

Stanislaus County Employees' Retirement Association

832 12th Street, Ste. 600, Modesto, CA 95354 • PO Box 3150, Modesto, CA 95353 • www.stancera.org • 209-525-6393 • 209-558-4976 Fax

AGENDA

BOARD OF RETIREMENT 832 12th Street Ste. 600, **Wesley W. Hall Board Room** Modesto, CA 95354

March 28, 2017 1:30 p.m.

The Board of Retirement welcomes you to its meetings, which are regularly held on the third Wednesday of each month. Your interest is encouraged and appreciated.

CONSENT ITEMS: These matters include routine administrative actions and are identified under the Consent Items heading.

PUBLIC COMMENT: Matters under jurisdiction of the Board, may be addressed by the general public before or during the regular agenda. However, California law prohibits the Board from taking action on any matter which is not on the posted agenda unless it is determined an emergency by the Board of Retirement. Any member of the public wishing to address the Board during the "Public Comment," period shall be permitted to be heard once up to three minutes. Please complete a Public Comment Form and give it to the Chair of the Board. Any person wishing to make a presentation to the Board must submit the presentation in written form, with copies furnished to all Board members. Presentations are limited to three minutes.

BOARD AGENDAS & MINUTES: Board agendas, minutes and copies of items to be considered by the Board of Retirement are customarily posted on the Internet by Friday afternoon preceding a meeting at the following website: www.stancera.org.

Materials related to an item on this Agenda submitted to the Board after distribution of the agenda packet are available for public inspection at StanCERA, 832 12th Street, Suite 600, Modesto, CA 95354, during normal business hours.

AUDIO: All Board of Retirement regular meetings are audio recorded. Audio recordings of the meetings are available after the meetings at http://www.stancera.org/agenda.

NOTICE REGARDING NON-ENGLISH SPEAKERS: Board of Retirement meetings are conducted in English and translation to other languages is not provided. Please make arrangements for an interpreter if necessary.

REASONABLE ACCOMMODATIONS: In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Board Secretary at (209) 525-6393. Notification 72 hours prior to the meeting will enable StanCERA to make reasonable arrangements to ensure accessibility to this meeting.

- 1. Call Meeting to Order
- Roll Call
- 3. Announcements
- 4. Public Comment
- 5. Consent Items
 - a. Approval of the February 28, 2017 Meeting Minutes View
 - b. Monthly Staff Report View
 - c. Approval of Service Retirement(s) Sections 31499.14, 31670, 31662.2 & 31810
 - 1. Almen, Christine Alliance Worknet Effective 03-18-17
 - 2. Arredondo, Ralph Alliance Worknet Effective 03-31-17
 - 3. Baker, Lynne Assessor Effective 03-31-17
 - 4. Bean, Jeanine Courts Effective 03-31-17
 - 5. Bekedam, Beverley HSA Effective 03-27-17
 - 6. Bertalotto, Kevin -DA Effective 03-18-17 *
 - 7. Blomquist, Carol Library Effective 03-31-17
 - 8. Blumenstein, Joann CSA Effective 03-30-17
 - 9. Boulet, Jeanne Alliance Worknet- Effective 03-31-17
 - 10. Brewer, Sharon HSA Effective 03-18-17
 - 11. Burrows, Lynda CSA Effective 03-17-17
 - 12. Camboia, Phyllis CSA Effective 03-04-17
 - 13. Cambron, Roger CSA Effective 03-04-17
 - 14. Cardoza, Mark Sheriff Effective 03-18-17 *
 - 15. Concepcion, Cynthia CSA Effective 03-04-17
 - 16. Dean, Nenita CSA Effective 03-31-17
 - 17. Dunbar, Carol HSA Effective 03-18-17

5. Consent Items(Cont.)

- 18. Egbikuadje, John Alliance Worknet Effective 03-31-17
- 19. Fidalgo, Teresa CSA Effective 03-25-17
- 20. Frisk, Rose CSA Effective 03-04-17
- 21. Frost, David Sheriff Effective 03-13-17 *
- 22. Gatto, Frank DER Effective 03-29-17
- 23. Gisler, Karen DA Effective 03-31-17
- 24. Gobel, Gene HSA Effective 03-16-17
- 25. Gomez, Jose City of Ceres Effective 03-31-17
- 26. Hendricks, Richard Sheriff Effective 03-02-17 *
- 27. Hunt, Robert Sheriff Effective 03-18-17 *
- 28. Huntsinger, Peggy CEO Effective 3-18-17
- 29. Jeffries, Vaughn HSA Effective 03-03-17
- 30. Jimenez, Cheryl Sheriff Effective 03-18-17 *
- 31. Jonasen, Laura CSA Effective 03-31-17
- 32. Kelly, Alice CSA Effective 03-04-17
- 33. Loeser, Shawna Public Works Effective 03-02-17
- 34. Lopez, Elsa DCSS Effective 02-28-17
- 35. Mahaney, Richard CSA Effective 03-30-17
- 36. Martinez, Aaron BHRS Effective 03-31-17
- 37. Mitre, Maria CSA Effective 03-11-17
- 38. Morrison, Elizabeth CSA Effective 03-18-17
- 39. Muldrow, Karen Probation Effective 03-02-17 *
- 40. Negley, Denise Sheriff Effective 03-18-17 *
- 41. Pagcaliuagan, Leonard Sheriff Effective 03-18-17 *
- 42. Perez, Lucila HSA Effective 03-31-17
- 43. Perez, Vita Alliance Worknet Effective 03-31-17
- 44. Peterson, Dwight DCSS Effective 03-17-17
- 45. Powers, Jerry Probation Effective 01-05-16 *
- 46. Renard, Melanie Courts Effective 03-09-17
- 47. Sanchez, Juan BHRS Effective 03-31-17
- 48. Sciabica, Emily Alliance WorkNet Effective 03-31-17
- 49. Sharp, Sharon DA Effective 03-31-17
- 50. Sorlin, Asiyah CSA Effective 03-18-17
- 51. Sweatman, Vivian Sheriff Effective 03-18-17 *
- 52. Tigner, Debra Probation Effective 03-09-17
- 53. Valenzuela, Olga CSA Effective 03-31-17
- 54. Villalobos, Elvia CSA Effective 02-08-17
- 55. Walker, John HSA Effective 03-31-17
- 56. Weaver, James Sheriff Effective 03-16-17 *
- 57. Wheeler, Randall City of Ceres Effective 03-30-17 *

d. Approval of Deferred Retirement(s) - Section 31700

- 1. Casas, Martha HSA Effective 01-21-17
- 2. Gregory-Duarte, Laura HSA Effective 01-26-17
- 3. Grow, Tara Probation Effective 02-25-17 *
- 4. Martinez, Adrian Sheriff Effective 01-6-17 *
- 5. Ramirez, Ashely Probation Effective 2-27-17 *
- 6. Rogers, Lillian DA Effective 11-19-16

