIFT Integration	$40,000	Installation and integration, messaging fees
Portfolio Management System*	-	Current providers, OMS
Risk System*	-	Expand Current Relationships
Performance Attribution*	-	Current providers, Expand Current Relationships
OMS/EMS	$60,000	Estimated quote of $60,000 for 3 full access users and includes market data
Trading & Operations		
Middle & Back Office	$31,900	Estimated mid-tier vendor quote. Awaiting top-tier vendor quotes.
Trading Commissions	-	
Internal Trading Operations	-	No additional hires
Total	**$192,075**	
External Costs	$700,000	Passive management of $7 billion at 1bp fee
Total Savings	**$507,925**	

The costs are estimates and are not guaranteed
**Costs incorporated into other systems*

The total cost of building the internal US passive management operation is estimated to be **$192,075**. This cost estimate is an incremental cost and leverages data, software, subscriptions, systems and processes already used by LACERA. Based on median passive US equity management fees for large pension plans of 1 basis point per dollar of AUM, the cost of outsourced management for the benchmark index is $700,000 per annum.

Business Continuity

In the event of an investment-related crisis, LACERA's ability to effectively monitor or manage the Pension Fund's assets may be interrupted or impaired. This document covers the methods for the LACERA Investments staff to continue operations of the Investments division through the crisis until a return to normal.

The rest of the document is as follows: list of assumptions made in continuing operations during a crisis; dividing crisis severity into tiers based on the availability of resources to the LACERA Investments staff; list of infrastructure measures to be in place to ensure successful operations during a crisis; responsibilities of vendors and LACERA staff during a crisis.

Assumptions

- Infrastructure is setup to have access to work related systems and data files needed to carry out daily operations offsite.
- Established secure connection method to internal servers and work systems with access protocols and adequate telecommuting resources (computers, internet connection, remote access) for LACERA Investments staff.
- Email access will remain available throughout the crisis.
- Vendors (data, software, services) will continue to provide services in line with their contractual obligations throughout the crisis and be in communication with LACERA Investments staff throughout the crisis.
- Crisis response levels can be captured by a tiered system depending on availability of resources to the LACERA Investments staff

Crisis Tiers

- **Normal Use**: On-site access, usual access points for data/services available.
- **Crisis Tier 1**: No on-site access, usual access points for data/services available.
- **Crisis Tier 2**: No on-site access, usual access points for data/services not available, internal server access available.
- **Crisis Tier 3**: No on-site access, usual access points for data/services not available, internal server access not available, remote/cloud server available.

Infrastructure

- <u>Data</u>
  - Daily download of data to internal servers, even if data is used in vendor software or other program (e.g. download pricing data from vendor).
  - Weekly backup of data from internal servers to remote/cloud server.
  - In days of significant activity (e.g. rebalancing) or above a certain threshold, backup to remote/cloud server.
  - Assuming LACERA uses only one custodian bank, a weekly remote/cloud backup is sufficient. If multiple custodian banks, a daily remote/cloud backup would be preferred to save from rebuilding the position book across multiple custodians in case of a Tier 3 crisis.
- <u>Access</u>
  - Ability to access work related systems, internal servers, and remote/cloud server from outside the office
    - E.g. Remote desktop / VPN from LACERA staff's personal computer or company-issued laptop with wireless connection
  - Vendor services are able to be accessed. If not, backup systems are ready
    - E.g. can remotely connect to vendor platform for portfolio positions
  - Connection is secure
    - E.g. 2-factor authentication for remote connections
  - Data retention policies and procedures for remote work are in place
    - E.g. if downloading trade data to personal PC at home, purge once task is completed or all work has to be done within the remote desktop - cannot download to personal PC.

Vendors and LACERA Responsibilities

- <u>Vendors</u>
  - The vendor should be expected to continue providing their service as stated in the services agreement with LACERA.
  - If services are interrupted, alternative delivery methods and processes should be considered (e.g. email delivery if platform access is down).
  - Should the vendor not be able to provide contractual services, prompt communication outlining the issue and expected resolution time should be expected.
- <u>LACERA</u>
  - LACERA should be prepared to ingest the vendor data through alternative methods should the primary method not be available.
    - E.g. if building an IBOR off positions downloaded from the portfolio management system software and platform access is unavailable, the positions can be sent via email from the vendor or bootstrapped off a backup of the previous day's portfolio positions and overnight trade reports.
  - LACERA should be prepared to utilize alternative methods should primary vendor services not be available.
    - E.g. if OMS/EMS is unavailable, LACERA should have an "order crash kit" – a template to fill out with order instructions and send to the broker via email/fax in order to facilitate trading. This should be familiar to both LACERA and the broker as to prevent communication errors.
    - E.g. Excel models for calculating performance attribution or TCA
    - E.g. Internal servers with databases of market and reference data history
  - A decision approval process should be in place so that the communication, decision, and implementation procedures are unambiguous.
    - E.g. Defining a crisis response group and crisis response plan
  - LACERA should consider conducting an annual test of the tiered crisis responses to assure a smooth transition should a crisis occur.

- Crisis response processes and procedures should be memorialized in a document (and included in the overall LACERA business continuity plan if that makes sense) and circulated to the appropriate employees.

Scenarios

<u>Replication</u>

The alternatives for replication of the MSCI USA IMI index are: Partial Replication and Hybrid Replication.

Partial Replication

Partial replication is buying the securities in an index that provide the most representative sample of the index based on individual security attributes. This is accomplished through measuring various attributes of the securities within an index and optimizing a subset of index securities to exhibit the same characteristics of the index. Examples of security attributes are liquidity, correlations with other securities/index, exposures and risk.

The advantages of partial replication are that it is: costs less to implement; flexibility in defining replication parameters.

Because of the optimization of attributes, LACERA can filter out the more costly-to-trade securities and still build a portfolio with the same exposures as the index. This allows for a cheaper implementation and thus cost savings. Also, through attribute selection and optimization parameters, LACERA can be flexible in choosing which exposures are important and/or will be rewarded in tracking the Broad Market US index, allowing for return improvement or better risk control.

The disadvantages of partial replication are that it is subject to: Tracking error and difference; added complexity.

Not holding all the index securities at the same weight as the index introduces tracking error and tracking difference. In partial replication, performance might lag (tracking difference) or returns may be more volatile (tracking error) compared to the benchmark. Due to attribute selection and optimization, the implementation becomes more complex, which increases execution risk as well as becoming more difficult to explain to a non-finance background audience.

With partial replication costs being dependent on methodologies used and attributes selected, the costs will be more variable but should be lower. See the above section "Liquidity in the Bottom Names" for a thorough example. For a replacement of the bottom 10% of the MSCI USA IMI with the Russell 2000, an estimated $7,604.35 can be saved in transaction costs on a portfolio of $7 billion AUM.

Hybrid Replication

Hybrid replication is buying the securities in an index and/or engaging in derivatives contracts to imitate the returns of the index based on correlations, exposure and risk. This methodology is similar to partial replication in that it uses individual security attributes and optimization to create a portfolio.

Hybrid replication expands upon partial replication by incorporating in the use of derivatives such as options, futures, and swaps.

Future: a derivative financial contract giving the buyer an obligation to buy (and the seller an obligation to sell) an underlying asset at a predetermined future date and price.

Option: a derivative financial contract giving the buyer (owner or holder of the option) the right, but not the obligation, to buy or sell an underlying asset at a predetermined future date and price (strike price).

Swap: a derivative financial contract between two counterparties to exchange the cash flows or value of an underlying asset for another.

There are many options to replicate the return of the benchmark index through synthetics:

- Futures:
    - US Mini MSCI USA futures from ICE
    - E-mini Russell 1000 and 2000 futures contracts from CME
    - E-mini S&P 500 futures from CME

- Options:
    - S&P 500 Index (SPX) options from CBOE
    - Russell 1000 Index (RUI) and Russell 2000 Index (RUT) options from CBOE

- Swap:
    - A total return swap for the performance of the MSCI USA IMI Index
        - Daily or other periodic mark-to-market

- Hybrid:
    - Combination of Futures and Swaps

The advantages of hybrid replication are that it: costs less to implement; is more flexible in defining replication parameters; uses derivatives to gain exposure or mitigate risk.

Similar to partial replication, through hybrid replication LACERA can filter out the more costly-to-trade securities and still build a portfolio with the same exposures as the index. Additionally, instead of buying the securities of the small-cap names, buying futures or options on a small-cap index may provide cheaper exposure with less work (e.g. dividend reinvestment, rebalancing). Entering a swap may also be a cheaper alternative with the ability to time outflows to meet cash needs. Selling off futures for unplanned cash needs is much more straightforward than selling off a partially replicated portfolio, as the risk and exposure profile changes in selling off names may not balance easily. If in a situation where exposure is higher than desired and stock liquidity is low, mitigating the exposure through the derivatives market may be a cheaper alternative than dumping positions into a tough market. More choices for gaining and reducing exposure allows for cheaper implementation to those exposures.

The disadvantages of partial replication are that it is subject to: Tracking error and difference; added complexity of derivatives use & management; derivatives counterparty risk.

Tracking error and difference are introduced through hybrid replication, in which performance might lag or returns are more volatile compared to the benchmark. By using derivatives, implementation complexity is even higher than partial replication as futures and options have distinct features such as expirations and counterparty risk. Though minimal for futures and options, swaps contain counterparty risk, which is the risk that the other party to a financial contract does not meet its obligations. This risk can be mitigated through methods described in the Synthetic Replication section above.

With hybrid replication costs being very dependent on methodologies used and attributes selected, the costs will be more variable but in theory should be cheaper. For an example, assume a hybrid replication portfolio using Russell 2000 futures to cover the bottom 10% of the MSCI USA IMI index outlined in "Liquidity in the Bottom Names" above. Assuming a $7 billion AUM portfolio, a 10% "potential-sale" portion of the portfolio that is liquidity-sensitive, and a bottom 10% of the MSCI USA IMI index replacement with Russell 2000 index futures, approximately $1.6 million in futures will need to be purchased.

Futures contracts are priced relative to the opportunity to earn interest on the underlying collateral (generally assumed to be LIBOR) and to the dividends earned by holding the stocks comprising the index (the cash portfolio). As an example, current market data shows that the eMini Russell 2000 futures are above fair value to the extent that the underlying portfolio of collateral would need to yield approximately 13 bp (annualized) in excess of LIBOR to breakeven with the underlying cash portfolio.

Futures contracts also need to be rolled quarterly. This involves both a commission as well as the difference in contract values. Currently, for example, this difference is also above fair value necessitating the underlying to earn one extra basis point (annualized). In total, therefore, the hurdle rate on the underlying collateral is 1.95% versus 3 month LIBOR of 1.81%. Any incremental returns above 1.95% would be considered alpha.

To note, the above calculations assume the following:

As of 1/20/2020, the dividend yield of the Russell 2000 is 1.40%, the 3-month Treasury bill yield is 1.52%, the 3-month LIBOR is 1.81%.

The front e-mini Russell 2000 futures contract (Mar20) price is 1684.8 and the deferred contract (Jun20) price is $1,686.6 and spot price is $1,684.46.

We assume 10% of the collateral will be held in 3-m T-bills for margin requirements.

Subscribing to a dividend forecast service will provide a better estimate of expected future dividends and thus provide a better forecast of net transaction costs.

Outsourcing/Insourcing

Internal Middle/Back Office

This scenario involves building the middle office and back office teams within LACERA. LACERA currently has divisions that can handle the middle and back office functions, such as: Legal for fiduciary responsibilities, contracting; Systems for technical issues and maintenance; Accounting for records handling, settlements, regulatory / compliance, and accounting; Investment team for risk management. A more comprehensive review will be required to assess the experience and skills within the teams, and specific focus should be given to the regulatory, settlement, clearance, and accounting responsibilities.

Additional internal processes will have to be created:

- Adapting current investments bookkeeping processes for multiple asset classes (ABOR)
- Syncing back office accounting systems with front office trading for IBOR
- Post-trade processing (clearance, settlement) procedures
- Daily P&L processes for multiple asset classes and portfolios
- Regulatory reporting and compliance processes
- Collateral monitoring and management processes

The advantages of internal middle/back office are: build flexibility; aligned interests/priorities; maintaining control.

Instead of being limited by a vendor's offerings, an internal system can be built to specifications with desired functionalities available day one. For example, if instead of a daily VaR metric LACERA prefers a liquidity-adjusted VaR metric on a portfolio, it can be built into the internal reporting versus the vendor having to custom build or not being able to provide such a metric. Through an internal build, LACERA has the flexibility to stand up a middle/back office at minimal cost if deemed that all the pieces are already internal and available or spend the money to hire talent and build processes needed to fill the gaps – the range of possible solutions for correct fit exceeds what a vendor can provide. As the team is internal to LACERA, team interests are aligned. A vendor might not prioritize an issue as highly as LACERA prefers or resolve it to LACERA's satisfaction, such a risk in an internal team is less likely. Control over operational decisions lie within LACERA's Systems Division as opposed to an outside vendor. For example, updates to software, system infrastructure, and technology can be planned out and executed in a manner convenient for LACERA as opposed to forced adoption by a vendor.

The disadvantages of internal middle/back office are: resource/time intensity; operational risk.

Building the desired internal system with the proper talent has the risk of being expensive and slow. For example, if Legal and Accounting are not familiar with or ready for the reporting requirements under GDPR and MiFiD II regulations at live trading - delays, penalties, and/or negative media might result. Though MiFiD II does not directly apply to US asset managers, if the asset manager does any business in the EU, the firm is required to abide by the regulations in order to continue doing business – thus it is important to be familiar with global regulations that may indirectly affect LACERA. Building these processes will take time and may not be completed within the project's time budget.

Another issue that may arise from either an internal build or extensively customizing a vendor solution is the update cycle. While industry regulations and standards are updated, systems must be updated to reflect the changes. Having custom built solutions means these continual maintenance issues must be budgeted for on an ongoing basis.

As many teams will be taking on new roles and responsibilities in the asset internalization process, there are operational risks that not all the systems and divisions will work smoothly with each other. These risks can be mitigated through checklists, reviews, communication, and practice runs.

The average middle and back office analyst salary at a large pension fund is $90,000. With a 1.25x benefits multiplier the total cost comes to $112,500. For the internal middle and back office responsibilities, one full-time hire would be needed to fill any gaps. Hiring internal middle and back office personnel will cost an estimated $112,500 annually.

Outsourcing Trading

Trading responsibilities include: trade execution; trade affirmation; trade analytics including transaction cost analysis; RPA/CCA; reports. The Investment team has considerable experience in trading equities and should be able to internalize the trading responsibilities for the passive US indexes, though this effort may not be cost effective or scalable. Expansion to global equities and other asset classes may be new territory for the team and require more resources.

The advantages of outsourced trading are: improved execution performance; talent, access, and scalability; cost savings.

An outsourced trading vendor usually provides improved execution performance compared to internal teams. Most vendors have access to broader parts of the liquidity spectrum compared to a fund's agency broker, including access to the agency broker itself. Vendors also get market color from their many clients and may have a better view of the market than an internal team working one book.

Vendors can provide 24-hour coverage across global markets, thus providing scalability solutions that usually require extra staff in internal teams (e.g. overnight global coverage, after-hours domestic market monitoring). The trading teams are geographically dispersed and have better color on the local markets they cover, allowing for better execution compared to a fund's internal team. Vendor trading teams usually comprise dozens of traders compared to internal trading teams of a few traders, which can be utilized if there's a large order spread across many regions to work.

Costs for outsourced trading are based per trade versus a monthly fee or salary. Based on the trading volume for full replication of passive indexes, cost estimates for outsourcing trading will be well below the cost of hiring a seasoned trader. Furthermore, vendors usually include trade reports and analysis in their service, which saves time, effort, and expertise for the client.

The disadvantages of outsourcing trading are: governance structure; less control over trading execution; oversight/review of trading.

Some of the governance issues to consider with an outsourced trading desk are: fulfilling the funds' fiduciary responsibility to its clients; maintaining the confidentiality of proprietary information; managing the risk of a communications gap between an outside trading desk and internal portfolio managers.

By outsourcing trading to a vendor, there is a loss over control of order flow. Though precise execution instructions can be sent with each order, ultimately execution is done by an external trader and trade analysis metrics may not capture issues relating to transparency and communication. Furthermore, in times of high market volatility, priority of execution is unclear when an outsourced trader has to fill orders from many clients. Internal trading teams may also face this issue in dealing with an agency broker.

Outsourcing trading requires constant review and oversight. Execution quality must be continually monitored and communication fluid between the internal team and the vendor. Internal traders are considered part of the team, but a vendor's alignment and incentives are not as clear and thus vigilance in oversight is necessary. On average, one to two weeks per quarter will be required for trading review and oversight by an analyst and a manager.

Commissions for full replication of the index are as are follows: cost of execution is $0.01/share for US equities; turnover of the index is 2.4% annually; portfolio size is $7 billion. The total estimated commissions are $13,956.71.