^{*} Indicates Safety Personnel

- e. Approval of Death Benefit **Sections 31781, 31781.1 and 31781.3**
 - 1. . Meredith, Diane, Deceased March 16, 2017, Active Member

6. Investment Manager Annual Presentation

- a. PIMCO
 - 1. Value Added View
- b. LSV
 - 1. Value Added View

7. Executive Director – Investment

- Discussion and Action Regarding Bank of New York Mellon Foreign Exchange Transaction Litigation <u>View</u>
- b. Auxiliary Investment Report View
- 8. Verus Investment Consultant
 - a. Flash Report February 29, 2017 View
 - b. Discussion and Action Regarding Asset Allocation and Risk Parity Review View
 - c. Value Add Private Investments View
- 9. <u>Executive Director Administrative</u>
 - a. Discussion and Action Regarding 2016 Final Actuarial Valuation Results View
 - b. Legal/Legislation Update
 - c. Information Technology Solutions (ITS) Project Update View

10. Closed Session

- a. Discussion and Action Regarding Jackson Square Partners Government Code Section 54956.81
- b. Conference with Legal Counsel Pending Litigation One Case:
 O'Neal et al v. Stanislaus County Employees' Retirement Association
 Stanislaus County Superior Court Case No. 648469
 Government Code Section 54956.9(d)(1)
- c. Conference with Legal Counsel Pending Litigation One Case: Stanislaus County Employees' Retirement Association v. Buck Consultants, LLC, Mediation Pursuant to Evidence Code Sections 1115, 1119, 1152 Government Code Section 54956.9(d)(4)
- 11. Members' Forum (Information and Future Agenda Requests Only)
 - a. SACRS Board of Directors Outreach Program Correspondence View
- 12. Adjournment

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BOARD OF RETIREMENT MINUTES February 28, 2017

Call Meeting to Order

Meeting called to order 1:30 p.m. by Trustee Gharat, Chair

2. Roll Call

Trustees Present: Mike Lynch, Darin Gharat Donna Riley Jim DeMartini, Jeff Grover,

Mandip Dhillon, Sam Sharpe and Jagen Raja for Gordon Ford

Trustees Absent: Michael O'Neal, Gordon Ford

Alternate Trustee Joan Clendenin, Alternate Retiree Representative

Staff Present: Rick Santos, Executive Director

Kellie Gomes, Executive Board Assistant Kathy Herman, Fiscal Services Manager

Dawn Lea, Member and Employer Services Manager

Others Present: Fred Silva, General Legal Counsel

Ed Hoffman, Investment Consultant

3. <u>Announcements</u>

Kathy Herman announced StanCERA will be working on tenant contract negotiations and will be final by August 2017.

4. Public Comment

None

5. Consent Items

- a. Approval of the January 24, 2017 Meeting Minutes
- b. Monthly Staff Report
- c. 2017 Cost of Living Adjustment
- d. Fiscal Year 2016-2017 Mid-Year Budget Review
- e. Bank of New York Mellon Foreign Exchange Transaction Litigation
- f . Approval of Service Retirement(s) Sections 31499.14, 31670, 31662.2 & 31810
 - 1. Aguiar, Dorothy BHRS Effective 02-02-17
 - 2. Brennan, Sheryl Ag Comm Effective 02-18-17
 - 3. Bridges, William GSA Effective 02-14-17
 - 4. Card, Susan CSA Effective 02-18-17
 - 5. Carpenter, Cheryl Ceres Effective 02-05-17
 - 6. Casas, Belinda CSA Effective 02-04-17
 - 7. Castro, Denise Auditor Effective 12-30-16
 - 8. Childers, Brook Probation Effective 02-18-17 *
 - 9. Dysert, Kimberlee CSA Effective 02-15-17
 - 10. Linn, Judith HSA- Effective 01-18-17

5. Consent Items(Cont.)

- 11. Martin, Debra CSA Effective 02-17-17
- 12. Mull, Cynthia CSA Effective 02-16-17
- 13. Perez, Anita BHRS Effective 02-07-17
- 14. Silva, Jill Probation Effective 02-18-17 *
- * Indicates Safety Personnel
- g. Approval of Deferred Retirement(s) Section 31700
 - 1. Arellano, Maria DCSS Effective 01-26-17
 - 2. Crabtree, Janis Stan Regional 911 Effective 01-11-17
 - 3. Mulhollen, Nadia Sheriff Effective 02-04-17
 - 4. Sanders, Theresa SBT Effective 01-10-17
 - 5. Vargas, Feliciana CSA Effective 11-12-16
- h. Approval of Death Benefit Sections 31781, 31781.1 and 31781.3
 - 1. Parmley, Linda, Deceased January 30, 2017, Active Member
- i. Approval of Disability Retirement Section 31724
 - 1. Drury, Lisa, Health Services Agency, Non-Service Connected, Effective 01-21-17

Item 5.e was pulled by Mike Lynch to discuss at our next meeting

Motion was made by Trustee Grover and seconded by Trustee Riley to accept the consent items as presented except for item 5.e.pulled for discussion next meeting.

Motion carried unanimously

Executive Director – Administrative

a. Discussion and Action Regarding Bartel Associates Actuarial Review of June 30, 2015 Actuarial Valuation and July 1, 2012 through June 30, 2015 Experience Study

Motion was made by Trustee Dhillon and seconded by Trustee Grover to accept the consent items as presented

Motion carried unanimously

b. Discussion and Action Regarding 2016 Preliminary Actuarial Valuation Results

Motion was made by Trustee Dhillon and seconded by Trustee Clendenin to accept the consent items as presented

Motion carried unanimously

c. Legal/Legislation Update

Nothing to Report

d. Information Technology Solutions (ITS) Project Update

Dawn gave an update on the progress with the Pension Administration System.

7. Investment Manager Annual Presentation

a. LEGATO

1. Value Added

Presentations were heard by conference call

- b. Jackson Square Partners
 - 1. Value Added

Presentations were heard by conference call

Closed Session Item 10.b heard out of order

Motion was made by Trustee Riley and seconded by Trustee Raja to enter in to closed session to hear item 10.b.

Motion carried unanimously

Trustee Clendenin recused herself for closed session 10.b. Trustee Clendenin returned to the meeting at open session.

Nothing to report from closed session

8. Executive Director - Investment

a. Discussion and Action Regarding StanCERA Schedule of Directives; Directives #2 and #3

Motion was made by Trustee Grover and seconded by Trustee Raja to adopt Directives 2 & 3 as presented.

Motion carried unanimously

9. Verus - Investment Consultant

- a. Flash Report January 30, 2017
- b. Investment Performance 2016 Quarter 4 Review
- c. Discussion and Action Regarding Search for Risk Parity Mandate

Motion was made by Trustee Riley and seconded by Trustee Dhillon to direct staff and Verus to conduct on-site due diligence with the selected investment managers, determine portfolio structure and present a final recommendation to the Board at the April meeting.