An EDHEC study shows that the annualized transaction costs for a cap-weighted universe of 3,000 securities averages around 0.05%. With a 5-year average turnover of 2.4% for the MSCI USA IMI index, the estimated transaction costs for full replication of the benchmark index is estimated to be around $165,200.

The total cost of outsourcing trading is $13,956.71.

Hybrid Trading

This scenario involves building the trading team within LACERA as well as having an outsourced trading vendor. LACERA can focus on trading familiar markets and outsource trading in other markets as well as cover for when the trading team is out/away.

The advantages of internal trading are: flexibility; maintaining control; talent, access, and scalability.

The trading team maintains oversight of trading, choosing which orders to execute internally and which to send to the vendor. For example, if there is sudden market volatility, the trading team can act immediately as opposed to sending instructions to the vendor and hoping for prompt execution ahead of other client orders. When entering new markets, the trading team can lean on the vendor for local market color and allow the vendor to manage execution of orders within that market. The internal trading team can enjoy vacations and sleep knowing there is a desk covering the markets.

The disadvantages of internal trading are: operational risk.

By having an internal trading team and an outsourced trading team, there is a chance for mixed signals or communication errors. Examples include: double orders, unclear instructions, forgetting which system is working what order. There may be mix-ups or errors for the middle and back office having two sources of trade data and having to compile and combine them. The risk system must be setup to incorporate both teams' executions. Having an IBOR would help to minimize this risk

Assume no hiring of staff and using current Investment team to conduct trading. Assume half of the orders are worked internally and the other half is outsourced. On average it takes one day per week and one manager 1 full day every other week to oversee portfolio trading. In addition, on average, one to two weeks per quarter will be required for trading review and oversight by an analyst and a manager.

Using the earlier figure of $13,956.71 annually for outsourced trading of the MSCI USA IMI with full replication, half the cost is $6,978.36.

The total cost for hybrid trading is $6,978.36.

Staffing

Hiring for Middle/Back Office

This scenario involves hiring for any gaps in the middle office and back office teams within LACERA. The gaps may include unfamiliarity in areas such as regulatory compliance, settlements and clearances. LACERA may collectively have the skills internally to address these issues, but it might be simpler and potentially cheaper to assign these responsibilities to a specific hire.

The advantages of hiring for middle/back office are: fill specific gaps in coverage; new insights.

As internal management of assets is a new endeavor for LACERA, gaps of skills or experience for seamless operation of the middle and back office may exist in the internal team. For example, the Investment Accounting team may not be familiar with handling internal P&L reports, settlements or clearances. Collectively the Investment team may cover all the skills required, but certain responsibilities then get split up to different people and operational risk arises when multiple people handle multiple parts of a process. Hiring an individual to fill the gaps and take ownership of the processes will mitigate the operational risk. The new hire can also bring in new insights that may be beneficial for the overall operation.

The disadvantages of hiring for middle/back office are: cost & resources; lag of hiring, onboarding, results; team fit risk.

Hiring new staff is usually a time- and resource-intensive process. Job descriptions, job postings, resume reviews and screening, interviews, due diligence, offers and negotiation, transition and onboarding; the best-case scenario still takes a few months for a suitable candidate to join the team. There's a risk that after a long search, a suitable candidate is not found. There's an even worse scenario where someone joins the team but ends up being ill-suited for the responsibilities or doesn't fit with the team. Hiring the top-talent or best fit may cost more than expected.

The average middle and back office analyst salary at a large pension fund is $90,000. For the internal middle and back office responsibilities, one full-time hire would be needed to fill any gaps. Hiring internal middle and back office personnel will cost an estimated $90,000 annually.

Hiring for Trading

This scenario involves hiring a trader for the trading team within LACERA. The trader will be the primary individual within the Investment responsible for trading analysis, trade execution, reports, and research. Having one person to take ownership of the trading responsibilities will mitigate the operational risk of sharing trading duties between many people. Choosing a trader with experience trading the small cap names would be beneficial as they may run into liquidity issues on the US small-cap names. Selecting a trader with experience trading global names and across asset classes (e.g. futures, options, and treasuries) will help if/when internalizing other passively managed mandates. A backup trader will be needed for vacations, sick days and the like. This likely need not involve another full time hire but potentially may be an allocation of a portion of a current staff member's time.

The advantages of hiring for trading are: fill specific gaps in coverage; new insights.

As internal management of assets is a new endeavor for LACERA, gaps of skills or experience for seamless operation for trading may exist in the internal team. For example, the Investment team may not be familiar with the liquidity profile of the smallest names of the US small-caps and have difficulty getting in/out of positions during a rebalance. Hiring a trader with experience trading in global markets and across asset classes will smooth the internalization of other mandates. Hiring a trader to take ownership of the processes will mitigate the operational risk versus spreading trading responsivities across the team. The new hire can also bring in new insights that may be beneficial for the overall operation, such as provide market color and help shape the overall approach going into a rebalance.

The disadvantages of hiring for trading are: cost & resources; lag of hiring, onboarding, results; team fit risk.

Hiring new staff is usually a time- and resource-intensive process. Job descriptions, job postings, resume reviews and screening, interviews, due diligence, offers and negotiation, transition and onboarding; the best-case scenario still takes a few months for a suitable candidate to join the team. There's a risk that after a long search, a suitable candidate is not found. There's an even worse scenario where someone joins the team but ends up being ill-suited for the responsibilities or doesn't fit with the team; for example, many buy-side traders may be migrating to a different workplace culture when moving to the pension world, which may result in some frictions. Hiring the top-talent or best fit may cost more than expected.

The average senior trader salary at a large pension fund is $175,000. For the internal passive management of the MSCI USA IMI index, LACERA does not need to hire a trader, though for expansion into global markets or other asset classes a trader will most likely be needed.

Hiring a trader to handle trading responsibilities will cost an estimated $175,000 annually.

Potential Project Expansion / Phases

The internalization of management of the passive US portfolio leads the way for internalization of other categories such as: US factor based portfolio; developed markets excluding the United States; emerging markets; TIPS; active cash. The following analysis and comparisons are done assuming the successful internalization and operation of the passive US portfolio (**Phase 1**).

The categories have been divided into three phases based on complementary nature with the passive US portfolio internalization efforts, ease and cost of build, and potential savings, which are:

Phase 2: US factor based portfolio; developed markets ex US
Phase 3: Emerging markets
Phase 4: TIPS; active cash

Each phase will be analyzed within itself with the idea that Phase 1 will be executed first and Phase 4 last. For Phase 2, NAA recommends internalizing the US factor based portfolio first before internalizing the developed markets ex US. For Phase 3, NAA recommends internalization in accordance with decisions made in internalizing the developed markets ex US portfolio (Phase 2). For Phase 4, TIPS and active cash in general require more information for recommendations.

The analysis supporting the recommendations is below.

Phase 2 Analysis

Based on the analysis below, NAA recommends prioritizing internalization of the US factor based portfolio first due to economies of scale, ease of integration, and shorter timeline compared with the internalization of the developed markets ex US portfolio.

The US factor based portfolio leverages the infrastructure and systems built in Phase 1 so there are no major changes to procedures and processes in place. Conversely, major infrastructure and system changes will be required for the internalization of the developed markets ex US portfolio. The US factor based portfolio may need additional staff based on the capacity of the Investment team, whereas at least one hire will be needed for the management of the developed markets ex US portfolio. The US factor based portfolio has an estimated time to completion of six months versus twelve months for the developed markets ex US portfolio.

US Factor Based Portfolio

Internalizing a US equity static factor portfolio should not be a heavy lift if the internal management of the passive US portfolio is operational. Most of the procedures and processes required for the completion of Phase 1 are directly useable for this category. Additional personnel will be dependent on the capacity of the Investment team. The project will take approximately six months to complete.

The following sections will go through the efforts required to internalize the US equity static factor portfolio.

Infrastructure

Infrastructure changes to the procedures and processes in place will be minimal. Depending on the underlying universe for the strategy, the security master may need to be updated with missing names and history with verification of historical prices and corporate actions before loading into the database. Additional mapping of the security master to security universe and strategy may be required. Updates to system processes, software, etc. can continue to be carried out similar to Phase 1 scheduling as the market hours schedule is the same. Any updates can be carried out Thursday after market close with careful monitoring Friday so that issues can be addressed over the weekend.

System

System changes include modification of processes and procedures and update scheduling.

For processes and procedures, being able to split views into portfolios based on strategy as well as on an overall portfolio level will need to be developed and applied. Processes such as portfolio management, trading, performance measurement and risk analysis will all need to be done at the individual portfolio strategy level as well as the overall portfolio level. Most software in these processes should have this ability built in, but if not it may slow down the completion of the internalization of multiple strategies.

For update scheduling, data updates can be done anytime the US market is closed. Usually this involves a price and fundamentals update late in the evening and trading confirmations sent a few hours before the open the following morning. The confirmations can be checked with the closing positions and verified with positions in the portfolio management software before market open. No currency hedging is expected to be needed.

Personnel

Personnel changes will be dependent on a number of considerations such as the capacity of the Investment team and the turnover and rebalancing frequency of strategy.

If the Investment team is close to capacity operating the Phase 1 strategy, additional staff may be required. If the team has capacity to spare and feels comfortable conducting an additional strategy, additional staff may not be needed. The turnover and rebalancing frequency will also affect the capacity of the Investment team. In general, factor strategies are rebalanced more frequently than passive strategies and can have higher turnover – so it is likely that the US factor strategy will require more attention to manage.

If additional staff is required, given the experience of the Investment team with US equities, there is no need to hire a senior-level trader or portfolio manager; a junior trader or analyst will probably be sufficient to handle the more procedural processes while the experienced Investment team members focus on the more discretionary processes. If hiring, a focus can be to fill any gaps in coverage such as small/micro-cap trading expertise.

Strategy

Strategy methods and statistics are yet to be determined.

Timeline

NAA estimates that completion of internalization of the US factor based strategy will take approximately six months with an additional 2 months if an additional hire is necessary. A more in-depth timeline is available later in the presentation.

Cost

Item	Cost	Notes
Infrastructure		
Security Master	$1,000	Incremental cost of additional data storage, security mapping, price history.
Model Portfolio cost	$660,000	Estimated 3bps for model portfolio index creation
System		
Processes and Procedures	$5,000	Upgrade to multiple portfolios view
Personnel		
Additional staff	$80,000	Associate PM / trader for US equities
Total	$746,000	
External Costs	$1,320,000	US factor portfolio management of $2.2 billion at a net 6 bps fee
Total Savings	$574,000	

The costs are estimates and are not guaranteed

The total cost of building the internal US factor based strategy management operation is estimated to be **$746,000.** This cost includes a conservative estimate of adding a junior trader/analyst, which might not be necessary if the current staff have enough capacity to manage the strategy.

Using $60 billion as LACERA's total fund value, a 35% target equity allocation, and a 10% allocation to the US factor strategy, the total AUM for the US factor based strategy is approximately $2.2 billion. Using the median factor-based US equity management fee for large pension plans, the estimated external management cost for the portfolio is 6 basis points, and the estimated model portfolio construction cost is 3 basis points. The cost of outsourced management for the US factor based strategy is $1,320,000 annually.

Developed Markets Excluding US Portfolio

Due to the inclusion of non-US securities, internalizing the developed markets excluding US (DMexUS) portfolio will require many modifications to procedures and processes after the passive US portfolio is operational. Most of the procedures and processes setup during Phase 1 can either be modified to accommodate the universes of securities or similar processes can be setup and run in parallel with already established ones. Personnel additions are almost certainly required. The project will take approximately twelve months to complete.

The following sections will go through the efforts required to internalize the DMexUS portfolio.

Infrastructure

Infrastructure changes to the procedures and processes in place will be significant. The security master and databases must be updated to handle multiple markets, countries, currencies, and idiosyncrasies. As each market in the developed markets is different, each market will need to be stored separately from another with its idiosyncrasies addressed. For example, securities quoted on the London Stock Exchange are quoted in pence, not pounds (100 pence equals 1 pound). A currency database (if it doesn't already exist) will need to be created and referenced when calculating positions, exposures, and performance. Market open and close times will have to be adjusted and synced to a universal time measurement (e.g. UTC).

Full price histories will need to be backfilled and cleaned for each market, fundamental data will have to be mapped (each country has different reporting standards) and stored even if it will not be used in the immediate future. Reporting frequencies and handling of corporate actions differ by country, so a standardization process might need to be adopted. Regulatory differences such as tax codes will also need to be mapped and easily referenced for calculations.

System and software update processes will be more difficult to schedule, as it is best not to update during live market hours. There is a two-hour window from 4pm to 6pm EST weekdays where all markets are closed as well as the weekend.

System

System changes include modification of processes and procedures and update scheduling.

For processes and procedures, being able to split views into portfolios based on country, region, and overall portfolio level will need to be developed and applied; processes such as portfolio management, trading, and risk analysis will need to have a similar level of granularity. Most software in these processes should have this ability built in, but if not it may slow down the completion of this project.

For update scheduling, data updates will have to be done when one region's markets are closed but another region's is open. This can be done by having separate databases for each region and updating the price and fundamental data by region when that market is closed. New issues such as read-locking, overwriting, download/upload limits and memory/CPU usage will arise due to loading and using data at simultaneously.

Confirmations will be coming in, compared with the closing positions, and verified with positions in the portfolio management software while another market is active. With these live market updates, vigilance is needed in recording the most up-to-date positions as well as monitoring so that stale/non-updated positions are not accidentally loaded to the portfolio.

Currency hedging will be required to mitigate currency risk. LACERA currently uses an overlay program for currency hedging purposes. Either that will need to be adapted to the currency exposures of the DMexUS portfolio or another method, such as automatic brokerage hedging when executing a non-US market position, will need to be adopted. Some considerations when choosing an option are: time of currency exposure to offsetting hedge, frequency of adjusting the hedge, costs, and possible internal offsetting of currency exposures with other strategies.

Personnel

Additional personnel will be necessary and there are many options to consider. Options include: hiring a global trader; hiring a trader for each region (EMEA, APAC); hiring a trader and outsourcing trading (hybrid trading).

Hiring a global trader to cover the developed markets ex US can be sufficient for managing the DMexUS portfolio. The trader will be the primary responsible party for global trading though operations can be divided among the Investment team, facilitating knowledge transfer. With an annual turnover of 4.2% and quarterly index rebalancing for the MSCI ACWI IMI Developed Markets ex US index, the responsibilities should not be overwhelming on a daily basis, though the rebalances may require multiple staff to assist. Issues may arise due to work hours and having to cover two regions as well as time off due to vacations, holidays, etc. It is worth nothing that holidays between the different regions rarely overlap, resulting in very few off days for those covering multiple markets.

Hiring a trader to cover each region - Europe, Middle East, Africa (EMEA) and Asia Pacific (APAC) - is another solution. This setup will allow focused coverage on one region and the ability to hire for expertise in the region instead of hiring a generalist with broader global experience. Having a trader to cover each region splits up the work hours relatively evenly and can cover for each other during time off. As Phase 2 is completed and Phase 3 (emerging markets) commences, the traders should naturally extend their coverage into emerging markets within their regions without major shifts in process.

Utilizing a Hybrid Trading model, in which the Investment team is supported by an outsourced trading team, is also a solution. This model involves hiring a global trader as the primary responsible party for global trading operations, who will split execution between working orders through the broker versus relying on the outsourced trading desk for fills. The trader can focus on execution quality and divide orders based on expertise or performance metrics. One caveat of this approach is that it does not facilitate knowledge transfer internally and the trader can easily increasingly rely on the outsourced trading team for execution.

NAA recommends hiring one additional trader with the likely further addition of a second. Hiring a single additional trader for non-US trading can increase reliance on outsourced trading desks for additional coverage but, with passive portfolios, the trading burdens should not be too onerous. If hiring a second trader, economies of scale can be achieved through internalizing the passive emerging markets portfolio (Phase 3).

Strategy

The passive management of the MSCI ACWI IMI Developed Markets exUS index is relatively straight forward. Similar to the passive US management, an overall partial replication method can be used with a "split" portfolio into a "buy-and-hold" portion utilizing full replication and a "potential sale" portion utilizing partial replication. Diligence will have to be paid on regulatory restrictions, tax codes, currency hedging, and country idiosyncrasies.

It is worth noting that for rebalancing adjustments the DMexUS portfolio may be more costly than the passive US portfolio due to increased transaction costs and unwinding of currency hedges. Analysis into transaction costs versus tracking error of the target US/DMexUS allocations during rebalancing adjustments may be worth considering.

The turnover is low at 4.2% annually with a quarterly rebalance. As mentioned previously, passive management of the DMexUS index should not be overwhelming on a daily basis and support from other team members can be utilized during rebalances.

Timeline

NAA estimates that completion of internalization of the passive management of the DMexUS index will take approximately twelve months to completion. A more in-depth timeline is available later in the report.

Cost

Item	Cost	Notes
Infrastructure		
Security Master	$10,000	Incremental cost of additional data storage, security mapping, price history, country mapping, currency history, standardization of fundamental data, etc.
System		
Processes and Procedures	$10,000	Upgrade to multiple portfolios view. Rolling updates and positions. Currency hedging.
Personnel		
Additional staff	$175,000	One trader covering non-US equities
Total	**$195,000**	
External Costs	$430,000	DMexUS management of $4.3 billion at 1 bp fee
Total Savings	**$235,000**	

The costs are estimates and are not guaranteed

The total cost of building the internal passive Developed Markets ex US index management operation is estimated to be **$195,000.**

Using $60 billion as LACERA's total fund value, a 35% target equity allocation, a 60% allocation to the passive management, and a 76% allocation to developed markets in the MSCI ACWI IMI Developed Markets exUS, the total AUM for the DMexUS strategy is approximately $4.3 billion. Based on median passive developed markets ex US equity management fees for large pension plans of 1 basis point the cost of outsourced management for the DMexUS portfolio is $430,000 annually.

Phase 2 Summary

Theme	Item	US Factor	DMexUS
Infrastructure	Security Master	Minimal changes	Country-specific idiosyncrasies. Currency table. Fundamental data differences. UTC sync.
	Processes Update Schedule	Update anytime US markets are closed.	2-hour window from 4pm-6pm EST on trading days
System	Processes and Procedures	Incorporate multiple portfolios into the portfolio management, trading, and risk processes.	Incorporate multiple portfolios into the portfolio management, trading, and risk processes.
	Data Update Schedule	Prices, fundamentals, corporate actions, etc. updated after market close.	Rolling updates as markets open/close (Asia, EMEA, Americas). Read-lock, overwriting, CPU/memory, data upload/download issues.
	Positions Update Schedule	Load and update positions before open and true up after close.	Load and update positions after close of each market. Position checks for stale/non-updated positions, especially for the closed markets.
	Currency Hedging	None to minimal	Continue using currency forwards? Broker solution?
Personnel	Trade Team	Internal Trading only	Internal or Hybrid Trading (internal + outsourced team)
	Staffing	One analyst/associate	One senior trader
Strategy	Turnover	TBD	4.2% annual
	Rebalancing Schedule	TBD	Quarterly Index Review
Timeline	Project Length	6 months	12 months
Cost	Target AUM	$3.2 billion	$4.3 billion
	Management Fees	$1,320,000	$430,000
	Cost to build	**$746,000**	**$195,000**
	Cost Savings	$574,000	$235,000

Phase 3 Analysis

Based on the analysis below, NAA recommends internalization of the passive emerging markets management dependent on how many traders were added in Phase 2.

If two traders were added for the DMexUS portfolio, one covering APAC and another EMEA, coverage of the emerging markets can be a natural extension of responsibilities as long as there is sufficient capacity. If only one trader was added for the DMexUS portfolio covering both APAC and EMEA, adding emerging markets to the trader's responsibilities may be above capacity.

As most infrastructure and systems were setup during the DMexUS development, and the strategy is relatively straightforward as it is passive management, the internalization and integration of this portfolio should be a relatively light lift and short time to completion of six months.

Emerging Markets Portfolio

Internalizing the emerging markets (EM) portfolio should not require too much outside of integrating new markets, prices, and fundamentals to get up and running if the internal management of the passive DMexUS portfolio is already operational. Most of the procedures and processes required for the completion of Phase 2 are directly useable for this category. Additional personnel will be dependent on the capacity of the Investment team.

The following sections will go through the efforts required to internalize the EM portfolio.

Infrastructure

Infrastructure changes to the procedures and processes in place will involve adding the emerging markets countries and securities into the security master as well as price data, fundamental data, and currency data histories. Updates to system processes, software, etc. can continue to be carried out similar to DMexUS portfolio scheduling as the market hour schedules are very similar.

System

System changes include modification of processes and procedures and update scheduling.

For processes and procedures, an additional view for portfolios based on the developed versus emerging classification will need to be created. Processes for rolling data and position updates should be similar to those developed for the DMexUS portfolio and can either be incorporated into the DMexUS portfolio processes or separately created.

Currency hedging solutions may need to be considered separately from solutions for the DMexUS portfolio as emerging markets currencies may not be as liquid as developed market currencies.

Personnel

Personnel changes will be dependent on previous hires in Phase 2 as well as capacity.

If two traders were added for the management of the DMexUS portfolio, one covering APAC and another EMEA, coverage of the emerging markets can be a natural extension of responsibilities for the traders. So long as there is capacity, having the traders cover the additional markets is an economy-of-scale benefit and should take advantage of the regional market expertise of the traders, even if the local markets are novel.

If only one trader was added for the DMexUS portfolio covering both APAC and EMEA, adding emerging markets to the trader's responsibilities may be above capacity. In this instance adding another trader for coverage of the emerging markets may cost more than outsourcing trading of the EM portfolio. It may make more sense to continue using outsourced trading of the EM portfolio in this scenario.

Given our recommendation in Phase 2 for DMexUS, a conservative cost estimate would be to hire another senior trader to cover the emerging markets portfolio.

Strategy

The passive management of the MSCI ACWI IMI Emerging Markets index is relatively straight forward. Similar to the passive US management, an overall partial replication method can be used with a "split" portfolio into a "buy-and-hold" portion utilizing full replication and a "potential sale" portion utilizing partial replication. Diligence will have to be paid to regulatory restrictions, tax codes, currency hedging, and country idiosyncrasies.

It is worth noting that for rebalancing adjustments the EM portfolio may be more costly than the passive US portfolio due to increased transaction costs and unwinding of currency hedges. Analysis into transaction costs versus tracking error of the target US/DMexUS/EM allocations during rebalancing adjustments may be worth considering.

The turnover of the EM portfolio is 11.47% annually with a quarterly rebalance. As the turnover is higher than the passive US or DMexUS strategies, any trader skill in improving transaction costs will be more beneficial compared with a lower turnover strategy.

Timeline

NAA estimates that completion of internalization of the EM strategy will take approximately six months with an additional 2 months if an additional hire is necessary. A more in-depth timeline is available later in the report.

Cost

Item	Cost	Notes
Infrastructure		
Security Master	$10,000	Incremental cost of additional data storage, security mapping, price history, country mapping, currency history, standardization of fundamental data, etc.
System		
Processes and Procedures	$5,000	Creating Developed vs. Emerging markets view. Rolling updates and positions. Currency hedging.
Personnel		
Additional staff	$175,000	One senior trader for EM
Total	**$190,000**	
External Costs	$1,260,000	EM management of $1.4 billion at 9 bps fee
Total Savings	$1,070,000	

The costs are estimates and are not guaranteed

The total cost of building the internal passive Emerging Markets index management operation is estimated to be **$190,000.**

Using $60 billion as LACERA's total fund value, a 35% target equity allocation, a 60% allocation to the passive management, and a 24% allocation to developed markets in the MSCI ACWI IMI Emerging Markets, the total AUM for the EM strategy is approximately $1.4 billion. Based on median passive EM equity management fees for large pension plans of 9 basis points per dollar of AUM, the cost of external management for the emerging markets portfolio is $1,070,000 annually.

Phase 3 Summary

Theme	Item	EM
Infrastructure	Security Master	Country-specific idiosyncrasies. Currency table. Fundamental data differences. UTC.
	Processes Update Schedule	2-hour window from 4pm-6pm EST on trading days
System	Processes and Procedures	Incorporate multiple portfolios into the portfolio management, trading, and risk processes.
	Data Update Schedule	Rolling updates as markets open/close (Asia, EMEA, Americas). Read-lock, overwriting, CPU/memory, data upload/download issues.
	Positions Update Schedule	Load and update positions after close of each market. Position checks for stale/non-updated positions, especially for the closed markets.
	Currency Hedging	Continue using currency forwards? Broker solution?
Personnel	Trade Team	Internal or Hybrid Trading (internal + outsourced team)
	Staffing	One senior trader
Strategy	Turnover	11.5% annual
	Rebalancing Schedule	Quarterly Index Review
Timeline	Project Length	6 months
Cost	Target AUM	$1.4 billion
	Management Fees	$1,260,000
	Cost to build	$190,000
	Cost Savings	$1,070,000

Phase 4 Analysis

NAA needs more information for a recommendation on internalization of the treasury inflation-protected securities (TIPS) portfolio as well as the active cash management portfolio.

In general, the infrastructure and system changes should be straight-forward for both strategies.

Further analysis for the TIPS portfolio includes: an analysis of the current fixed income team's infrastructure, experience, and capacity; benchmark; turnover and rebalance frequency.

Further analysis for the active cash portfolio includes: an analysis of current active cash strategies and the managing team, including infrastructure, experience, and capacity; benchmark; rates and balances among prime brokers, custodian bank, and counterparties; rebalancing frequency.

Treasury Inflation-Protected Securities Portfolio

The procedural processes of internalizing the TIPS portfolio are relatively straight forward. NAA does not have a good assessment of the current fixed income team's infrastructure, skills and experience, and capacity for internalization efforts. After conducting this assessment, NAA should be able to provide an estimate of cost to internalize as well as feasibility.

The following sections will go through the efforts required to internalize the TIPS portfolio.

Infrastructure

Internalizing the TIPS portfolio will require integrating TIPS maturity, prices, and coupon payments into current processes and procedures, if not already done. The benchmark, for example the Bloomberg Barclays US Treasury Inflation Notes TR Index, data and holdings will also have to be collected daily. Prices can be collected after market close daily and will not be too complex as there is only one security, though with different maturities and coupon payments.

System

An analysis of current processes and procedures for fixed income management within LACERA will need to be conducted before changes needed to be made, if any, are recommended.

In general, having views for bond statistics such as YTM, average coupon, average effective maturity, and average duration should be available on the portfolio level with the ability to view individual TIPS holdings within the portfolio. While this can be easily done on software such as Bloomberg, copies of the data should be collected and stored on a daily basis.

TIPS are not expected to be heavily traded, so daily price updates and position updates should be sufficient for the management of the portfolio. No currency hedging will be required.

Personnel

Personnel changes will be dependent on the current fixed income team's experience and capacity. If the current team does not have the capacity to manage the TIPS portfolio internally it may be cheaper to outsource the TIPS portfolio management compared to building an internal management solution.

Strategy

More information is required regarding the management of the TIPS portfolio. For example, is the benchmark a public benchmark such as the Bloomberg Barclays US Treasury Inflation Notes TR Index or an internal benchmark? Construction and management of the portfolio will be dependent on the responses.

In general, TIPS have semi-annual inflation adjustments which are taxable if the coupons and/or principal are adjusted higher. TIPS auctions occur almost monthly with varying maturities of 5, 10, and 30 years.

Timeline

More due diligence is required to provide an achievable timeline. However, given the straightforward process of infrastructure and system development, and should no additional hires be necessary, the internalization can be completed in six months.

Cost

More due diligence is required to provide an accurate budget for internalization of the TIPS portfolio.

Active Cash

The processes of internalizing active cash management are relatively straightforward. NAA does not have a good assessment of the current active cash management infrastructure, skills and experience, and capacity for internalization efforts. After conducting this assessment, NAA should be able to provide an estimate of cost to internalize as well as feasibility.

The following sections will go through the efforts required to internalize active cash management.

Infrastructure

Internalizing the active cash management will require price data, rates, balances, margin balances, and thresholds for all repositories of cash. Furthermore, data for money markets, ETFs, index futures, and other instruments for investing the cash will need to be collected and stored daily. The database should be flexible to incorporate many investment instruments, allowing new instruments to be added and integrated quickly.

System

An analysis of current processes and procedures for active cash management within LACERA will need to be conducted before changes needed to be made, if any, are recommended

In general, having views for cash balances at each repository (prime broker, custodian bank, counterparties, etc) as well as an overall balance will be necessary. While this can be easily done on software, copies of the data should be collected and stored on a daily basis.

Cash may be a more fluidly traded vehicle as there are constant streams being received from dividends, coupon payments, securities lending fees, etc. Price updates should be chosen at an appropriate frequency.

Personnel

Personnel changes will be dependent on the active cash management team's experience and capacity. If the current team does not have the capacity to manage the active cash portfolio internally, hiring a trader or portfolio manager to handle the duties would likely end up costing less than outsourcing the management.

Strategy

More information is required regarding the management of the active cash portfolio. For example, is the benchmark internal or external? Construction and management of the portfolio will be dependent on the responses.

Timeline

More due diligence is required to provide an achievable timeline. However, given the straightforward process of infrastructure and system development, and unless internalization requires a system overhaul of LACERA's overlay processes, the internalization can be completed in approximately six months should no additional hires be necessary. If hiring is necessary, an additional one to two months will be needed.

Cost

More due diligence is required to provide an accurate budget for internalization of the active cash management portfolio.

Phase 4 Summary

Theme	Item	TIPS	Active Cash
Infrastructure	Security Master	Only one security with varying maturity dates and yields.	Data for money markets, ETFs, index futures. Rates, balances, margin balances, thresholds.
	Processes Update Schedule	Update once a day with closing prices.	Update once a day with closing prices.
System	Processes and Procedures	Views for bond stats such as YTM, average coupon, average effective maturity, average duration.	View for consolidation of cash balances at prime brokers, custodian banks, counterparties.
	Data Update Schedule	Update once a day with closing price or based on schedule with other US government bonds.	Update once a day with closing prices or based on current active cash schedule.
	Positions Update Schedule	Load and update positions daily.	Update frequency TBD.
	Currency Hedging	None	None
Personnel	Trade Team	Requires more information	Requires more information
	Staffing	Requires more information	Requires more information
Strategy	Turnover		
	Rebalancing Schedule	Semi-annual inflation adjustments. Auctions almost monthly.	Requires more information
Timeline	Project Length	Requires more information	Requires more information
Cost	Target AUM	$1.5 billion	$1.7 billion
	Management Fees	$150,000	$850,000
	Cost to build	Requires more information	Requires more information
	Cost Savings		

Potential Project Expansion / Phases Summary

The cost table below summarizes costs of external management, costs to internalize the strategy, and cost savings from internalization. Note that each phase leverages the infrastructure and systems built in the previous phases, taking advantage of previous developments and economies of scale to achieve the cost savings. Thus, reordering the phases may result in vastly different cost estimates.

Phases	Description	External Cost	Internalization Cost	Estimated Cost Savings
1	Passive US equities	$700,000	$192,075	$507,925
2	US factor based equities	$1,320,000	$746,000	$574,000
2	Passive Developed Markets exUS equities	$430,000	$195,000	$235,000
3	Passive Emerging Markets equities	$1,260,000	$190,000	$1,070,000
4	Treasury Inflation-Protected Securities (TIPS)		TBD	TBD
4	Active cash		TBD	TBD

The costs are estimates and are not guaranteed

Aggregating the costs by phase results in the cost table below:

Cumulative Costs	External Cost	Internalization Cost	Estimated Cost Savings
Phase 1 Total	$700,000	$192,075	$507,925
Phase 1+2 Total	$2,450,000	$1,133,075	$1,316,925
Phase 1+2+3 Total	$3,710,000	$1,323,075	$2,386,925

The costs are estimates and are not guaranteed

Internalization efforts can achieve significant cost savings, especially in the later phases as the subsequent builds leverage the existing infrastructure and systems built and adapt them for portfolios that cost more to manage externally.

Passive US Equity Index Deliverables Timeline

Duration denoted in parenthesis

2020 Q3 | 2020 Q4 | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 | 2022 Q1

Asset Internalization Analysis (2m)

Report detailing conclusions of analyses into asset internalization efforts and governance structure review

Board Presentation & Decision

Presentation to the Board, decision on Phase 3 of project.

Identifying Outsourced Vendors (6m)

Due diligence on middle and back office, trading providers. Contract Negotiations.

Tasklists Creation (3m)

Net Alpha Advisors' responsibilities, milestones creation, LACERA task list, timelines, systems ownership & processes handoff

Technology Architecture Build (6m)

Network requirements, network infrastructure implementation, business continuity plans, security

Operational Infrastructure (9m)

Defining and setting up modular systems: portfolio strategy; risk management; performance attribution; trading; paper portfolios; deployment & monitoring; middle & back office, other

Outsourced Vendor Integration (6m)

Establish connections, integration, build processes, test functions.

Operational Infrastructure

Identified vendors / systems for each module. Vertical integration of the modular systems and processes.

Technology Architecture

Data and Vendor integration into internal systems. Automating processes and establishing checks.

Technology Architecture

Data and Vendor integration nearly complete. Processes running smoothly.

Operational Infrastructure

Paper portfolios up and running. Initial systems for trading operational. Policies and procedures prepared by LACERA staff

Processes Handoff

Systems ownership & processes handoff to LACERA staff

Account Funding

Confirm all systems and processes functional. Ready to deploy capital.

Live Trading

First trade date. Deploy first tranche. Monitor & Adjust.