Motion carried unanimously

10. Closed Session

Motion was made by Trustee Riley and seconded by Trustee Lynch to move in to closed session at 4:48 pm

Motion carried unanimously

10. Closed Session (cont.)

- a. Recommendation for Non-Service Connected Disability Retirement for Jeannette Apolinar Section 31533
- b. Conference with Legal Counsel Pending Litigation One Case:
 O'Neal et al v. Stanislaus County Employees' Retirement Association
 Stanislaus County Superior Court Case No. 648469
 Government Code Section 54956.9(d)(1)
- c . Conference with Legal Counsel Pending Litigation One Case: Stanislaus County Employees' Retirement Association v. Buck Consultants, LLC, Mediation Pursuant to Evidence Code Sections 1115, 1119, 1152 Government Code Section 54956.9(d)(4)

Motion was made by Trustee Grover and seconded by Trustee Riley to move in to open session at 4:56 pm

Motion carried unanimously

Kellie Gomes Read out Motion for Item 10.a as follows:

Motion was made by Trustee Clendenin and seconded by Trustee DeMartini to acknowledge and approve the findings and recommendation of Hearing Officer Michael Loeffler regarding the matter of Jeanette Apolinar on her application for non-service connected disability; and to deny the applicant Jeanette Apolinar on her application for non-service connected disability.

Motion carried unanimously

11. Members' Forum (Information and Future Agenda Requests Only)

Trustee Clendenin requested that in the future if meetings are going to be lengthy we should hold a special meeting. A hold two separate meetings.

Trustee Gharat asked for suggestions on how we can still maintain one meeting a month but structure the agenda differently.

12. Adjournment

Meeting adjourned at 4:59 p.m.

Respectfully submitted,

Rick Santos, Executive Director

APPROVED AS TO FORM:

By:

Fred Silva, GENERAL LEGAL COUNSEL

Fred Silva, General Legal Counsel



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March 28, 2017

Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

I. SUBJECT: Monthly Staff Report

II. ITEM NUMBER: 5.b

III. ITEM TYPE: Information Only

IV. STAFF RECOMMENDATION: None

V. ANALYSIS:

a) Member & Employer Services – During the month of February 2017, Member and Employer Services Staff processed 26 new hires (7 Safety and 19 General), 33 terminations, 1 estimate and 4 buy backs. There were 29 individual counseling sessions and one group session at New Employee Orientation.

Staff dedicated many hours to meeting with the Tegrit Analysts to begin defining the business rules necessary to ensure that StanCERA's needs will be met with the Arrivos system.

The entire staff participated in preparing the member files for scanning. Manifests were prepared for each drawer of every file cabinet to document the contents within.

Staff continues to audit member files in anticipation of the data conversion that will be required with the implementation of the Arrivos pension administration system.

- b) Fiscal Services Staff is working through the contract process for Insight, DFA and Northern Trust in preparation of the rebalance scheduled later this year. Staff also spent the month maintaining regular functions and preparing for the back file conversion of 8,000 plus member files, set to begin the 1st week of April.
- c) Investment Governance and Compliance Staff continues to progress through the interview process for the Investment Officer position. The first screening of interviews has taken place and the remaining candidate pool is quite promising. The pool contains a broad spectrum of people with related investment experience, ranging from intensive analytic skills to candidates that possess significant experience in the alternative space (private equity and private credit). In addition, the remaining pool contains candidates from around the entire country.

Retirement Board – March 28, 2017 Monthly Staff Report Page 2

VI. RISK: None

VII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently*

VIII. ADMINISTRATIVE BUDGET IMPACT: NONE

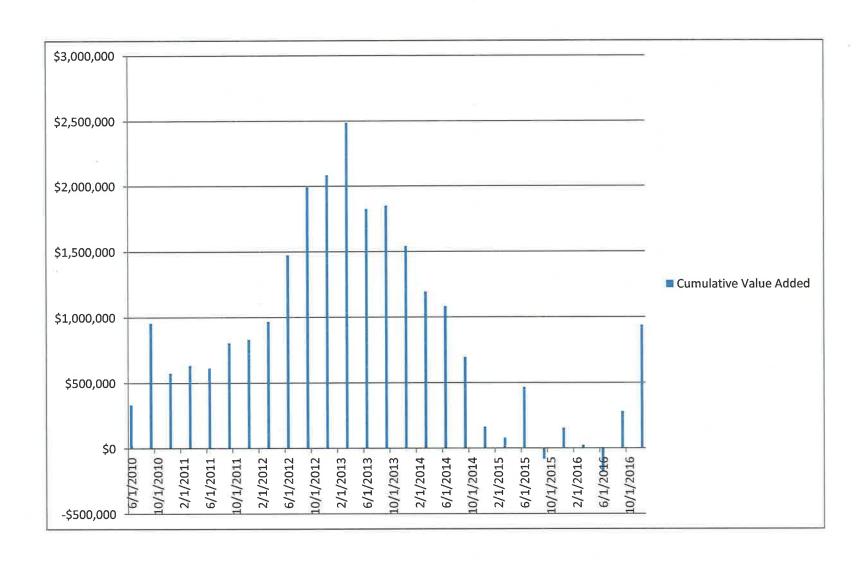
Rick Santos, Executive Director

Kathy Herman, Fiscal Services Manager

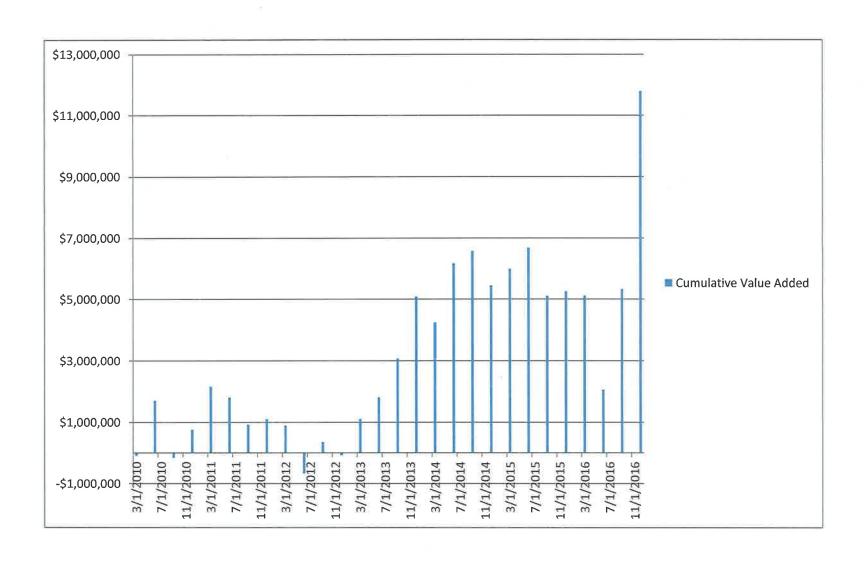
Dawn Lea, Member and Employer Services Manager

PIMCO

Cumulative Value Added 4/1/2010 thru 3/31/2017



LSV
Cumulative Value Added
1/1/2010 thru 12/31/2016





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March 28, 2017

Retirement Board Agenda Item

TO:

Retirement Board

FROM:

Natalie Elliott, Retirement Accountant

I. SUBJECT: Bank of New York Mellon Foreign Exchange Transaction Litigation

II. ITEM NUMBER: 7.a.

III. ITEM TYPE: Information/Discussion

IV. STAFF RECOMMENDATION: None

V. ANALYSIS: During the January 24, 2017 Board of Retirement meeting, a presentation was made by Insight, a prospective liquidity manager for StanCERA, who is owned by Bank of New York Mellon (BNYM). There was inquiry as to the relationship between Insight and BNYM and staff was directed to research two questions posed.