US Factor Based Equity Index Deliverables Timeline

Duration denoted in parenthesis

Infrastructure Changes (2m)

Security master changes; database updates; network and ingress / egress adjustments

System Changes (2m)

Amending processes and procedures of the modular systems: portfolio strategy; risk management; performance attribution; trading; paper portfolios; deployment & monitoring; middle & back office, other

Infrastructure Changes

Security master updating daily. Database updating daily. Ingress / egress comfortably within limits.

Account Funding

Confirm all systems and processes functional. Ready to deploy capital.

Live Trading

First trade date. Deploy first tranche. Monitor & Adjust.

Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month6

Tasklists Creation (3w)

Net Alpha Advisors' responsibilities, milestones creation, LACERA task list, timelines, systems ownership & processes handoff

Strategy Development (2m)

Developing factor model. Underlying universe, factor selection, weighting, rebalancing schedule, turnover statistics.

Strategy Development

Factor model complete. Begin to receive factor model daily, integration into database / software.

System Changes

Paper portfolios up and running. Initial systems for trading operational. Policies and procedures prepared by LACERA staff

Processes Handoff

Systems ownership & processes handoff to LACERA staff

Passive Developed Markets ex US Equity Index Deliverables Timeline

Duration denoted in parenthesis

Infrastructure (5m)

Security master changes; database updates; process update schedule; network and ingress / egress adjustments

Staffing (6m)

Position descriptions; interview structure and methods; identify candidates; interview; hiring and onboarding; training

Infrastructure

Security master adjusted for global securities. All processes in UTC. Prices coming in daily.

Staffing

Begin interviewing candidates

Infrastructure

Processes update schedule stress tested. Global fundamental data standardized.

Staffing

Finish interviewing candidates. Submit offers.

Staffing

Begin onboarding.

Systems

Paper portfolios up and running. Initial systems for trading operational. Policies and procedures prepared by LACERA staff.

Account Funding

Confirm all systems and processes functional. Ready to deploy capital.

Live Trading

First trade date. Deploy first tranche. Monitor & Adjust.

Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 | Month 7 | Month 8 | Month 9 | Month 10 | Month 11 | Month 12

Tasklists Creation (4w)

Net Alpha Advisors' responsibilities, milestones creation, LACERA task list, timelines, systems ownership & processes handoff

Systems (8m)

Amending processes and procedures of the modular systems: portfolio strategy; risk management; performance attribution; trading; paper portfolios; deployment & monitoring; middle & back office, other

Systems

Rolling data updates as markets open/close by region. Addressing database ingress/egress issues.

Systems

Adjusting views in software / modules for global, regional, and country-level granularity.

Systems

Testing loading positions for markets while system is live. Develop checks for stale positions.

Systems

Confirm integration across modules for global securities processes.

Systems

Integration with broker. Begin developing paper portfolios.

Processes Handoff

Systems ownership & processes handoff to LACERA staff

Item	Notes	Vendor Responsibility	LACERA Responsibility	Business Continuity
Data				
Index Constituent Data	Global index/benchmark constituents, daily returns, and benchmark characteristics	Delivering accurate and timely data via ingestion method (e.g. platform, direct download, FTP)	Ingestion of data into internal processes. Verifying accuracy of data (e.g. validate with another source)	Daily download to internal servers, weekly backup to offsite/cloud server.
Market Data	Daily price data	Delivering accurate and timely data via ingestion method (e.g. platform, direct download, FTP)	Ingestion of data into internal processes. Verifying accuracy of data (e.g. validate with another source)	Daily download to internal servers, weekly backup to offsite/cloud server.
Reference Data	Corporate Actions	Delivering accurate and timely data via ingestion method (e.g. platform, direct download, FTP)	Ingestion of data into internal processes. Verifying accuracy of data (e.g. validate with another source)	Daily download to internal servers, weekly backup to offsite/cloud server.
Modules				
Portfolio Management System	Software/system to build, analyze, optimize portfolio	Deliver accurate portfolio positions. Assist in establishing and maintaining connections between other systems (e.g. OMS/EMS)	Verify portfolio positions. Establish and maintain connections with other systems.	Daily download of positions. Weekly backup to offsite/cloud server with daily backups on rebalancing days or days over a certain threshold (i.e. 5% turnover).
Risk System	Model/system used to monitor and assess past, current, and future portfolio exposures	Deliver accurate and timely risk model upon request.	Verify model accuracy. Incorporation into decision processes.	Scheduled download to internal servers. Scheduled backup to offsite/cloud server with daily backups on rebalancing days or days over a certain threshold (i.e. 5% turnover).
Performance Attribution	Software/system used to monitor and assess portfolio and trading performance	Deliver accurate and timely attribution report/analysis upon request.	Verify underlying data and results accuracy. Incorporation of results into decision processes.	Daily download of reports. Weekly backup to offsite/cloud server with daily backups on rebalancing days or days over a certain threshold (i.e. 5% turnover).

Item	Notes	Normal Use	Abnormal Use (Level 1)	Abnormal Use (Level 2)	Abnormal Use (Level 3)
Data					
Index Constituent Data	Global index/benchmark constituents, daily returns, and benchmark characteristics	Platform access.	Platform Access.	Access data from internal servers	Access most recent backup from remote server and bootstrap missing data from data provider (via FTP, API, email, etc.)
Market Data	Daily price data	Platform access.	Platform Access.	Access data from internal servers	Access most recent backup from remote server and bootstrap missing data from data provider (via FTP, API, email, etc.)
Reference Data	Corporate Actions	Platform access.	Platform Access.	Access data from internal servers	Access most recent backup from remote server and bootstrap missing data from data provider (via FTP, API, email, etc.)
Modules					
Portfolio Management System	Software/system to build, analyze, optimize portfolio	Platform access.	Platform access.	Excel spreadsheet with internal server data.	Excel spreadsheet with most recent remote server backup and bootstrap missing data from email confirms (i.e. trading reports, settlement)
Risk System	Model/system used to monitor and assess past, current, and future portfolio exposures	Internal server access.	Internal server access.	Use data from internal servers.	Access most recent remote server backup.
Performance Attribution	Software/system used to monitor and assess portfolio and trading performance	Platform access.	Platform access.	Excel spreadsheet with internal server data.	Excel spreadsheet with most remote server recent backup and bootstrap missing data from email confirms (i.e. trading reports, settlement)

Item	Notes	Vendor Responsibility	LACERA Responsibility	Business Continuity
Trading & Operations				
Middle & Back Office	IBOR	N/A	In-house custom built IBOR. Ensure data to build IBOR is readily available (i.e. internal server access, remote server access, reports).	IBOR - building internally off OMS/EMS. Weekly backup to offsite/cloud server with daily backups on rebalancing days or days over a certain threshold (i.e. 5% turnover).
Middle & Back Office	Trade Allocations & Confirmation	Provide back office functions in an accurate and timely manner. Provide data via alternative delivery methods in case primary method is not available (e.g. download to internal server).	Verify accuracy of reports.	Daily download of reports. Weekly backup to offsite/cloud server.
Middle & Back Office	Clearing & Settlement	Ensure all steps leading to settlement, recording of transaction, delivery of the securities to the custodian and transfer of money to the seller.	Ensure that settlement is completed within T+3 days, money for the securities has been transferred, custodian is able abd ready to receive/deliver securities.	Daily download of clearing and settlement reports. Weekly backup to offsite/cloud server. Alternative forms of delivery (e.g. email of settlements)
Middle & Back Office	Custodian(s)	Ensure custody of securities, continue or suspend programs (e.g. securities lending, cash management), clear communication in case normal methods of delivery/contact are not available	Verify custodian has received custody of assets, decisions of programs, continued communication with Custodian	Clear direction of modified processess and communication during the crisis. Instructions for the Custodian in case LACERA staff cannot be reached in a timely manner.
OMS/EMS	Integrated OEMS or separate	Provide continuous access to proprietary networks and connectivity to the best of their ability	Be aware of connectivity issues before and during order execution. Prepare order crash kit before trading in case connectivity is lost (e.g. screenshots of positions being worked and instructions).	Ensure connectivity to OMS/EMS by designated LACERA Investments staff.
Trading	Order Execution	Expedient, latency-sensitive execution in accordance with order instructions	Sending order instructions for execution. Monitoring and adjusting execution.	Ensure order instructions are sent for execution in a clearly understood and consistent manner.
Trading	Trade Analytics & Research	Provide timely and accurate trade data and execution quality metrics.	Verify order data. Execution quality analysis.	Ensure trade data and reports are accurate and sent in a timely manner. Weekly backups to offsite/cloud server.
Trading	Trade Reporting	Provide timely and accurate trade data. If vendor provides report, deliver report in a timely matter.	Adhere to regulatory requirements for trade / best execution reporting.	Ensure data is accurate. Verify vendor reports or run reports internally. Weekly backups to offsite/cloud server.

Item	Notes	Normal Use	Abnormal Use (Level 1)	Abnormal Use (Level 2)	Abnormal Use (Level 3)
Trading & Operations					
Middle & Back Office	IBOR	Internal server access.	Internal server access.	Internal server access.	Access most recent remote server backup and bootstrap missing data from email confirms (i.e. trade reports, settlement).
Middle & Back Office	Trade Allocations & Confirmation	Internal server access, direct download, automated integration	Internal server access.	Internal server access. Utilize alternative delivery method (e.g. email of confirms/settlements).	Access most recent remote server backup.
Middle & Back Office	Clearing & Settlement	Internal server access, direct download, automated integration	Internal server access.	Internal server access. Utilize alternative delivery method (e.g. email of confirms/settlements).	Access most recent remote server backup.
Middle & Back Office	Custodian(s)	Contractual obligations, established policies and procedures, email.	Contractual obligations, established policies and procedures, email.	Contractual obligations, established policies and procedures in case of crisis, email.	Contractual obligations, established policies and procedures in case of crisis, email.
OMS/EMS	Integrated OEMS or separate	Platform access.	Platform access through internal server.	Platform access through internal server.	Have an order crash kit to bridge gap between OMS/EMS implementation breaks. Flowchart of processes, contact numbers, order templates that can be emailed/faxed.
Trading	Order Execution	OMS/EMS	OMS/EMS	OMS/EMS	Order crash kit instructions over email/fax.
Trading	Trade Analytics & Research	Internal server access. Email.	Internal server access. Email.	Internal server access. Email.	Access most recent remote server backup. Email.
Trading	Trade Reporting	Vendor. Internal server access. Email.	Vendor. Internal server access. Email.	Vendor. Internal server access. Email.	Vendor. Access most recent remote server backup. Email.

L//.CERA

FOR INFORMATION ONLY

September 29, 2020

TO: Trustees – Board of Investments

FROM: Vache Mahseredjian, CFA, CAIA, FRM, ASA VM
Principal Investment Officer

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: YANKEE BONDS AND EMERGING MARKET DEBT

BACKGROUND

During the meeting of the Credit and Risk Mitigation Committee in September, the Committee Chair asked about the potential overlap between Yankee bonds and emerging market debt. This memo attempts to address those questions.

OVERVIEW

We begin by defining Yankee bonds and providing an overview of the Yankee component of the Bloomberg Barclays U.S. Aggregate Bond Index ("Agg"), which is LACERA's benchmark for the Investment Grade Bond portion of the Risk Mitigation functional category. To be included in the Agg, issues must be dollar-denominated, SEC-registered, rated investment grade, have a minimum maturity of one year, and meet minimum issue size requirements. Bonds must also be fixed-rate and non-convertible.

Next, we provide an overview of the most commonly used benchmarks of U.S. dollar-denominated emerging market debt (EMD): 1) the JP Morgan Emerging Markets Bond Index Global Diversified (EMBI GD), an index of bonds and loans issued by sovereigns and government-supported agencies, and 2) the JP Morgan Corporate Emerging Markets Bond Index Broad Diversified (CEMBI BD). To be included in these indices, issues must satisfy JP Morgan's rules regarding eligibility (country of origin and instrument type) and liquidity (minimum issue size). Both EMD indices encompass investment grade bonds as well as bonds rated below investment grade.

The EMBI GD and CEMBI BD are two of the three components of LACERA's benchmark for EMD. The third component is the JP Morgan Government Bond Index—Emerging Markets (GBI-EM), which contains government bonds denominated in foreign currencies that are traded in their respective local markets but are available to international investors. LACERA's benchmark is: 50% EMBI GD, 25% CEMBI, and 25% GBI-EM. Because bonds in the GBI-EM are denominated in local currencies, there is no possible overlap with Yankee bonds (which are denominated in U.S. dollars); therefore, the GBI-EM is not discussed further in this memo.

In the final section, we discuss the overlap among the indices.

INDEX COMPOSITION

Yankee Index

Yankee bonds are U.S. dollar-denominated bonds issued by a foreign entity—a foreign government, a government-supported agency, a supranational organization, or a corporation. Yankee bonds are issued and traded in the U.S. market. Yankee bonds that are included in the Agg must be registered with the SEC and must meet all other index requirements, including being rated investment grade by at least two of the three major rating agencies: Moody's, S&P, and Fitch. A question was also raised during the Committee meeting about Reverse Yankee bonds; these are bonds issued by U.S. entities but denominated in a foreign currency. Reverse Yankee bonds don't qualify for the Agg because they are not denominated in U.S. dollars. Nor do they qualify for inclusion in the EMD indices since they're not issued by entities domiciled in an emerging market.

Table 1 shows that as of August month-end, there were 1,358 Yankee bonds in the Agg, with a combined market value of $2 trillion, representing 8% of the Agg value.

Table 1: Market Value

Index	Market Value ($ Trln)	U.S. Agg (MV%)	# of Bonds
U.S. Aggregate	$ 24.4	100%	11,902
Yankee	$ 2.0	8%	1,358

Table 2 provides a sector breakdown of Yankee bonds in the Agg. Government-related bonds represent 48%, and Corporate issues represent 52%.

Table 2: Sector Composition of Yankee Bonds

	# of Bonds	Market Value ($ Thousands)	Market Value [%]
Total	1358	2,007,641,126	100.00
Government-Related	527	964,823,203	48.06
Agency	166	250,006,017	12.45
Local Authority	54	79,583,206	3.96
Sovereign	146	282,508,351	14.07
Supranational	161	352,725,630	17.57
Corporate	831	1,042,817,923	51.94
Industrial	465	553,693,953	27.58
Utility	10	8,045,526	0.40
Financial Institutions	356	481,078,444	23.96

Table 3 provides an overview of the Yankee index by country of issuer. Note that although the three largest countries of domicile are the UK, Canada, and Japan, the largest category of issuers is Supranational organizations such as the World Bank, the Asian Development Bank, InterAmerican Development Bank, the European Investment Bank, and the African Development Bank. Most of the issuance in the index comes from developed—not emerging—countries. The largest emerging market

country in the Yankee index is Mexico, ranking #6.

Table 3: 20 Largest Issuers inYankee Index—by Country

		Market Value [%]			Market Value [%]
1	Supranational	17.57	11	Colombia	2.23
2	United Kingdom	15.05	12	China	2.18
3	Canada	13.66	13	France	1.82
4	Japan	8.13	14	Philippines	1.61
5	Germany	6.10	15	Spain	1.49
6	Mexico	4.31	16	South Korea	1.36
7	Netherlands	3.93	17	Peru	1.23
8	Belgium	3.82	18	Panama	1.17
9	Switzerland	2.53	19	Norway	0.97
10	Australia	2.36	20	Indonesia	0.93

Table 4 provides a breakdown of the Yankee index by rating category.

Table 4: Yankee Index by Credit Rating

	Market Value [%]
Total	100.00
Aaa	23.35
Aa	13.14
A	26.43
Baa	37.08

These numbers compare favorably to the broad U.S. Investment-grade credit market, which has only 8% in the highest category (Aaa), and more than 45% in the lowest category (Baa).

<u>EMBI GD Index</u>

Turning to the EMD indices, **Table 5** shows the 20 largest of the 70+ countries represented in the EMBI GD, with weights as of August month-end. The top 20 countries represent approximately 65% of the index market value. In terms of credit quality, 55% of the EMBI GD was rated investment grade (45% high yield).

Table 5: 20 Largest Countries in the EMBI GD

	COUNTRY	Mkt Cap %		COUNTRY	Mkt Cap %
1	INDONESIA	4.65	11	PERU	2.98
2	MEXICO	4.63	12	PANAMA	2.97
3	CHINA	4.16	13	COLOMBIA	2.94
4	SAUDI ARABIA	3.89	14	CHILE	2.88
5	UNITED ARAB EMIRATES	3.72	15	MALAYSIA	2.71

	COUNTRY	Mkt Cap %		COUNTRY	Mkt Cap %
6	QATAR	3.64	16	KAZAKHSTAN	2.66
7	RUSSIA	3.48	17	URUGUAY	2.55
8	TURKEY	3.19	18	BAHRAIN	2.55
9	PHILIPPINES	3.13	19	EGYPT	2.50
10	BRAZIL	2.99	20	SOUTH AFRICA	2.41

Table 6 summarizes the EMBI GD composition by region. Latin America was the largest sub-region representing 32% of the index market value, and Africa was the smallest, with a weight of just under 12%.