Question #1 – Where in the process is the litigation regarding BNYM and their foreign exchange transaction practices?

In 2011, a lawsuit was filed by the New York Attorney General after a whistleblower complaint was filed and researched. The complaint alleged that BNYM earned \$2 billion over ten years through deception. In March 2015, BNYM admitted to a "statement of facts" that alleged the bank misrepresented the pricing and execution of Standing Instruction foreign currency transactions made on behalf of their clients. The admission was part of a \$714 million settlement with U.S. Government, State of New York, Securities and Exchange Commission (SEC), Department of Labor, and class action litigation. The bank agreed to provide detailed information about inter-bank exchange rates and the actually-settled buy-sell rates for its clients as part of the settlement. The bank also agreed to avoid using the misleading phrases "best execution", "free", or "netting" in any communication about its standing instruction foreign exchange services. BNYM also fired the Head of Product Management as well as other executives responsible for the misrepresentations. In May 2016, BNYM agreed to pay \$180 million to resolve a putative class action lawsuit brought by the State of Oregon and others alleging BNYM misled investors by making deceptive public statements about its foreign exchange program in violation of securities laws. The SEC found the bank misled certain custody clients on foreign currency transactions from 2000 to at least 2011 and in June 2016 the bank was to pay a \$30 million penalty. To date, BNYM has paid out over \$1.5 billion representing revenue gained from the misconduct, penalties and settlements to States, U.S. Government, SEC, Department of Labor, various pension funds, and private clients. StanCERA was one of the recipients and in June 2016 received \$21,901.45 from a class action suit filed by Putnam All-Country World (Ex US) Equity Fund, LLC. Most of the major lawsuits have been settled.

This settlement is just part of an effort to clean up the foreign exchange market. In November 2014 European and U.S. regulators fined six global banks a total of \$4.3 billion for conspiring to manipulate foreign exchange rates to boost profits.

Question #2 – What rules or regulations have been put into place to help mitigate the risk of the custodial bank misrepresenting their fees for foreign exchange transactions?

Two regulations and one rule were violated by BNYM exercising their standing instruction foreign exchange transaction practices.

- 1 Investment Company Act of 1940, Section 34(b) which prohibits any person from making any untrue statement of a material fact in any registration statement, application, report, account, record, or other document filed or transmitted pursuant to Section 31(a), and provides that it shall be unlawful for any person so filing, transmitting, or keeping any such document to omit to state therein any fact necessary in order to prevent the statements made therein, in the light of the circumstances under which they were made, from being materially misleading.
- 2 Investment Company Act of 1940, Section 31(a) which requires each registered investment company, and each underwriter, broker, dealer, or investment adviser that is a majority owned subsidiary of such a company to maintain and preserve such records for such period or periods as the Commission, by rules and regulations, may prescribe as necessary or appropriate in the public interest or for the protection of investors.
- 3 Council on Foreign Relations Rule, Title 17, Section 270, Sub Section 31a-1 which requires registered investment companies to maintain accounts, books, and other documents relating to its business forming the basis for financial statements required to be filed which shall contain certain information about their transactions.

The rules and regulations have not been amended, however, in light of these violations, BNYM is required to report to the SEC once a year for three years the status of its remediation and implementation of compliance measures relating to any of the Standing Instruction FX trading programs including procedures of internal audits to ensure the effectiveness of such remedial efforts and compliance measures. BNYM is also required to report within thirty days any potential misconduct or allegations of misconduct involving the programs that BNYM discovers. During this three year review, BNYM is required to provide its external auditors with the results of the internal audits of its remedial efforts and compliance measures. And, BNYM is required to provide to the SEC any written reports, responses or recommendations provided to BNYM by their external auditors regarding the results of the internal audits.

VI. RISK: None

VII. STRATEGIC PLAN: Strategic Objective II: Develop efficient and effective processes for the evaluation, monitoring and disposition of StanCERA's active managers.

VIII. ADMINISTRATIVE BUDGET IMPACT: NONE

Natalie Elliott, Retirement Accountant

Rick Santos, Executive Director



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March 28, 2017

Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

I. SUBJECT: Auxiliary Investment Report

II. ITEM NUMBER: 7.b

III. ITEM TYPE: Information Only

IV. STAFF RECOMMENDATION: None

V. ANALYSIS:

Value Added Analysis - Equity and Fixed Income

• Quarter ending 12/31/2016 (pages 1, 2)

During the quarter ending 12/31/2016, the portfolio added \$11 million in value relative to the passive investment after fees. This performance was led mainly by the fixed income asset class adding \$8.2 million in value. Dodge and Cox Fixed Income accounted for about \$7.5 million.

International equity performed well, earning approximately \$5 million after fees, all of it coming from LSV earning \$6.5 million.

Domestic equity was driven solely by Dodge & Cox, earning \$6 million, while Jackson Square lost approximately \$6.5 million to the passive investment.

• Calendar year ending 12/31/2016 (pages 3, 4)

For the calendar year ending 2016, the portfolio gave up \$2.8 million to the passive investment after fees. Performance was driven largely by domestic equity, giving up \$18.3 million. International Equity and Fixed Income did well for 2016, earning \$3.0 and \$12.3 million, respectively.

Dodge & Cox Fixed Income and Jackson Square were by far the largest contributors to total value added, as D&C Fixed earned \$11.4 million and JS gave up \$17.2 million to the passive investment.

Investment Fee Summary – All Investments - Period Ending 9/30/2016 (pages 5 – 7)

This report breaks out all fees paid to all StanCERA managers for the past 27 months. It also breaks out fees by asset class, discretion and style. Overall, StanCERA has paid approximately \$20.1 million in fees to manage its portfolio over this time period. This translates to an annualized fee of 49 basis points.

Retirement Board – March 28, 2017 Auxiliary Investment Report Page 2

In general, the alternative asset class accounts for one third of all fees StanCERA pays to its managers. Those funds that charge fees on uncommitted capital contribute greatly to the annualized basis point computation, since charges are being calculated only on capital actually committed.

Cash Flow Report (page 8)

This report is self-explanatory

VI. RISK: None

VII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently.

VIII. ADMINISTRATIVE BUDGET IMPACT: None

Rick Santos, Executive Director

Kathy Herman, Fiscal Services Manager



StanCERA Value Added Analysis - Equities

10/1/2016

thru

12/31/2016

Active Domestic Equity

				Portfolio Averages			Dollar Returns			
Mngr ID	Manager	Benchmark Index	Assets Managed	Uninvested Assets	Invested Assets	Manager	Benchmark	Excess	Fees	Value Added
1	Dodge Cox Equity	Russell 1000 Value	\$184,358,135	\$5,170,176	\$179,187,960	\$18,739,167	\$12,572,904	\$6,166,263	\$99,026	\$6,067,237
7	Jackson Square	Russell 1000 Growth	\$126,382,624	\$1,317,175	\$125,065,449	-\$5,121,756	\$1,260,698	-\$6,382,454	\$163,772	-\$6,546,226
19	AMI	Russell 2000 Growth	\$20,177,504	\$427,498	\$19,750,005	\$1,779,763	\$851,750	\$928,013	\$43,748	\$884,264
20	CastleArk	Russell 2000 Growth	\$19,302,917	\$228,580	\$19,074,337	\$359,437	\$787,893	-\$428,456	\$50,821	-\$479,278
21	Lee Munder	Russell 2000 Growth	\$19,186,620	\$551,912	\$18,634,709	\$571,193	\$780,659	-\$209,466	\$52,249	-\$261,715
22	Rice Hall	Russell 2000 Growth	\$25,248,268	\$351,989	\$24,896,279	\$1,262,261	\$1,026,461	\$235,800	\$53,715	\$182,085
25	Channing	Russell 2000 Value	\$21,367,866	\$445,896	\$20,921,970	\$3,205,686	\$3,071,768	\$133,918	\$44,965	\$88,953
26	Inview	Russell 2000 Value	\$20,648,159	\$900,444	\$19,747,715	\$2,270,699	\$2,913,531	-\$642,832	\$41,488	-\$684,320
27	Keelev	Russell 2000 Value	\$11,892,839	\$329,975	\$11,562,865	\$1,120,692	\$1,699,267	-\$578,575	\$26,050	-\$604,625
28	Pacific Ridge	Russell Micro Cap Value Index	\$15,703,984	\$403,900	\$15,300,083	\$2,643,296	\$2,532,468	\$110,828	\$40,629	\$70,199
29	Walthausen	Russell 2000 Value	\$12,504,943	\$696,368	\$11,808,574	\$2,106,247	\$1,792,409	\$313,839	\$28,671	\$285,168
4	Bernzott	Russell 2000 Value	\$12,140,960	\$616,348	\$11,524,612	\$561,982	\$1,712,683	-\$1,150,701	\$26,233	-\$1,176,934
Total Activ	e Domestic Equity		\$488,914,820	\$11,440,262	\$477,474,558	\$29,498,667	\$31,002,492	-\$1,503,825	\$671,366	-\$2,175,192
		Passive Domestic Equity								
				Portfolio Averages			Dollar Returns			
Mngr ID	Manager	Benchmark Index	Assets Managed	Uninvested Assets	Invested Assets	Manager	Benchmark	Excess	Fees	Value Added
11	Blackrock Value	Russell 1000 Value	\$107,562,381	-\$137	\$107,562,518	\$7,181,818	\$7,235,442	-\$53,624	\$7,063	-\$60,687
12	Blackrock Growth	Russell 1000 Growth	\$88,813,362	-\$137	\$88,813,499	\$979,446	\$954,408	\$25,038	\$6,063	\$18,975
14	BNYM S&P	S&P 500	\$90,606,581	\$0	\$90,606,581	\$3,530,855	\$3,525,549	\$5,306	\$9,911	-\$4,605
~ .	5.444.50.1	34. 333	****	**						
Total Passi	ive Domestic Equity		\$286,982,323	-\$274	\$286,982,598	\$11,692,120	\$11,715,399	-\$23,279	\$23,037	-\$46,316
				Intern	ational Equity					
				Portfolio Averages			Dollar Returns			
Mngr 1D	Manager	Benchmark Index	Assets Managed	Uninvested Assets	Invested Assets	Manager	Benchmark	Excess	Fees	Value Added
8	LSV	MSCI ACWI ex USA Gross	\$181,038,545	\$1,839,742	\$179,198,803	\$4,444,602	-\$2,222,882	\$6,667,484	\$179,958	\$6,487,526
10	Fidelity	MSCI ACWI ex USA Gross	\$179,547,971	\$1,734,531	\$177,813,440	-\$3,537,989	-\$2,293,128	-\$1,244,861	\$180,205	-\$1,425,066
10	ridenty	MISCI ACMI EX USA GIUSS	\$175,547,571	\$1,734,331	\$177,013,440	-55,557,565	-72,233,120	-91,244,001	7100,203	-91,423,000
Total Inter	national Equity		\$360,586,516	\$3,574,273	\$357,012,243	\$906,613	-\$4,516,010	\$5,422,624	\$360,163	\$5,062,461
			, , , ,	. , , , -	, , , , , , , , , , , , , , , , , , , ,		,			
Total Stan	CERA Value Added - E	quities	\$1,136,483,659	\$15,014,260	\$1,121,469,399	\$42,097,400	\$38,201,881	\$3,895,519	\$1,054,566	\$2,840,953



StanCERA Value Added Analysis - Fixed Income

10/1/2016

thru

12/31/2016

Domestic Fixed Income

				Portfolio Averages		I	Dollar Returns			
Mngr ID 2 9	Manager PIMCO Dodge Cox Fixed Income	Benchmark Index Bloomberg Barclays US Aggregate Bloomberg Barclays US Aggregate	<u>Assets Managed</u> \$115,619,647 \$406,173,298	<u>Uninvested Assets</u> \$663,076 \$10,592,188	\$114,956,571 \$395,581,110	<u>Manager</u> -\$2,682,431 -\$4,686,494	Benchmark -\$3,492,041 -\$12,326,429	Excess \$809,610 \$7,639,935	Fees \$103,250 \$125,847	Value Added \$706,361 \$7,514,088
Total Stan	CERA Value Added - Fi	xed Income	\$521,792,945	\$11,255,265	\$510,537,681	-\$7,368,925	-\$15,818,470	\$8,449,545	\$229,097	\$8,220,448

StanCERA Value Added Analysis - Total Equities and Fixed Income

10/1/2016

thru

12/31/2016

		Portfolio Averages			Dollar Returns			
	Assets Managed	Uninvested Assets	Invested Assets	<u>Manager</u>	<u>Benchmark</u>	Excess	Fees	Value Added
Total StanCERA Value Added - Equities and Fixed Income	\$1,658,276,604	\$26,269,525	\$1,632,007,079	\$34,728,475	\$22,383,410	\$12,345,064	\$1,283,663	\$11,061,401