Table 6: EMBI GD by Region

Region	MV %
Africa	11.9
Asia	18.6
Europe	18.8
Latin America	32.4
Middle East	18.3

CEMBI BD Index

Turning to the CEMBI BD, **Table 7** shows the country composition of the corporate index, listing the top 20 countries of issuance among almost 60 countries represented in the index.

Table 7: Top 20 Countries in CEMBI BD

	COUNTRY	Mkt Cap %		COUNTRY	Mkt Cap %
1	CHINA	7.54	11	CHILE	3.90
2	BRAZIL	5.29	12	SINGAPORE	3.86
3	MEXICO	4.79	13	ISRAEL	3.69
4	HONG KONG	4.66	14	TURKEY	3.63
5	RUSSIA	4.42	15	PERU	3.41
6	INDIA	4.15	16	MACAU	3.37
7	SOUTH KOREA	4.10	17	QATAR	3.18
8	SAUDI ARABIA	4.08	18	THAILAND	3.07
9	UAE	4.03	19	PHILIPPINES	3.04
10	COLOMBIA	3.93	20	INDONESIA	2.91

Table 8 summarizes the CEMBI BD by region. The largest region is Asia, representing just under 40%. Reflecting the higher proportion of investment grade issuers in Asia, 58% of the CEMBI BD is rated investment grade (42% high yield). Note that the CEMBI BD has a slightly higher percentage of investment grade issuers (58%) than the sovereign EMBI GD index (55%).

Table 8: CEMBI BD Composition by Region

Region	MV %
Africa	6.2
Asia	39.1
Europe	10.4
Latin America	26.4
Middle East	17.9

The next table lists the 20 largest issuers in the CEMBI BD, along with their index weight, corporate sector, credit rating, and country of domicile. Recall that the CEMBI BD consists exclusively of U.S. dollar-denominated issues.

Table 9: 20 Largest issuers in CEMBI BD

	Issuer	MV %	Sector	Rating	Country
1	**TEVA**	2.1	Consumer	BB	Israel
2	**ARAMCO**	1.4	Oil & Gas	A1	Saudi Arabia
3	**SANDS CHINA**	1.4	Consumer	BBB-	China (Macau)
4	**ECOPETROL**	1.4	Oil & Gas	BBB-	Colombia
5	**PETROBRAS**	1.4	Oil & Gas	BB-	Brazil
6	**SAUDI ELECTRICITY**	1.2	Utilities	A2	Saudi Arabia
7	**BOC AVIATION**	1.2	Financial	A-	Singapore
8	**FIRST QUANTUM MINERALS**	1.1	Metals & Mining	CCC+	Zambia
9	**HUTCHISON**	0.9	Diversified	A2	Hong Kong
10	**GAZPROM**	0.9	Oil & Gas	BBB-	Russia
11	**BANGKOK BANK**	0.9	Financial	BBB+	Thailand
12	**TAQA ABU DHABI**	0.8	Utilities	AA3	UAE
13	**EQUATE PETROCHEMICAL**	0.8	Industrial	BBB	Kuwait
14	**YPF**	0.7	Oil & Gas	CCC+	Argentina
15	**QATAR TELECOM**	0.7	TMT	A2	Qatar
16	**AMERICA MOVIL**	0.7	TMT	A3	Mexico
17	**MELCO RESORTS**	0.7	Consumer	BB	China (Macau)
18	**ALTICE**	0.6	TMT	B	Israel
19	**ISBANK**	0.6	Financial	Caa3	Turkey
20	**SINGTEL**	0.6	TMT	A1	Singapore

Comparison of Three Indices

The following table compares the three indices in terms of market value, number of countries, and number of issues.

Table 10: Index Comparison

Index	Market Value ($ Bln)	# of Countries	# of Bonds
Yankee	2,008	34	1,358
EMBI GD	712	72	834
CEMBI BD	538	58	1,664

As shown above, the Yankee index has a much larger market value, and represents securities from fewer countries than the EMD indices.

With the assistance of LACERA's index provider, BlackRock, and detailed data from JP Morgan on the constituents of their EMD indices, we cross-referenced the three indices for overlapping issues. **Table 11** shows that of the 834 issues in the EMBI GD, 130 bonds issued by 11 entities, representing just under 22% of the EMBI GD's market value were included in the Yankee index. The three largest issuers represented in both the EMBI GD and the Yankee index were: the Philippines, Colombia, and Panama. For the CEMBI, 141 bonds from 23 issuers, representing 9.3% were also in the Yankee index. The three largest issuers in both the CEMBI BD and the Yankee index were: EcoPetrol (Colombia), Sands China, and BOC Aviation (Singapore/wholly owned sub of Bank of China).

Table 11: Bonds in Common with Yankee Index

Index	# of Issuers in common with Yankee Index	# of Bonds in common with Yankee Index	% of MV also in Yankee Index
EMBI GD	11	130	21.6%
CEMBI BD	23	141	9.3%

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

VM

FOR INFORMATION ONLY

September 25, 2020

TO: Trustees – Board of Investments

FROM: Scott Zdrazil
Senior Investment Officer

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: **COUNCIL OF INSTITUTIONAL INVESTORS MEMBER BALLOT**

Please find attached LACERA's ballot for the fall 2020 members business meeting of the Council of Institutional Investors' ("CII") which occurred on September 22, 2020.

BACKGROUND

LACERA is a member of CII. CII held a members business meeting on September 22, 2020 at which members voted on seven ballot items consisting of five proposed changes/modifications to CII policy on best governance standards which it uses for advocacy with companies and regulators and two voting items pertaining to organizational finances. All voting items received majority support.

1. Approve statement on disclosure of sustainability performance
   This is intended to support frameworks to guide companies to disclose material, financially relevant ESG factors, such as the Sustainability Accounting Standards Board, to which LACERA is affiliated.

2. Approve amending policy on the Public Company Accounting Oversight Board (PCAOB) enforcement actions
   This is intended to provide transparency into PCAOB enforcement investigations so that Audit Committee members of corporate boards are aware of any pending questions, as they endeavor to represent investors' interests on boards to exercise oversight of financial integrity.

3. Policy on Auditor Ratification Outcomes
   This suggests that the audit committees of corporate boards assess reasons for significant dissent in auditor ratification votes (such as more than 20% of investors voting no) and disclose what steps the committee may have taken to address reasons for investor dissatisfaction. The intent here is to address the current market dynamic

in which most auditors are approved with majority votes, but investors have little insight into board responsiveness when investors express significant dissent.

4. Approve policy on electronic means for shareholders to correspond with directors
   CII's current policy language had suggested mail contact info be provided for investor correspondence with corporate board directors. In the wake of COVID-19, this policy modification is a modernization of language to suggest companies provide an electronic address, to avoid mail piling up and to facilitate board director responsiveness.

5. Approve amendments on virtual meetings
   CII – like LACERA – welcomes the use of technology to broaden investor access to participate in shareholder meetings. However, CII and the broader investor community – as reported at last month's Corporate Governance Committee – have cautioned companies to only use technology to expand participation, not stifle it (such as limiting investors' ability to ask questions of directors they elect at shareholder meetings, etc.) In the wake of COVID-19, this proposed policy modification also recognizes present circumstances and suggests that virtual-only meetings may be acceptable in certain circumstances.

Consistent with LACERA policy, staff reviews business meeting items and votes in adherence to LACERA's *Corporate Governance Principles* and consultation with the Corporate Governance Committee Chair. **Attachment 1** is LACERA's ballot, submitted ahead of the advance voting deadline. **Attachment 2** includes descriptions of the business meeting items.

Attachments

Noted and Reviewed:

Jonathan Grabel
Chief Investment Officer

Council of Institutional Investors®
The voice of corporate governance

All advance proxies are due on or before 5PM ET on Friday, September 18. Proxies may be emailed or faxed to:
Attn: Michael Miller | Michael@cii.org | 202-822-0801

Working from home with no printer or fax? Please contact Michael Miller at Michael@cii.org for e-signature options.

CII U.S. Asset Owner Members' 2020 Fall Conference Proxy

Date: 9/15/2020

CII Member (Organization/Fund Name): LACERA - Los Angeles County Employees Retirement Association

Member Representative: Print Name: Scott Zdrazil

Signature: scott zdrazil

Business Meeting Action Items:

1. Approve 2021 Budget

See Appendix 2, page 9. X FOR ___ AGAINST ___ ABSTAIN

2. Approve amendments to Reserve Policy

See Appendix 3, page 10. X FOR ___ AGAINST ___ ABSTAIN

3. Approve statement on disclosure of sustainability performance

See Appendix 5, page 16. X FOR ___ AGAINST ___ ABSTAIN

4. Approve amendments to policy on PCAOB enforcement action transparency

See Appendix 6, page 18. X FOR ___ AGAINST ___ ABSTAIN

5. Approve revised policy on auditor ratification outcomes

See Appendix 7, page 19. X FOR ___ AGAINST ___ ABSTAIN

6. Approve policy on electronic means for shareholders to correspond with boards

See Appendix 8, page 20. X FOR ___ AGAINST ___ ABSTAIN

7. Approve amendments to policy on virtual-only shareholder meetings

See Appendix 9, page 22. X FOR ___ AGAINST ___ ABSTAIN

PLEASE NOTE: One vote per member organization. All ballots must be signed by a Membership representative. U.S. Asset Owner Members may change their votes at business meetings when they have previously submitted a proxy in advance of the meetings. A majority of U.S. Asset Owner Members must be represented in person or by ballot at Council meetings for the transaction of business. Ballot items require the affirmative vote of a majority of those voting. All ballots are confidential.

APPENDIX 2
APPROVE 2021 BUDGET

The 2021 budget the board recommends for approval is indicated in the yellow column in the table on pages 4 and 5. It includes revenue of $3,429,000 and expenses of $3,878,000, with an operating loss of $449,000.

The proposed budget in large part reflects staff's expectation that retaining current members and recruiting new members, as well as hosting robust in-person events, will be challenging amid a lingering pandemic and a recession. So far, however, staff continues to attract new members for 2021 and is not aware of plans by more than a few organizations to drop membership.

The proposed budget assumes CII will host a hybrid conference in the spring, with a small in-person contingent, and a more "normal" in-person conference in the fall that will be webcast for members who cannot attend. However, Washington, D.C. is still in its Phase 2 response to Covid-19 and gatherings of more than 50 people are prohibited. It is possible that the spring conference may have to be virtual-only, which would result in reduced revenue and expenses, assuming the conference hotel does not insist on compensation for cancellation. It would also put a damper on new member recruitment.

The CII board, mindful of the financial difficulties some member organizations face, has opted to rescind for 2021 inflation increases added in recent years on the maximum dues level for bundled and unbundled U.S. Asset Owner Members. This will reduce the maximum dues for bundled members from $31,000 to $30,000, the historic cap from 1992 to 2017. The maximum dues for U.S. Asset Owner Members that pay unbundled dues would decrease from $24,800 to $24,000.

On the expense side, we face significant increases in retirement contributions mainly because of changes in assumptions by Principal Group, our retirement plan provider, and market values at Dec. 31, 2019, the most recent measurement date for purposes of evaluating funding. We also face a large hike in health insurance expense for 2021.

If 2021 membership renewals prove weaker than expected, staff will recommend budget cuts to the board early in the new year. These could include further deferral on filling a staff position that has been vacant since the start of this August.

APPENDIX 3
APPROVE AMENDMENTS TO RESERVE POLICY

The board recommends board approval of the following revisions to CII's Reserve Policy, (clean version follows):

Reserve Policy

Purpose

The purpose of CII's Reserve Policy is to ~~meet the needs of the day-to-day operations of the Council and its properties, to provide adequate resources to maintain the properties and replace and maintain essential equipment, to~~ provide sufficient reserves to protect the organization against unforeseen economic emergencies and to provide financial support for special ~~issues for~~ initiatives that are beyond the means of the annual operating budget.

Authorized investments

The Council's reserve and all CII~~Council~~ investments shall be consistent with the board-approved Investment ~~p~~Policy. ~~statement.~~

Reserves

The Council will maintain a designated reserve of 100% of annual budgeted expenditures for the following purposes:

- ~~A reserve of 150100% of annual budgeted expenditures will be maintained~~ To protect the Council against unforeseen economic emergencies with respect to its operations; and
- T~~t~~o provide financial support for special initiatives ~~issues~~ that are beyond the means of the annual operating budget.

Rights and responsibilities

The board is responsible for periodically~~annually~~ reviewing and recommending amendments, if any, to the R~~r~~eserve P~~p~~olicy. The voting~~general~~ membership is responsible for approving the R~~r~~eserve P~~p~~olicy and any subsequent amendments to the policy.

The board and the voting membership shall approve expenditures that exceed~~ing~~ 10% of the reserve and are intended to fund special initiatives beyond the means of the member-approved annual budget, not simply to cover operating losses.~~are subject to the approval of the board and General Mmembership.~~ The ~~When authorizing expenditures from the~~

~~reserve, the~~ board shall annually disclose to the voting membership the status of the designated reserve, and any plans or ~~efforts also approve a plan~~ to replenish expenditures from it, when the board proposes the annual budget for member review and approval. ~~and shall present the plan to the general membership.~~

~~Excess Investments~~
~~The board shall report to the general membership a plan for handling any investments exceeding the Council's reserve.~~

Reporting
The board directs the executive director to coordinate the preparation of an annual reserves report on the designated reserve and any additional reserves for the treasurer to present to the board and voting~~General~~ ~~m~~Membership.

Clean version:

Reserve Policy

Purpose
The purpose of CII's Reserve Policy is to provide sufficient reserves to protect the organization against unforeseen economic emergencies and to provide financial support for special initiatives that are beyond the means of the annual operating budget.

Authorized investments
The Council's reserve and all CII investments shall be consistent with the board-approved Investment Policy.

Reserves
The Council will maintain a designated reserve of 100% of annual budgeted expenditures for the following purposes:

- To protect the Council against unforeseen economic emergencies with respect to its operations; and
- To provide financial support for special initiatives that are beyond the means of the annual operating budget.

Rights and responsibilities

The board is responsible for periodically reviewing and recommending amendments, if any, to the Reserve Policy. The voting membership is responsible for approving the Reserve Policy and any subsequent amendments to the policy.

The board and the voting membership shall approve expenditures that exceed 10% of the reserve and are intended to fund special initiatives beyond the means of the member-approved annual budget, not simply to cover operating losses. The board shall annually disclose to the voting membership the status of the designated reserve, and any plans or efforts to replenish expenditures from it, when the board proposes the annual budget for member review and approval.

Reporting

The board directs the executive director to coordinate the preparation of an annual report on the designated reserve and any additional reserves for the treasurer to present to the board and voting membership.

DISCUSSION

The CII board approved the current Reserve Policy on Jan. 12, 2007, and General Members (now known as U.S. Asset Owners) approved it on March 20, 2007. The Reserve Policy is one of the few board operating policies that require voting member approval (if amended). The board Audit Committee is responsible for reviewing the policy periodically and recommending any changes to the board.

The board-designated reserve for 2020 is $5,646,750 (1.5 x 2019 total budgeted expenses).

The recommended changes are both substantive and stylistic, with the aim of making the policy more concise and practical.

1. Purpose: The proposed wording is more in keeping with the purpose of a board-designated reserve-to be a "rainy day" fund for times of economic or organizational stress, and a source of additional funds for out-of-the-ordinary initiatives that the board believes CII should undertake. It is generally not to fund day-to-day operations.

2. Board-designated reserve equivalent to 100% of total annual operating expenses: The board recommends lowering this fom 150% to 100% of annual operating expenses for two reasons.

First, year-end net assets have been below the board-designated reserve for two consecutive years and that trend is likely to continue at least for a year or two. A key factor has been growing pension expense due to declines in the discount rate and to actuarial changes. Both are hard to predict and control. Looking ahead, we anticipate an operating loss next year from a likely decline in membership revenues. Of note, however, our auditor does not believe the fact that total net assets are lower than the board-designated reserve is an issue given CII's significant total reserve

Second, CII's reserve is extremely conservative relative to other nonprofit associations. Prudence is sensible as CII has significant long-term liabilities. These include rent payments on our office lease, which runs through Aug. 31, 2023; financial penalties we would owe under existing hotel contracts for spring and fall conferences were we to cancel today; and our staff defined benefit pension plan obligation (see details below). But setting the designated reserve amount at 1.5 times budgeted expenses makes CII an outlier.

Office lease commitments (excludes operating & tax costs)	:	$ 568,508
Total penalties for breaking existing hotel contracts		$1,633,209
Pension benefit obligation (as of 12/31/19)		$5,391,859

A 2019 survey by the American Society of Association Executives (ASAE) found that of associations with budgets of $1-4 million (similar to CII), only 16.2% maintained a reserve equal to 150% or more of budgeted expenses, while 63.2% maintained reserves equal to less than one year of budgeted expenses. Our auditor has told us that six to 12 months of expenses is more common for a nonprofit of CII's size.

Indeed, when staff informally surveyed other organizations we interact with, that is mostly what we learned they do:

- National Association of State Retirement Administrators (NASRA)
  NASRA has an operating reserve in the yearly budget for unforeseen circumstances within the budget cycle and an Executive Committee Designated Reserve. The operating reserve is equal to one month's average operating expense (including conference costs) and the Designated Reserve is equal to six months average operating expense (including conference costs).

- National Conference on Public Employee Retirement Systems (NCPERS)

NCPERS does not have a formal reserve policy. But in practice, it maintains reserves equal to annual expenses.

- The Forum for Sustainable and Responsible Investment (US SIF)
  US SIF maintains a reserve equal to six months of budgeted expenses.

- Society for Corporate Governance
  The Society has an operating cash reserve equal to six months of budgeted expenses, and a board-designated reserve for additional reserves (a lesser amount).

3. Rights and responsibilities: The suggested wording changes bring the policy in line with practice and practicality.

The CII board designates review of the Reserve Policy to the Audit Committee, which reviews the policy at least once every three years. This timetable seems more practical than reviewing the policy annually.

The reserve is board-designated and member-approved. The board believes it is appropriate for voting members as well as the board to approve expenditures exceeding 10% of the reserve for a special initiative other than covering operating losses. The revised wording also gives the board flexibility on whether to replenish the amount expended, in view of CII's ample total reserves.

Requiring the board to report on drawdowns from the reserve and plans to replenish-or not-those funds at the time when members approve the annual budget provides an appropriate level of governance and oversight.

4. Excess investments: Funds in excess of the board-designated reserve are working capital.

APPENDIX 5
APPROVE STATEMENT ON DISCLOSURE OF SUSTAINABILITY PERFORMANCE

The board recommends adoption of the following new statement as CII policy:

Statement on Corporate Disclosure of Sustainability Performance

Investors increasingly seek decision-useful, comparable and reliable information about sustainability performance in corporate disclosures in order to better understand how nonfinancial metrics can impact business and profitability. CII believes that independent, private sector standard setters should have the central role in helping companies fill that need. Market participants, non-governmental organizations and governments can aid the success of these standard setters by supporting their independence and long-term viability, attributes of which include: stable and secure funding; deep technical expertise at both the staff and board levels; accountability to investors; open and rigorous due process for the development of new standards; and adequate protection from external interference.

CII encourages companies to disclose standardized metrics established by independent, private sector standard setters along with reporting mandated by applicable securities regulations to better ensure investors have the information they need to make informed investment and proxy voting decisions. CII believes those standards that focus on materiality, and take into account appropriate sector and industry considerations, are more likely to meet investors' needs for useful and comparable information about sustainability performance. CII also believes that over time, companies should obtain external assurance of the sustainability performance information they provide.

Background & Intent

Across the broad range of market participants, consensus is growing that the future of corporate reporting involves standardized disclosure of practices and performance related to long-term sustainability. For many companies that are already disclosing standardized sustainability data using one or more sustainability frameworks, the future is already here.

Lessons from the experience with standardized financial reporting are important to consider as standardized "non-financial" reporting takes shape. Consistent with CII's Statement on Accounting and Auditing Standard Setters, the proposed statement primarily communicates the vital role of independent standard setting, operating at arm's length from the companies that comply with those standards and the regulators that may endorse those standards. There is little benefit to standardization if those standards mirror the preferences of one or more interested parties.

While the proposed language recognizes that standards that take into account appropriate sector and industry considerations are more likely to meet investors' needs, the statement importantly does not foreclose the use of market-wide standards when appropriate.

The statement's development, including the decision not to explicitly endorse any particular framework at this time, was informed in part by a CII Research and Education Fund (CII-REF) publication, Chief Investment Officer's guide to corporate sustainability reporting frameworks, which describes key differences among prominent frameworks. CII recognizes that various frameworks co-exist in part because they fundamentally serve a variety of objectives.

The statement aligns with CII's Statement on Company Disclosure, which establishes parameters by which CII evaluates whether to support proposals to expand company disclosure, whether that expansion would apply to the "financial" or "non-financial" category. Those four factors are:

- Materiality to investment and voting decisions
- Depth, consistency and reliability of empirical evidence supporting the connection between the disclosure and long-term shareowner value
- Anticipated benefit to investors, net of the cost of collection and reporting
- Prospect of substantially improving transparency, comparability, reliability and accuracy

APPENDIX 6
APPROVE AMENDMENTS TO POLICY ON PCAOB ENFORCEMENT ACTION TRANSPARENCY

The board recommends amending Section 2.13a of CII policy to explicitly include enforcement actions as a factor for consideration by the audit committee when considering the appropriateness of periodically changing the external auditor, as follows:
The [audit] committee should consider the appropriateness of periodically changing the auditor, bearing in mind factors that include, but are not limited to:
…

- … *enforcement actions (in process or completed)*, inspection results and fines levied by the Public Company Accounting Oversight Board or other regulators

Background and Intent

Enforcement actions undertaken by the SEC are made transparent from the time legal proceedings begin—that is, after an agency investigation concludes with the filing of a legal complaint against the company. (In practice, SEC actions can be disclosed even earlier, if a public company files an 8-K indicating it has received a Wells Notice from the SEC indicating the commission plans to bring an enforcement action against the company.)

In contrast, statutory language in the Sarbanes-Oxley Act (SOX) ensures that PCAOB enforcement actions are far less transparent. Under that language, PCAOB enforcement proceedings are nonpublic, unless the PCAOB finds there is good cause for a proceeding to be public *and* parties consent to public proceedings.

The practical result is that PCAOB enforcement proceedings are nonpublic. Even audit committee members can be kept unaware of ongoing PCAOB enforcement activity involving the companies audited by firms they are charged with overseeing.

The proposed amendment would give CII authority to advocate for public policy reforms supporting transparency after a PCAOB investigation concludes there is sufficient grounds to proceed with disciplinary or other legal proceedings and the board votes to initiate formal disciplinary action. This amendment should not be read to place any expectation on audit committees to obtain information to which they currently do not have access.

APPENDIX 7
APPROVE REVISED POLICY ON AUDITOR RATIFICATION OUTCOMES

The board recommends the following revisions to Section 2.13f of CII policies, as shown below, to strengthen the threshold at which companies should seek shareholder input following an auditor ratification vote.

2.13f Shareowner Votes on the Board's Choice of Outside Auditor: Audit committee charters should provide for annual shareowner votes on the board's choice of independent, external auditor. ~~Such provisions should state that~~ In practice, if the board's selection fails to achieve the support of a significant majority, such as 80%, of the for-and-against votes cast, the audit committee should: (1) solicit the views of major shareowners to determine why ~~broad levels of shareowner support were not achieved~~ a meaningful minority of shareowners dissented from ratification ~~take the shareowners' views into consideration and reconsider its choice of auditor~~ and (2) take the shareowners' views into consideration and reconsider its choice of auditor.
~~solicit the views of major shareowners to determine why broad levels of shareowner support were not achieved~~

Background & Intent

Although it is exceedingly rare for auditor ratification votes to receive less than majority support, existing CII policy portrays that threshold as the appropriate point for audit committees to respond substantively to the outcome of the vote. There is some precedent for a substantive response at 80%, notably in the U.K. Corporate Governance Code, which applies more broadly than auditor ratification.

The proposed language is meant to strengthen guidance for boards on when to respond to low auditor ratification support, while providing room for discretion in light of company-specific circumstances. For example, a company with a perennial history of 99% support may find a substantive response appropriate if support suddenly falls to 85%. In part for this reason, the amended language intentionally avoids placing an expectation on companies to amend their audit committee charters to formalize their particular practices.

The proposed language inverts the order of the two recommended board actions after a low vote to reflect the most sensible chronology of those follow-up actions.

APPENDIX 8
APPROVE POLICY ON ELECTRONIC MEANS FOR SHAREHOLDERS TO CORRESPOND WITH BOARDS

The board recommends revising Section 2.6b of CII policies, as shown below, to encourage companies to provide an email address for shareholders to correspond with the board.

2.6b Interaction with Shareowners

Directors should respond to communications from shareowners and should seek shareowner views on important governance, management and performance matters. To accomplish this goal, all companies should establish board-shareowner communications policies. Such policies should disclose the ground rules by which directors will meet with shareowners. The policies should also include ~~detailed~~ postal mail and email contact information for at least one independent director (but preferably for the independent board chair and/or the independent lead director and the independent chairs of the audit, compensation and nominating committees). Companies should also establish mechanisms by which shareowners with non-trivial concerns can communicate directly with all directors. Policies requiring that all director communication go through a member of the management team should be avoided unless they are for record-keeping purposes. In such cases, procedures documenting receipt and delivery of the request to the board and its response must be maintained and made available to shareowners upon request. Directors should have access to all communications. Boards should determine whether outside counsel should be present at meetings with shareowners to monitor compliance with disclosure rules.

Background & Intent

Shareholder correspondence with the board is a widely accepted practice among publicly traded companies. With the small proposed modification to existing policy highlighted above, CII would seek disclosure of both a postal and email address from which the corporate secretary or another designee collects and processes correspondence from shareholders.

During the Covid pandemic, some investors, including some members of CII, experienced difficulty corresponding with company boards because contact information was limited to a postal address. CII's own board outreach initiatives, traditionally carried out by postal mail, experienced these challenges as well.

APPENDIX 9
APPROVE AMENDMENTS TO POLICY ON VIRTUAL-ONLY SHAREHOLDER MEETINGS

The board recommends amending Section 4.7 of CII policy, as shown below, providing flexibility for companies to hold virtual-only shareholder meetings in situations where providing a hybrid or in-person meeting would require postponing or delaying the meeting date. This revision is considered the first half of a two-step exploration of CII's positioning with respect to virtual-only shareholder meetings.

4.7 Electronic meetings

Except in circumstances where providing an in-person option would necessitate postponing or delaying the meeting date, companies should hold shareowner meetings by remote communication (so-called "virtual" meetings) only as a supplement to traditional in-person shareowner meetings, not as a substitute.

Companies incorporating virtual technology into their shareowner meeting should use it as a tool for broadening, not limiting, shareowner meeting participation. With this objective in mind, a virtual option, if used, should facilitate the opportunity for remote attendees to participate in the meeting to the same degree as in-person attendees.

Virtual-only shareholder meetings do not exist in a virtual vacuum. Any bona fide shareholder who desires to be in the physical room from which the chair conducts a virtual-only meeting should have the choice to do so, provided the shareholder complies with reasonable admission requirements.

Background and Intent

Existing CII policy encourages shareholder meetings to take place either in a hybrid format (a virtual option coupled with an in-person option) or a traditional in-person format. This position is motivated largely by concern about the quality and transparency of virtual meeting platforms, particularly with respect to the administration of Q&A. The policy also represents a certain perspective on corporate culture: When leadership avails itself once a year to responding eye-to-eye to unfiltered input from shareholders of any size, it communicates certain values throughout the enterprise including openness to ideas, tolerance for candor and respect.

Read literally, the current policy does not accommodate extraordinary circumstances such as the Covid-19 pandemic, in which an in-person element could jeopardize attendees' health and/or compliance with government-prescribed stay-at-home orders. The proposed revision would afford flexibility for the virtual-only format in situations where providing a hybrid or in-person meeting would require postponing or delaying the meeting date.

Along these lines, CII on March 16 issued a press release stating that "given Coronavirus concerns, it is entirely reasonable that some companies will go to virtual-only annual meetings." However, the statement continued, "CII hopes that companies will make it clear that this decision is a one-off, tailored for current circumstances." The press release also provided a series of suggested practices for strengthening the virtual element of a shareholder meeting, which were first published in a 2017 CII publication, Build a Better Meeting.

CII understands that most companies using the virtual-only format in 2020 were doing so for the first time, on short notice, which impaired their ability to provide the level of quality they might otherwise have delivered. Looking forward, CII recognizes that both companies and investors have an interest in improving the quality of virtual-only meetings. CII currently intends to consider after Proxy Season 2021 whether to further revise CII policy in a way that could accommodate the virtual-only format in cases where companies have put in place certain measures to ensure a high-quality meeting.

LACERA

FOR INFORMATION ONLY

September 28, 2020

TO: Each Trustee
Board of Retirement
Board of Investments

FROM: Barry W. Lew
Legislative Affairs Officer

FOR: October 7, 2020 Board of Retirement Meeting
October 14, 2020 Board of Investments Meeting

SUBJECT: **Monthly Status Report on Legislation**

Attached is the monthly report on the status of legislation that staff is monitoring or on which LACERA has adopted a position.

Reviewed and Approved:

Steven P. Rice, Chief Counsel

Attachments
LACERA Legislative Report Index
LACERA Legislative Report

cc: Santos H. Kreimann
JJ Popowich
Steven P. Rice
Jon Grabel
Anthony J. Roda, Williams & Jensen
Joe Ackler, Ackler & Associates

File name: CERL-PEPRA-2020

CA AB 2101

AUTHOR: Public Employment and Retirement Cmt
TITLE: Public Employees Retirement
INTRODUCED: 02/06/2020
LAST AMEND: 08/07/2020
DISPOSITION: To Governor
SUMMARY:

Amends existing law relating to the State Teachers' Retirement System. Removes the requirement that the election for continued defined benefit coverage be filed with the other public retirement system. Includes as creditable service activities performed for an employer by an audiometrist who holds a certificate of registration issued by the State Department of Health Care Services. Defines leave of absence.

STATUS:

09/10/2020 *****To GOVERNOR.

CA AB 2937

AUTHOR: Fong [R]
TITLE: CERL: Non-Service-Connected Disability Retirement
INTRODUCED: 02/21/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Creates an optional provision, to be elected by a county board of supervisors by resolution adopted by majority vote, that would remove the retirement board's assessment regarding the intemperate use of alcoholic liquor or drugs as a condition on the purchase of a disability retirement pension by county or district contributions.

STATUS:

03/05/2020 To ASSEMBLY Committee on PUBLIC EMPLOYMENT AND RETIREMENT.

Comments:

SACRS-sponsored bill based on LACERA's proposal.

BOR_Position: Support *04/09/2020*
Staff_Recommendation: Support

CA SB 430

AUTHOR: Wieckowski [D]
TITLE: Public Employees Retirement Benefits: Judges
INTRODUCED: 02/21/2019
LAST AMEND: 05/17/2019
DISPOSITION: Failed - Adjourned
SUMMARY:

Relates to the State Public Employees' Pension Reform Act of 2013. Grants a judge who was elected to office in a specific year the option of making a one-time, irrevocable election to have a membership status prior to a certain date in the Judges' Retirement System II for service accrued after a certain date.

STATUS:

06/26/2019 In ASSEMBLY Committee on PUBLIC EMPLOYMENT AND RETIREMENT: Not heard.

Staff_Action: Monitoring

CA SB 783

AUTHOR: Labor, Public Employment & Retirement Cmt

TITLE: County Employees Retirement Law of 1937
INTRODUCED: 03/07/2019
DISPOSITION: Failed - Adjourned
SUMMARY:

Corrects several erroneous and obsolete cross references within the County Employees Retirement Law of 1937.

STATUS:

05/16/2019 To ASSEMBLY Committee on PUBLIC EMPLOYMENT AND RETIREMENT.

Comments:

SB 783 was folded into AB 2101 to create a combined clean-up bill with CalPERS and CalSTRS.

Staff_Action: Monitoring

CA SB 1297

AUTHOR: Moorlach [R]
TITLE: Public Employees' Retirement
INTRODUCED: 02/21/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Relates to the Public Employees' Retirement System, the State Teachers' Retirement System, the Judges' Retirement System, the Judges' Retirement System II, county and district retirement systems created pursuant to the County Employees' Retirement Law of 1937. Revises the provision of pension and other benefits to members of all state or local public retirement systems, among others.

STATUS:

03/05/2020 To SENATE Committee on LABOR, PUBLIC EMPLOYMENT AND RETIREMENT.

Staff_Action: Monitoring

CA SB 1371

AUTHOR: Judiciary Cmt
TITLE: Maintenance of the Codes
INTRODUCED: 02/21/2020
DISPOSITION: To Governor
SUMMARY:

Makes nonsubstantive changes in various provisions relative to directing the Legislative Counsel to advise the Legislature from time to time as to legislation necessary to maintain the Codes.

STATUS:

09/10/2020 *****To GOVERNOR.

Comments:

Makes nonsubstantive change to CERL Section 31631.5 per Legislative Counsel's recommendation.