StanCERA Value Added Analysis - Equities

1/1/2016

thru

12/31/2016

Active Domestic Equity

				Portfolio Averages			Dollar Returns			
Mngr ID	Manager	Benchmark Index	Assets Managed	Uninvested Assets	Invested Assets	Manager	Benchmark	Excess	Fees	Value Added
1	Dodge Cox Equity	Russell 1000 Value	\$173,748,237	\$5,283,934	\$168,464,303	\$35,822,916	\$29,312,401	\$6,510,515	\$349,039	\$6,161,477
7	Jackson Square	Russell 1000 Growth	\$136,286,396	\$1,997,935	\$134,288,461	-\$7,538,088	\$8,987,246	-\$16,525,334	\$664,038	-\$17,189,372
19	AMI	Russell 2000 Growth	\$19,136,805	\$411,378	\$18,725,427	\$2,515,127	\$2,435,700	\$79,427	\$153,457	-\$74,031
20	CastleArk	Russell 2000 Growth	\$15,799,229	\$186,298	\$15,612,932	\$1,232,421	\$2,010,050	-\$777,629	\$140,772	-\$918,401
21	Lee Munder	Russell 2000 Growth	\$16,541,780	\$463,391	\$16,078,389	-\$223,127	\$1,963,956	-\$2,187,084	\$148,616	-\$2,335,700
22	Rice Hall	Russell 2000 Growth	\$21,834,892	\$306,307	\$21,528,585	\$2,929,461	\$2,815,925	\$113,536	\$175,990	-\$62,455
25	Channing	Russell 2000 Value	\$19,347,301	\$419,451	\$18,927,850	\$5,553,468	\$5,924,986	-\$371,518	\$148,851	-\$520,369
26	Inview	Russell 2000 Value	\$19,125,853	\$927,066	\$18,198,786	\$4,661,962	\$5,766,749	-\$1,104,787	\$142,656	-\$1,247,442
27	Keeley	Russell 2000 Value	\$10,964,892	\$352,499	\$10,612,393	\$2,214,800	\$3,317,538	-\$1,102,738	\$85,603	-\$1,188,341
28	Pacific Ridge	Russell Micro Cap Value Index	\$13,665,725	\$285,488	\$13,380,237	\$4,987,013	\$4,071,294	\$915,719	\$127,699	\$788,020
29	Walthausen	Russell 2000 Value	\$11,277,093	\$533,163	\$10,743,930	\$3,514,547	\$3,457,171	\$57,376	\$89,900	-\$32,525
4	Bernzott	Russell 2000 Value	\$11,419,829	\$610,252	\$10,809,576	\$1,884,652	\$3,428,167	-\$1,543,515	\$88,848	-\$1,632,364
Total Activ	e Domestic Equity		\$469,148,033	\$11,777,162	\$457,370,870	\$57,555,152	\$73,491,184	-\$15,936,032	\$2,315,470	-\$18,251,503
				Passive I	Domestic Equity					
				Portfolio Averages			Dollar Returns			
Mngr ID	Manager	Benchmark Index	Assets Managed	Uninvested Assets	Invested Assets	Manager	Benchmark	Excess	Fees	Value Added
11	Blackrock Value	Russell 1000 Value	\$108,489,737	-\$42	\$108,489,779	\$17,922,212	\$17,982,309	-\$60,097	\$23,695	-\$83,791
12	Blackrock Growth	Russell 1000 Growth	\$94,563,052	-\$42	\$94,563,095	\$6,727,477	\$6,621,983	\$105,494	\$20,768	\$84,727
14	BNYM S&P	S&P 500	\$83,605,931	\$0	\$83,605,931	\$10,240,059	\$10,220,221	\$19,838	\$32,208	-\$12,370
	Dittin Oct.	54. 500	+,	**	,,,	+==,===,	,,,	7-0,000	+ ,	+==, 0.0
Total Passi	ive Domestic Equity		\$286,658,721	-\$84	\$286,658,805	\$34,889,748	\$34,824,512	\$65,236	\$76,671	-\$11,434
				Interna	ational Equity					
				Portfolio Averages			Dollar Returns			
Mngr ID	Manager	Benchmark Index	Assets Managed	Uninvested Assets	Invested Assets	Manager	Benchmark	Excess	Fees	Value Added
8	LSV	MSCI ACWI ex USA Gross	\$168,483,802	\$1,215,355	\$167,268,447	\$16,505,574	\$8,897,030	\$7,608,544	\$513,305	\$7,095,239
10	Fidelity	MSCI ACWI ex USA Gross	\$171,636,245	\$1,962,701	\$169,673,544	\$5,610,543	\$8,988,684	-\$3,378,141	\$668,864	-\$4,047,006
	,							. , ,		, , , , , , , , , , , , , , , , , , , ,
Total Inter	national Equity		\$340,120,048	\$3,178,057	\$336,941,991	\$22,116,117	\$17,885,715	\$4,230,403	\$1,182,169	\$3,048,234
Total StanCERA Value Added - Equities			\$1,095,926,801	\$14,955,135	\$1,080,971,666	\$114,561,017	\$126,201,411	-\$11,640,394	\$3,574,310	-\$15,214,704



StanCERA Value Added Analysis - Fixed Income

1/1/2016

thru

12/31/2016

Domestic Fixed Income

				Portfolio Averages		I	Dollar Returns			
Mngr ID	Manager	Benchmark Index	Assets Managed	Uninvested Assets	Invested Assets	Manager	<u>Benchmark</u>	Excess	Fees	Value Added
2	PIMCO	Bloomberg Barclays US Aggregate	\$114,719,893	\$550,248	\$114,169,645	\$4,151,533	\$2,864,840	\$1,286,694	\$393,393	\$893,301
9	Dodge Cox Fixed Income	Bloomberg Barclays US Aggregate	\$395,734,674	\$11,908,494	\$383,826,179	\$20,978,985	\$9,077,696	\$11,901,289	\$453,182	\$11,448,107
										3.
Total Stand	CERA Value Added - Fi	xed Income	\$510,454,566	\$12,458,743	\$497,995,824	\$25,130,518	\$11,942,536	\$13,187,982	\$846,574	\$12,341,408

StanCERA Value Added Analysis - Total Equities and Fixed Income

1/1/2016

thru

12/31/2016

		Portfolio Averages			Dollar Returns			
	Assets Managed	Uninvested Assets	Invested Assets	<u>Manager</u>	<u>Benchmark</u>	Excess	Fees	Value Added
Total StanCERA Value Added - Equities and Fixed Income	\$1,606,381,367	\$27,413,877	\$1,578,967,490	\$139,691,535	\$138,143,947	\$1,547,589	\$4,420,884	-\$2,873,296