Staff_Action: Monitoring

File name: FEDERAL-Covid-19

US HR 266

SPONSOR: McCollum [D]
TITLE: Paycheck Protection Program and Health Care Enhancement
INTRODUCED: 01/08/2019
LAST AMEND: 04/21/2020
DISPOSITION: Enacted
SUMMARY:

Makes amendments to the Paycheck Protection Program, economic injury disaster loans, and emergency grants pursuant to the Coronavirus Aid, Relief, and Economic Security Act; relates to small business programs; makes additional emergency appropriations for coronavirus response.

STATUS:

04/23/2020 *****To PRESIDENT.
04/24/2020 Signed by PRESIDENT.
04/24/2020 Public Law No. 116-139

US HR 748

SPONSOR: Courtney [D]
TITLE: CARES Act
INTRODUCED: 01/24/2019
LAST AMEND: 03/25/2020
DISPOSITION: Enacted
SUMMARY:

Enacts the Coronavirus Aid, Relief, and Economic Security, or CARES, Act; provides emergency assistance and health care response for individuals, families, and businesses affected by the 2020 coronavirus pandemic.

STATUS:

03/27/2020 In HOUSE. HOUSE concurred in SENATE amendments.
03/27/2020 *****To PRESIDENT.
03/27/2020 Signed by PRESIDENT.
03/27/2020 Public Law No. 116-136

US HR 6074

SPONSOR: Lowey [D]
TITLE: Coronavirus Preparedness and Response Appropriations
INTRODUCED: 03/04/2020
DISPOSITION: Enacted
SUMMARY:

Establishes the Coronavirus Preparedness and Response Supplemental Appropriations Act; makes emergency supplemental appropriations in response to the outbreak of the Coronavirus.

STATUS:

03/06/2020 Public Law No. 116-123

US HR 6201

SPONSOR: Lowey [D]
TITLE: Families First Coronavirus Response Act
INTRODUCED: 03/11/2020
LAST AMEND: 03/14/2020
DISPOSITION: Enacted
SUMMARY:

Provides for the Families First Coronavirus Response Act; provides specified supplement appropriations.

STATUS:

03/18/2020 Public Law No. 116-127

US HR 6800

SPONSOR: Lowey [D]
TITLE: HEROES Act
INTRODUCED: 05/12/2020
DISPOSITION: Pending
SUMMARY:

Provides for the HEROES Act.

STATUS:

07/23/2020 In SENATE Committee on SMALL BUSINESS AND

		ENTREPRENEURSHIP: Hearings held.
	Staff_Action:	Monitoring

US S 3607	**SPONSOR:**	Grassley [R]
	TITLE:	Public Safety Officer Death Benefits
	INTRODUCED:	05/05/2020
	LAST AMEND:	05/14/2020
	DISPOSITION:	Enacted
	SUMMARY:	

Extends public safety officer death benefits to public safety officers whose death is caused by COVID-19.

STATUS:

08/14/2020	Public Law No. 116-157
Staff_Action:	Monitoring

US S 3608	**SPONSOR:**	Kennedy [R]
	TITLE:	CARES Act Funds Flexibility
	INTRODUCED:	05/05/2020
	DISPOSITION:	Pending
	SUMMARY:	

Amends the CARES Act; provides flexibility in use of funds by states, Indian Tribes, and municipalities.

STATUS:

05/05/2020	INTRODUCED.
05/05/2020	In SENATE. Read second time.
05/05/2020	To SENATE Committee on APPROPRIATIONS.

Comments:

Would prohibit any federal aid to be provided directly to state pension funds.

Staff_Action:	Monitoring

US S 3752	**SPONSOR:**	Menendez [D]
	TITLE:	Coronavirus Local Community Stabilization Fund
	INTRODUCED:	05/18/2020
	DISPOSITION:	Pending
	SUMMARY:	

Amends Title VI of the Social Security Act; establishes a Coronavirus Local Community Stabilization Fund.

STATUS:

06/02/2020	In SENATE Committee on BANKING, HOUSING AND URBAN AFFAIRS: Hearings held.

Comments:

Would prohibit use of federal funds authorized by this bill by states for pension funds.

Staff_Action:	Monitoring

US S 4317	**SPONSOR:**	Cornyn [R]
	TITLE:	SAFE TO WORK Act
	INTRODUCED:	07/27/2020
	DISPOSITION:	Pending
	SUMMARY:	

Provides for the SAFE TO WORK Act.

STATUS:

07/27/2020	INTRODUCED.

	07/27/2020	In SENATE. Read second time.
	07/27/2020	To SENATE Committee on JUDICIARY.

Comments:

One of eight individual bills that is part of the Health, Economic Assistance, Liability Protection and Schools Act (HEALS Act).

Staff_Action: Monitoring

US S 4318

SPONSOR: Grassley [R]
TITLE: American Workers Families and Employers Assistance Act
INTRODUCED: 07/27/2020
DISPOSITION: Pending
SUMMARY:

Provides for the American Workers, Families, and Employers Assistance Act.

STATUS:

07/27/2020	INTRODUCED.
07/27/2020	In SENATE. Read second time.
07/27/2020	To SENATE Committee on FINANCE.

Comments:

One of eight individual bills that is part of the Health, Economic Assistance, Liability Protection and Schools Act (HEALS Act).

Staff_Action: Monitoring

US S 4319

SPONSOR: Scott T [R]
TITLE: Supporting Americas Restaurant Workers Act
INTRODUCED: 07/27/2020
DISPOSITION: Pending
SUMMARY:

Provides for the Supporting America's Restaurant Workers Act.

STATUS:

07/27/2020	INTRODUCED.
07/27/2020	In SENATE. Read second time.
07/27/2020	To SENATE Committee on FINANCE.

Comments:

One of eight individual bills that is part of the Health, Economic Assistance, Liability Protection and Schools Act (HEALS Act).

Staff_Action: Monitoring

US S 4320

SPONSOR: Shelby [R]
TITLE: Coronavirus Response Supplemental Appropriations
INTRODUCED: 07/27/2020
DISPOSITION: Pending
SUMMARY:

Provides for the Coronavirus Response Additional Supplemental Appropriations Act, 2020.

STATUS:

07/27/2020	INTRODUCED.
07/27/2020	In SENATE. Read second time.
07/27/2020	To SENATE Committee on APPROPRIATIONS.

Comments:

One of eight individual bills that is part of the Health, Economic Assistance, Liability Protection and Schools Act (HEALS Act).

Staff_Action: Monitoring

US S 4321

SPONSOR: Rubio [R]
TITLE: Continuing Small Business Recovery
INTRODUCED: 07/27/2020
DISPOSITION: Pending
SUMMARY:

Provides for the Continuing Small Business Recovery and Paycheck Protection Program Act.

STATUS:

07/27/2020 INTRODUCED.
07/27/2020 In SENATE. Read second time.
07/27/2020 To SENATE Committee on SMALL BUSINESS AND ENTREPRENEURSHIP.

Comments:

One of eight individual bills that is part of the Health, Economic Assistance, Liability Protection and Schools Act (HEALS Act).

Staff_Action: Monitoring

US S 4322

SPONSOR: Alexander L [R]
TITLE: Safely Back to School and Back to Work Act
INTRODUCED: 07/27/2020
DISPOSITION: Pending
SUMMARY:

Provides for the Safely Back to School and Back to Work Act.

STATUS:

07/27/2020 INTRODUCED.
07/27/2020 In SENATE. Read second time.
07/27/2020 To SENATE Committee on HEALTH, EDUCATION, LABOR AND PENSIONS.

Comments:

One of eight individual bills that is part of the Health, Economic Assistance, Liability Protection and Schools Act (HEALS Act).

Staff_Action: Monitoring

US S 4323

SPONSOR: Romney [R]
TITLE: TRUST Act of 2020
INTRODUCED: 07/27/2020
DISPOSITION: Pending
SUMMARY:

Provides for the TRUST Act of 2020.

STATUS:

08/03/2020 In SENATE. Discharged from SENATE Committee on FINANCE.
08/03/2020 To SENATE Committee on HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS.

Comments:

One of eight individual bills that is part of the Health, Economic Assistance, Liability Protection and Schools Act (HEALS Act).

Staff_Action: Monitoring

US S 4324

SPONSOR: Graham [R]
TITLE: Critical Supply Chains and Intellectual Property Act
INTRODUCED: 07/27/2020
DISPOSITION: Pending

SUMMARY:

Provides for the Restoring Critical Supply Chains and Intellectual Property Act.

STATUS:

07/27/2020 INTRODUCED.
07/27/2020 In SENATE. Read second time.
07/27/2020 To SENATE Committee on FINANCE.

Comments:

One of eight individual bills that is part of the Health, Economic Assistance, Liability Protection and Schools Act (HEALS Act).

Staff_Action: Monitoring

File name: Federal-2020

US HR 141

SPONSOR: Davis R [R]
TITLE: Government Pension Offset Repeal
INTRODUCED: 01/03/2019
DISPOSITION: Pending
SUMMARY:

Amends Title II of the Social Security Act; repeals the Government pension offset and windfall elimination provisions.

STATUS:

01/31/2019 In HOUSE Committee on WAYS AND MEANS: Referred to Subcommittee on SOCIAL SECURITY.

BOR_Position: Support *04/11/2019*
IBLC_Recommendation: Support *03/14/2019*
Staff_Recommendation: Support

US HR 3934

SPONSOR: Brady K [R]
TITLE: Windfall Elimination Provision Replacement
INTRODUCED: 07/24/2019
DISPOSITION: Pending
SUMMARY:

Amends Title II of the Social Security Act; replaces the windfall elimination provision with a formula equalizing benefits for certain individuals with non-covered employment.

STATUS:

07/24/2019 INTRODUCED.
07/24/2019 To HOUSE Committee on WAYS AND MEANS.

BOR_Position: Support *02/05/2020*
IBLC_Recommendation: Watch *01/09/2020*
Staff_Recommendation: Watch

US HR 4540

SPONSOR: Neal [D]
TITLE: Non Covered Employment Social Security Provision
INTRODUCED: 09/27/2019
DISPOSITION: Pending
SUMMARY:

Provides an equitable Social Security formula for individuals with non covered employment; provides relief for individuals currently affected by the Windfall Elimination Provision.

STATUS:

09/27/2019 INTRODUCED.
09/27/2019 To HOUSE Committee on WAYS AND MEANS.

BOR_Position: Support *02/05/2020*

IBLC_Recommendation: Watch *01/09/2020*
Staff_Recommendation: Watch

US HR 4897
SPONSOR: Lipinski [D]
TITLE: Governmental Retirement Plans Income
INTRODUCED: 10/29/2019
DISPOSITION: Pending
SUMMARY:

Amends the Internal Revenue Code; increases the amount excluded from gross income by reason of distributions from governmental retirement plans for health and long term care insurance for public safety officers.

STATUS:

10/29/2019 INTRODUCED.
10/29/2019 To HOUSE Committee on WAYS AND MEANS.

Comments:

Would increase the current Public Safety Officer tax exclusion from $3,000 to $6,000.

Staff_Action: Monitoring

US HR 6436
SPONSOR: Chabot [R]
TITLE: Health Plans Direct Payment Requirement
INTRODUCED: 04/03/2020
DISPOSITION: Pending
SUMMARY:

Amends the Internal Revenue Code; repeals the direct payment requirement on the exclusion from gross income of distributions from governmental plans for health and long term care insurance.

STATUS:

04/03/2020 INTRODUCED.
04/03/2020 To HOUSE Committee on WAYS AND MEANS.

BOR_Position: Support *07/01/2020*
IBLC_Position: Support *06/11/2020*
Staff_Recommendation: Support

US S 521
SPONSOR: Brown S [D]
TITLE: Government Pension Offset Repeal
INTRODUCED: 02/14/2019
DISPOSITION: Pending
SUMMARY:

Amends Title II of the Social Security Act; repeals the Government pension offset and windfall elimination provisions.

STATUS:

02/14/2019 INTRODUCED.
02/14/2019 In SENATE. Read second time.
02/14/2019 To SENATE Committee on FINANCE.

BOR_Position: Support *04/11/2019*
IBLC_Recommendation: Support *03/14/2019*
Staff_Recommendation: Support

File name: Other-2020

CA AB 992
AUTHOR: Mullin [D]
TITLE: Open Meetings: Local Agencies: Social Media
INTRODUCED: 02/21/2019

LAST AMEND: 07/31/2020
DISPOSITION: Enacted
SUMMARY:

Allows a member to engage in separate conversations or communications outside of a meeting authorized by the Ralph M. Brown Act with any other person using an internet based social media platform to answer questions, provide information to the public, or to solicit information from the public regarding a matter that is within the subject matter jurisdiction of the legislative body.

STATUS:

09/18/2020 Chaptered by Secretary of State. Chapter No. 2020-89

Staff_Action: Monitoring

CA AB 1945

AUTHOR: Salas [D]
TITLE: Emergency Services: First Responders
INTRODUCED: 01/17/2020
LAST AMEND: 06/29/2020
DISPOSITION: Enacted
SUMMARY:

Defines first responder, for purposes of the California Emergency Services Act, to include certain personnel. Provides that the definition of first responder does not confer a right to an employee to obtain a retirement benefit formula for an employment classification that is not included in, or is expressly excluded from, that formula.

STATUS:

09/11/2020 Chaptered by Secretary of State. Chapter No. 2020-68

Staff_Action: Monitoring

CA AB 2452

AUTHOR: Garcia [D]
TITLE: State Auditor: Audits: High Risk Local Government
INTRODUCED: 02/19/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Authorizes the State Auditor to include in the high risk local government agency audit program any local agency or district association that the State Auditor identifies as being at high risk for the potential of waste, fraud, abuse, or mismanagement or that has major challenges associated with its economy, efficiency, or effectiveness.

STATUS:

02/27/2020 To ASSEMBLY Committee on ACCOUNTABILITY AND ADMINISTRATIVE REVIEW.

Staff_Action: Monitoring

CA AB 2473

AUTHOR: Cooper [D]
TITLE: Public Investment Funds
INTRODUCED: 02/19/2020
LAST AMEND: 07/28/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Exempts from disclosure under California Public Records Act specified records regarding an internally managed private loan made directly by a public investment fund, including quarterly and annual financial statements of the borrower or its constituent owners, unless the information has already been publicly released by the keeper of the information. Makes nonsubstantive changes to certain other provisions. Defines terms.

STATUS:

08/05/2020 In SENATE Committee on LABOR, PUBLIC EMPLOYMENT AND RETIREMENT: Not heard.

Staff_Action: Monitoring

CA AB 3249

AUTHOR: Fong [R]

TITLE: Public Retirement: Controller: Annual Report

INTRODUCED: 02/21/2020

DISPOSITION: Failed - Adjourned

SUMMARY:

Requires the Controller to post the report on the financial condition of all state and local public retirement systems on the Controller's internet website.

STATUS:

03/09/2020 To ASSEMBLY Committee on PUBLIC EMPLOYMENT AND RETIREMENT.

Staff_Action: Monitoring

CA ACA 5

AUTHOR: Weber [D]

TITLE: Government Preferences

INTRODUCED: 01/18/2019

LAST AMEND: 05/04/2020

DISPOSITION: Adopted

SUMMARY:

Proposes an amendment to the state Constitution to repeal provisions enacted by the initiative Proposition 209 which prohibits the state from discriminating against, or granting preferential treatment to, any individual or group on the basis of race, sex, color, ethnicity, or national origin, in the operation of public employment, public education, or public contracting.

STATUS:

06/25/2020 Chaptered by Secretary of State.

06/25/2020 Resolution Chapter No. 2020-23

Comments:

On the Nov. 3, 2020 ballot as Proposition 16.

Staff_Action: Monitoring

CA SB 931

AUTHOR: Wieckowski [D]

TITLE: Local Government Meetings: Agenda and Documents

INTRODUCED: 02/05/2020

LAST AMEND: 04/02/2020

DISPOSITION: Failed - Adjourned

SUMMARY:

Requires, if the local agency has an internet website to deliver by email the agendas and documents for local government meetings. Require, where the local agency determines it is technologically infeasible to send a copy of all documents constituting the agenda packet or a website link containing the documents by electronic mail or by other electronic means.

STATUS:

04/02/2020 From SENATE Committee on GOVERNANCE AND FINANCE with author's amendments.

04/02/2020 In SENATE. Read second time and amended. Re-referred to Committee on GOVERNANCE AND FINANCE.

Staff_Action: Monitoring

File name: STATE-Covid-19

CA AB 196

AUTHOR: Gonzalez [D]
TITLE: Workers' Compensation: Coronavirus
INTRODUCED: 01/10/2019
LAST AMEND: 08/25/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Defines injury for certain employees who are employed in an occupation or industry deemed essential except as specified, or who are subsequently deemed essential, to include coronavirus disease that develops or manifests itself during a period of employment of those persons in the essential occupation or industry. Creates a disputable presumption that the injury arose out of and in the course of the employment. Shortens the investigatory timeframe.

STATUS:

09/01/2020 In SENATE. From third reading. To Inactive File.