StanCERA Investment Fee Summary - Total Portfolio Level

STANCERA

7/1/2014

thru

9/30/2016

Salar Salar			Fee	es In Dollars			Α	nnualized Fees	in Basis	Points	
	Average AUM	<u>Managerial</u>	Performance	<u>Other</u>	Custodial	<u>Total</u>	Managerial	<u>Performance</u>	<u>Other</u>	<u>Custodial</u>	Total
Total StanCERA Portfolio	\$1,885,829,977	\$15,370,801	\$3,029,595	\$1,579,538	\$795,488	\$20,775,422	36.2	7.1	3.7	1.9	49.0
					Fees By As	sset Class					
	Average AUM	<u>Managerial</u>	<u>Performance</u>	<u>Other</u>	Custodial	<u>Total</u>	Managerial	<u>Performance</u>	<u>Other</u>	Custodial	<u>Total</u>
Domestic Equity	\$816,203,886	\$5,625,009	\$0	\$0	\$331,146	\$5,956,155	30.6	0.0	0.0	1.8	32.4
Domestic Fixed Income	\$497,690,518	\$1,781,245	\$0	\$0	\$73,992	\$1,855,237	15.9	0.0	0.0	0.7	16.6
International Equity	\$328,207,300	\$1,994,733	\$771,625	\$0	\$350,214	\$3,116,572	27.0	10.4	0.0	4.7	42.2
Alternatives	\$97,531,814	\$3,621,281	\$2,015,880	\$1,320,370	\$19,199	\$6,976,730	165.0	91.8	60.2	0.9	317.9
Real Assets	\$146,196,459	\$2,348,532	\$242,090	\$259,168	\$20,938	\$2,870,728	71.4	7.4	7.9	0.6	87.3
				Fees	By Investn	nent Discretion	1				
	Average AUM	<u>Managerial</u>	Performance	<u>Other</u>	Custodial	<u>Total</u>	Managerial	Performance	Other	Custodial	Total
Active	\$1,473,019,662	\$15,171,367	\$3,029,595	\$1,579,538	\$773,730	\$20,554,230	45.8	9.1	4.8	2.3	62.0
Passive	\$412,810,315	\$199,434	\$0	\$0	\$21,758	\$221,192	2.1	0.0	0.0	0.2	2.4
					nas Bu Inva	stmont Chilo					
	Augus as ALINA	Managarial	Doutovoonoo		•	stment Style	Managarial	Dorformono	Othon	Custodial	Takal
Larga Can Valua	Average AUM	Managerial	Performance \$0	Other \$0	Custodial \$35,694	Total	Managerial 12.3	Performance 0.0	Other 0.0	Custodial	Total
Large Cap Value	\$295,781,545	\$816,396	•			\$852,090				0.5	12.8
Small Cap Value	\$89,282,997	\$1,496,451	\$0 \$0	\$0 \$0	\$98,896	\$1,595,347	74.5	0.0	0.0	4.9	79.4
Large Cap Growth	\$258,779,421	\$1,726,727	\$0 \$0	\$0 \$0	\$39,000	\$1,765,727	29.6	0.0	0.0	0.7	30.3
Small Cap Growth	\$84,511,123	\$1,516,318	\$0 \$0		\$151,919	\$1,668,237	79.7	0.0	0.0	8.0	87.7
Core Fixed Income	\$497,690,518	\$1,781,245	\$0	\$0 \$0	\$73,992	\$1,855,237	15.9	0.0	0.0	0.7	16.6
Value Added Real Estate	\$34,159,833	\$836,921	\$242,090	\$0 \$0	\$12,023	\$1,091,034	108.9	31.5	0.0	1.6	141.9
Core Real Estate	\$104,099,266	\$30,903	\$0	\$0	\$5,427	\$36,331	1.3	0.0	0.0	0.2	1.6
Private Credit	\$97,531,814	\$3,621,281		\$1,320,370	\$19,199	\$6,976,730	165.0	91.8	60.2	0.9	317.9
Infrastructure	\$7,937,360	\$1,480,708	\$0	\$259,168	\$3,487	\$1,743,363	828.9	0.0	145.1	2.0	976.0
Core International	\$328,207,300	\$1,994,733	\$771,625	\$0	\$350,214	\$3,116,572	27.0	10.4	0.0	4.7	42.2
Core Equity	\$87,848,800	\$69,117	\$0	\$0	\$5,636	\$74,753	3.5	0.0	0.0	0.3	3.8



Investment Fees By Type

7/1/2014 thru

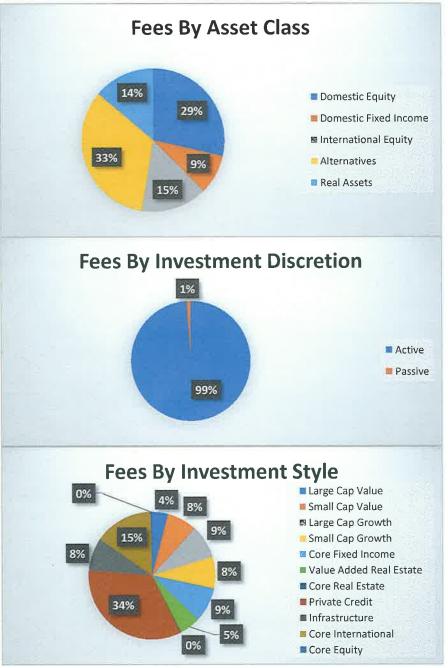
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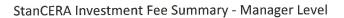
9/30/2016

Asset Class	<u>Fees</u>
Domestic Equity	\$5,956,155
Domestic Fixed Income	\$1,855,237
International Equity	\$3,116,572
Alternatives	\$6,976,730
Real Assets	<u>\$2,870,728</u>
Total	\$20,775,422

Investment Discretion	<u>Fees</u>
Active	\$20,554,230
Passive	<u>\$221,192</u>
Total	\$20,775,422

Investment Style	<u>Fees</u>
Large Cap Value	\$852,090
Small Cap Value	\$1,595,347
Large Cap Growth	\$1,765,727
Small Cap Growth	\$1,668,237
Core Fixed Income	\$1,855,237
Value Added Real Estate	\$1,091,034
Core Real Estate	\$36,331
Private Credit	\$6,976,730
Infrastructure	\$1,743,363
Core International	\$3,116,572
Core Equity	\$74,753
Total	\$20,775,422