Staff_Action: Monitoring

CA AB 664

AUTHOR: Cooper [D]
TITLE: Workers' Compensation: Injury: Communicable Disease
INTRODUCED: 02/15/2019
LAST AMEND: 08/25/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Defines injury, for certain state and local firefighting personnel, peace officers, correctional and law enforcement personnel, health care employees who provide direct patent care at an acute care hospital, and fire and rescue services coordinators who work for the Office of Emergency Services to include illness or death resulting from COVID 19 that is diagnosed on or after a specified date, if certain circumstances apply.

STATUS:

08/26/2020 In SENATE. Read second time. To third reading.

Comments:

As amended on 4/17/2020, the bill no longer relates to disability retirement and relates to a presumption under workers' compensation.

BOR_Position: Oppose *06/05/2019*, Support *05/01/2019*
IBLC_Recommendation: Support *04/11/2019*
Staff_Action: Monitoring
Staff_Recommendation: Watch

CA AB 685

AUTHOR: Reyes [D]
TITLE: COVID 19: Imminent Hazard to Employees: Exposure
INTRODUCED: 02/15/2019
LAST AMEND: 08/25/2020
DISPOSITION: Enacted
SUMMARY:

Authorizes the Division of Occupational Safety and Health, when, in its opinion, a place of employment, operation, or process, or any part thereof, exposes workers to the risk of infection with severe acute respiratory syndrome, also known as coronavirus, so as to constitute an imminent hazard to employees, to prohibit the performance of that operation or process, or entry into that place of employment.

	STATUS:	
	09/17/2020	Chaptered by Secretary of State. Chapter No. 2020-84

CA AB 1107

AUTHOR: Chu [D]
TITLE: Proclaimed State Emergencies
INTRODUCED: 02/21/2019
LAST AMEND: 08/07/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Requires all proclamations, materials, and announcements made by the Governor or issued by a state agency related to a duly proclaimed state of emergency to be made available statewide in all the threshold languages spoken limited English proficient speakers. Defines the term threshold languages spoken by limited English proficient speakers to mean all MediCal threshold languages spoken by any threshold population group without limitation to county specific thresholds.

STATUS:

08/20/2020 In SENATE Committee on APPROPRIATIONS: Held in committee.

Staff_Action: Monitoring

CA AB 1839

AUTHOR: Bonta [D]
TITLE: Coronavirus Recovery Deal
INTRODUCED: 01/06/2020
LAST AMEND: 05/07/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Enacts the Coronavirus Recovery Deal. Makes a series of legislative findings and declarations pertaining to the coronavirus pandemic and various economic, environmental, and social conditions in the state. States the intent of the Legislature that the state adopt a policy framework with principles and goals committed to accomplish specified economic, environmental, and social objectives and priorities as part of the coronavirus recovery spending.

STATUS:

05/07/2020 From ASSEMBLY Committee on NATURAL RESOURCES with author's amendments.

05/07/2020 In ASSEMBLY. Read second time and amended. Re-referred to Committee on NATURAL RESOURCES.

Comments:

Would support the inclusion of pensions among other benefits that should be included in new employment opportunities for workers in all sectors who have lost jobs or income as a result of the pandemic.

Staff_Action: Monitoring

CA AB 2496

AUTHOR: Choi [R]
TITLE: Income Taxes: Credits: Cleaning Supplies: Coronavirus
INTRODUCED: 02/19/2020
LAST AMEND: 05/04/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Allows a credit against income taxes to a taxpayer that is a business with a physical location in the state in an amount equal to the costs paid or incurred by the qualified taxpayer during the taxable year for the purchase of cleaning and sanitizing supplies used at business locations in the state to prevent the transmission of the novel coronavirus.

STATUS:

05/04/2020	From ASSEMBLY Committee on REVENUE AND TAXATION with author's amendments.
05/04/2020	In ASSEMBLY. Read second time and amended. Re-referred to Committee on REVENUE AND TAXATION.

CA AB 2887

AUTHOR: Bonta [D]
TITLE: Statewide Emergencies: Mitigation
INTRODUCED: 02/21/2020
LAST AMEND: 03/16/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Adds provisions relating to states of emergency, including the coronavirus pandemic. Provides for school meal distribution. Provides a moratorium on rent collection from small businesses. Requires zero interest rate loans for small businesses and nonprofit organizations. Provides paid sick leave for all employees regardless of term of employment. Prohibits the termination of utility service for certain nonpayment after the declaration of a state of emergency.

STATUS:

05/08/2020	In ASSEMBLY. Suspend Assembly Rule 96.
05/08/2020	Re-referred to ASSEMBLY Committee on BUDGET.

Staff_Action: Monitoring

CA AB 3216

AUTHOR: Kalra [D]
TITLE: Unemployment: Rehiring and Retention: Emergency
INTRODUCED: 02/21/2020
LAST AMEND: 08/20/2020
DISPOSITION: To Governor
SUMMARY:

Requires an employer to offer its laid off employees specified information about job positions that become available for which the laid off employees are qualified, and to offer positions to those employees based on a preference system. Defines the term laid off employee. Authorizes an employee to enforce violations by filing an action with the Division of Labor Standards.

STATUS:

09/15/2020	*****To GOVERNOR.

Staff_Action: Monitoring

CA AB 3329

AUTHOR: Daly [D]
TITLE: Unemployment Insurance: Coronavirus Pandemic
INTRODUCED: 02/21/2020
LAST AMEND: 05/04/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Provides that following the termination of the Federal Pandemic Unemployment Compensation amount provided pursuant to the CARES Act, or any other federal supplemental unemployment compensation payments for unemployment due to the coronavirus pandemic, that an individual's weekly benefit amount be increased by a specified amount for the remainder of the duration of time the individual is entitled to receive benefits.

STATUS:

	05/07/2020	In ASSEMBLY Committee on INSURANCE: Not heard.

CA SB 89

AUTHOR: Budget and Fiscal Review Cmt
TITLE: Budget Act
INTRODUCED: 01/10/2019
LAST AMEND: 03/16/2020
DISPOSITION: Enacted
SUMMARY:

Amends the Budget Act to make appropriations for any purpose related to the proclamation of a state of emergency upon order of the Director of Finance; provides that the Administration will work with stakeholders, including members of the Legislature and staff, in developing strategies to be considered for inclusion to assist individuals, nonprofit organizations, and small businesses experiencing economic hardships to the impacts.

STATUS:

03/17/2020 *****To GOVERNOR.
03/17/2020 Signed by GOVERNOR.
03/17/2020 Chaptered by Secretary of State. Chapter No. 2020-02

CA SB 117

AUTHOR: Budget and Fiscal Review Cmt
TITLE: Education Finance
INTRODUCED: 01/10/2019
LAST AMEND: 03/16/2020
DISPOSITION: Enacted
SUMMARY:

Provides that due to the coronavirus, the instructional days and minutes requirements will be deemed to have been met during the period of time the school is closed. Extends the deadline to conduct the English learner assessment, unless otherwise determined by the Superintendent.

STATUS:

03/17/2020 *****To GOVERNOR.
03/17/2020 Signed by GOVERNOR.
03/17/2020 Chaptered by Secretary of State. Chapter No. 2020-03

CA SB 893

AUTHOR: Caballero [D]
TITLE: Workers' Compensation: Hospital Employees
INTRODUCED: 01/28/2020
LAST AMEND: 04/29/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Defines injury, for a hospital employee who provides direct patient care in an acute care hospital, to include infectious diseases, musculoskeletal injuries, and respiratory diseases. Creates rebuttable presumptions that these injuries that develop or manifest in a hospital employee who provides direct patient care in an acute care hospital arose out of and in the course of employment.

STATUS:

05/14/2020 In SENATE Committee on LABOR, PUBLIC EMPLOYMENT AND RETIREMENT: Failed passage.
05/14/2020 In SENATE Committee on LABOR, PUBLIC EMPLOYMENT AND RETIREMENT: Reconsideration granted.

Staff_Action: Monitoring

CA SB 939

AUTHOR: Wiener [D]

TITLE: Emergencies: Coronavirus: Evictions
INTRODUCED: 02/06/2020
LAST AMEND: 05/29/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Prohibits a commercial landlord from serving a specified notice of eviction on a commercial tenant under a certain number of days after the state of emergency proclaimed by the Governor on March 4, 2020, is lifted and if specified criteria apply. Defines eligible COVID 19 impacted commercial tenant. Provides that specified notices of eviction served on commercial tenants are void under specified circumstances.

STATUS:

06/18/2020 In SENATE Committee on APPROPRIATIONS: Held in committee.

Staff_Action: Monitoring

CA SB 943

AUTHOR: Chang [R]
TITLE: Paid Family Leave: Coronavirus
INTRODUCED: 02/10/2020
LAST AMEND: 05/19/2020
DISPOSITION: Failed - Adjourned
SUMMARY:

Authorizes wage replacement benefits to specified workers who take time off work to care for a child or other family member, including a child with disabilities, for whom the employee is responsible for providing care, if that person's school or place of care has been closed, or the care provider of that person is unavailable, due to the coronavirus outbreak.

STATUS:

06/18/2020 In SENATE Committee on APPROPRIATIONS: Held in committee.

Staff_Action: Monitoring

CA SB 1159

AUTHOR: Hill [D]
TITLE: Workers Compensation: Coronavirus: Critical Workers
INTRODUCED: 02/20/2020
LAST AMEND: 08/30/2020
DISPOSITION: Enacted
SUMMARY:

Amends existing law relating to the workers' compensation system. Defines injury for an employee to include illness or death resulting from coronavirus disease. Allows for a presumption of injury for all employees whose fellow employees at their place of employment experience specified levels of positive testing, and whose employer has five or more employees. Requires the Commission on Health and Safety and Worker's Compensation to conduct a COVID 19 impact study.

STATUS:

09/17/2020 Chaptered by Secretary of State. Chapter No. 2020-85

Staff_Action: Monitoring

CA SB 1322

AUTHOR: Rubio [D]
TITLE: Remote Online Notarization Act
INTRODUCED: 02/21/2020
LAST AMEND: 04/03/2020

DISPOSITION: Failed - Adjourned

SUMMARY:

Relates to Remote Online Notarization Act. Authorizes a notary public to apply for registration with the Secretary of State to be a remote online notary public. Provides that the act shall remain in effect only while there is a declaration of a state of emergency by the Governor related to the coronavirus in effect.

STATUS:

05/11/2020 Re-referred to SENATE Committee on JUDICIARY.

Staff_Action: Monitoring

CA 40 2020 **Executive Order**

TITLE: Coronavirus and Workers' Compensation Benefits

ORDERED: 05/06/2020

SUMMARY:

Provides that any coronavirus related illness of an employee shall be presumed to arise out of and in the course of employment for purposes of awarding workers' compensation benefits if the employee tested positive for or was diagnosed with coronavirus within fourteen days after a day that the employee performed labor or services at the employee's place of employment at the employer's direction after a specified date.

Comments:

Governor's Executive Order providing a presumption for workers' compensation benefits due to Covid-19. The order was subsequently codified in SB 1159 (Hill).

LACERA

FOR INFORMATION ONLY

October 1, 2020

TO: Trustees,
Board of Investments

FROM: Steven P. Rice SPR
Chief Counsel

FOR: October 14, 2020 Board of Investments Meeting

SUBJECT: Monthly Status Report on Board of Investments Legal Projects

Attached is the monthly report on the status of Board-directed investment-related projects handled by the Legal Division as of October 1, 2020.

Attachment

c: Santos H. Kreimann
Jonathan Grabel
JJ Popowich
Vache Mahseredjian
John McClelland
Christopher Wagner
Ted Wright
Jim Rice
Jude Perez
Christine Roseland
John Harrington
Soo Park
Margo McCabe
Lisa Garcia

LACERA Legal Division
Board of Investments Projects
Monthly Status Report - Pending as of October 1, 2020

	Project/ Investment	Description	Amount	Board Approval Date	Completion Status	% Complete	Notes
PORTFOLIO ANALYTICS	State Street Bank & Trust Company/Solovis	Agreement for Total Fund Performance Measurement Services	$2,000,000.00	September 9, 2020	In Progress	10%	Legal negotiations in process.
PRIVATE EQUITY	STG VI, LP	Subscription	$100,000,000.00	September 9, 2020	In Progress	75%	Legal negotiations in process.
REAL ASSETS	DWS Pan-European Infrastructure Fund III, LP	Subscription	$120,000,000.00	September 9, 2020	In Progress	25%	Legal negotiations in process.
	Grain Spectrum Holdings III, LP	Subscription	$60,000,000.00	September 9, 2020	In Progress	100%	Completed.
REAL ESTATE	State Street Bank and Trust Company	Agreement for Real Estate Administration Services	$875,000.00	September 9, 2020	In Progress	10%	Legal negotiations in process.

L//.CERA

FOR INFORMATION ONLY

September 23, 2020

TO: Each Trustee
Board of Retirement
Board of Investments

FROM: Ted Granger TG
Interim Chief Financial Officer

FOR: October 7, 2020 Board of Retirement Meeting
October 14, 2020 Board of Investments Meeting

SUBJECT: **MONTHLY EDUCATION & TRAVEL REPORTS – AUGUST 2020**

Attached, for your review, are the Board and Staff Education & Travel Reports as of August 2020. These reports include travel (i.e., completed and canceled) during Fiscal Year 2020-2021.

REVIEWED AND APPROVED:

Santos
____
Santos H. Kreimann
Chief Executive Officer

TG/EW/krh

Attachments

c: J. Popowich
J. Grabel
S. Rice
K. Hines

LACERA

BOARD EDUCATION AND TRAVEL REPORT
FOR FISCAL YEAR 2020 - 2021
AUGUST 2020

Attendee		Purpose of Travel - Location	Event Dates	Travel Status
Elizabeth Ginsberg				
B	-	Edu - CALAPRS Principles for Trustees - Webinar	08/18/2020 - 08/26/2020	Attended
Vivian Gray				
B	-	Edu - SACRS Public Pension Investment Management Program 2020 - Webinar	07/28/2020 - 08/13/2020	Attended
David Green				
B	-	Edu - PPI 2020 Summer Roundtable - Los Angeles CA	07/14/2020 - 07/16/2020	Attended
	-	Edu - Pacific Council - “Beyond the Horizon” Summit - Webinar	07/20/2020 - 07/24/2020	Attended
James Harris				
B	-	Edu - SACRS Sexual Harassment Prevention Training - Webinar	07/15/2020 - 07/15/2020	Attended
	-	Edu - SACRS Public Pension Investment Management Program 2020 - Webinar	07/28/2020 - 08/13/2020	Attended
Keith Knox				
B	-	Edu - PPI 2020 Summer Roundtable - Los Angeles CA	07/14/2020 - 07/16/2020	Attended
	-	Edu - SACRS Public Pension Investment Management Program 2020 - Webinar	07/28/2020 - 08/13/2020	Attended
Gina Sanchez				
B	-	Edu - SACRS Sexual Harassment Prevention Training - Webinar	07/15/2020 - 07/15/2020	Attended

Category Legend:

A - Pre-Approved/Board Approved
B - Educational Conferences and Administrative Meetings in CA where total cost is no more than $2,000 or international prerequisite conferences per 705.00 A. 8.
C - Second of two conferences and/or meetings counted as one conference per Section 705.00.A.1 of the Travel Policy
X - Canceled events for which expenses have been incurred

LACERA

STAFF EDUCATION AND TRAVEL REPORT

AUGUST 2020

Attendee	Purpose of Travel - Location	Event Dates	Travel Status

No reportable travel incurred this period.

Documents not attached are exempt from disclosure under the California Public Records Act and other legal authority.

For further information, contact:
LACERA
Attention: Public Records Act Requests
300 N. Lake Ave., Suite 620
Pasadena, CA 91101

Documents not attached are exempt from disclosure under the California Public Records Act and other legal authority.

For further information, contact:
LACERA
Attention: Public Records Act Requests
300 N. Lake Ave., Suite 620
Pasadena, CA 91101

Documents not attached are exempt from disclosure under the California Public Records Act and other legal authority.

For further information, contact:
LACERA
Attention: Public Records Act Requests
300 N. Lake Ave., Suite 620
Pasadena, CA 91101

Documents not attached are exempt from disclosure under the California Public Records Act and other legal authority.

For further information, contact:
LACERA
Attention: Public Records Act Requests
300 N. Lake Ave., Suite 620
Pasadena, CA 91101

Documents not attached are exempt from disclosure under the California Public Records Act and other legal authority.

For further information, contact:
LACERA
Attention: Public Records Act Requests
300 N. Lake Ave., Suite 620
Pasadena, CA 91101

Documents not attached are exempt from disclosure under the California Public Records Act and other legal authority.

For further information, contact:
LACERA
Attention: Public Records Act Requests
300 N. Lake Ave., Suite 620
Pasadena, CA 91101

Documents not attached are exempt from disclosure under the California Public Records Act and other legal authority.

For further information, contact:
LACERA
Attention: Public Records Act Requests
300 N. Lake Ave., Suite 620
Pasadena, CA 91101