STANCERA

7/1/2014 thru 9/30/2016

	Fees in Dollars						Fees in Annualized Basis Points					
Mngr_ID	Manager Name	Average AUM	Management	<u>Performance</u>	<u>Other</u>	Custodial	Total	<u>Management</u>	<u>Performance</u>	<u>Other</u>	<u>Custodial</u>	<u>Total</u>
1	Dodge Cox Equity	\$179,018,563	\$763,883	\$0	\$0	\$30,338	\$794,221	19.0	0.0	0.0	8.0	19.7
2	PIMCO	\$111,960,389	\$842,696	\$0	\$0	\$24,778	\$867,474	33.4	0.0	0.0	1.0	34.4
4	Bernzott	\$12,127,698	\$200,800	\$0	\$0	\$13,636	\$214,437	73.6	0.0	0.0	5.0	78.6
5	Eudaimonia	\$11,521,086	\$207,171	\$0	\$0	\$48,511	\$255,682	79.9	0.0	0.0	18.7	98.6
7	Jackson Square	\$154,680,155	\$1,679,827	\$0	\$0	\$33,661	\$1,713,488	48.3	0.0	0.0	1.0	49.2
8	LSV	\$162,270,084	\$895,424	\$153,385	\$0	\$195,156	\$1,243,965	24.5	4.2	0.0	5.3	34.1
9	Dodge Cox Fixed Income	\$385,730,128	\$938,549	\$0	\$0	\$49,214	\$987,763	10.8	0.0	0.0	0.6	11.4
10	Fidelity	\$165,937,216	\$1,099,309	\$618,240	\$0	\$155,058	\$1,872,608	29.4	16.6	0.0	4.2	50.1
11	Blackrock Value	\$116,762,982	\$52,513	\$0	\$0	\$5,356	\$57,869	2.0	0.0	0.0	0.2	2.2
12	Blackrock Growth	\$104,099,266	\$46,900	\$0	\$0	\$5,339	\$52,239	2.0	0.0	0.0	0.2	2.2
13	Raven Opportunity I	\$26,463,212	\$1,052,047	\$0	\$457,891	\$5,279	\$1,515,217	176.6	0.0	76.9	0.9	254.4
14	BNYM S&P	\$87,848,800	\$69,117	\$0	\$0	\$5,636	\$74,753	3.5	0.0	0.0	0.3	3.8
15	White Oak Pinnacle	\$34,253,018	\$823,089	\$2,015,793	\$287,350	\$5,393	\$3,131,625	106.8	261.5	37.3	0.7	406.2
16	Medley Opportunity Fund	\$30,351,149	\$645,200	\$87	\$312,281	\$5,285	\$962,853	94.5	0.0	45.7	0.8	141.0
17	Blackrock US Real Estate	\$104,099,266	\$30,903	\$0	\$0	\$5,427	\$36,331	1.3	0.0	0.0	0.2	1.6
18	Greenfield GAP	\$9,193,420	\$504,537	\$0	\$0	\$4,988	\$509,525	243.9	0.0	0.0	2.4	246.3
19	AMI	\$19,140,725	\$343,586	\$0	\$0	\$13,531	\$357,117	79.8	0.0	0.0	3.1	82.9
20	CastleArk	\$15,287,435	\$274,570	\$0	\$0	\$41,485	\$316,054	79.8	0.0	0.0	12.1	91.9
21	Lee Munder	\$17,912,510	\$322,555	\$0	\$0	\$33,953	\$356,509	80.0	0.0	0.0	8.4	88.4
22	Rice Hall	\$20,649,367	\$368,436	\$0	\$0	\$14,439	\$382,875	79.3	0.0	0.0	3.1	82.4
25	Channing	\$20,214,599	\$333,570	\$0	\$0	\$17,679	\$351,249	73.3	0.0	0.0	3.9	77.2
26	Inview	\$20,214,599	\$322,658	\$0	\$0	\$14,165	\$336,822	70.9	0.0	0.0	3.1	74.0
27	Keeley	\$11,419,518	\$187,857	\$0	\$0	\$13,809	\$201,667	73.1	0.0	0.0	5.4	78.5
28	Pacific Ridge	\$13,438,208	\$256,412	\$0	\$0	\$19,851	\$276,263	84.8	0.0	0.0	6.6	91.3
29	Walthausen	\$11,868,375	\$195,153	\$0	\$0	\$19,756	\$214,910	73.1	0.0	0.0	7.4	80.5
30	Prime Property Fund	\$15,960,298	\$130,929	\$46,897	\$0	\$2,674	\$180,500	36.5	13.1	0.0	0.7	50.3
31	American Realty	\$9,006,115	\$201,455	\$195,193	\$0	\$4,361	\$401,009	99.4	96.3	0.0	2.2	197.8
32	North Haven	\$7,937,360	\$1,480,708	\$0	\$259,168	\$3,487	\$1,743,363	828.9	0.0	145.1	2.0	976.0
33	Raven Opportunity III	\$6,464,435	\$1,100,945	\$0	\$262,848	\$3,241	\$1,367,034	756.8	0.0	180.7	2.2	939.7
Total		\$1,885,829,977	\$15,370,801	\$3,029,595	\$1,579,538	\$795,488	\$20,775,422	36.2	7.1	3.7	1.9	49.0

Cash Flow Report

Oct 2016 through Dec 2016

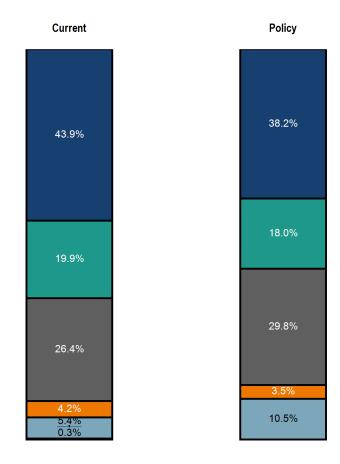
Beginning Cash Balance*	\$11,418,811
Cash Flow In	
Sales of Investments	\$9,275,000
Plan Sponsor Contributions	\$14,667,592
Employee Contributions	\$5,867,938
Employee Buybacks	\$0
Interest Income	\$0
Rental Income	\$13,086
Commission Recapture	\$0
Litigation Recovery	<u>\$0</u>
Total Cash Flow In	\$29,823,615
Cash Flow Out	
Retirement Benefits	\$27,970,327
StanCERA Payroll	\$351,102
Operations Expense	\$112,892
Pension Software	\$86,400
Fixed Asset Purchases	\$26,073
Member Refunds	\$728,337
Post Retirement Death Benefits	\$115,297
Burial Allowances	\$90,000
Retiree Death - Return of Contributions	\$20,884
Investment Consultant Fees	\$72,787
Actuarial Fees	\$79,208
Custodial Fees	\$88,770
Audit Fees	\$2,838
Legal Fees	\$49,515
Other Fees	<u>\$7,770</u>
Total Cash Flow Out	\$29,802,198
Ending Cash Balance	\$11,440,228
Change in Cash Balance	\$21,417

^{*} Prior end balances may not always equal current beginning balance due to subsequent refinement of data



	Market Value	% of Portfolio	1 Mo	YTD	Fiscal YTD
Total Fund	1,919,039,400	100.0	1.8	3.4	10.0
Policy Index			2.0	3.4	7.8
US Equity	841,503,956	43.9	2.8	4.9	17.3
US Equity Blended			3.5	5.2	15.9
Russell 3000			3.7	5.7	15.0
Mellon S&P 500	98,714,904	5.1	4.0	5.9	14.2
S&P 500			4.0	5.9	14.2
BlackRock Russell 1000 Growth	96,975,504	5.1	4.2	7.7	13.8
Russell 1000 Growth			4.2	7.7	13.7
Jackson Square	132,193,263	6.9	3.1	6.1	9.1
Russell 1000 Growth			4.2	7.7	13.7
BlackRock Russell 1000 Value	117,033,180	6.1	3.6	4.4	15.2
Russell 1000 Value			3.6	4.3	15.2
Dodge & Cox-Equity	204,075,129	10.6	2.9	5.3	26.4
Russell 1000 Value			3.6	4.3	15.2
Legato Capital	89,785,639	4.7	0.7	3.1	14.4
Russell 2000 Growth			2.5	4.1	17.8
Capital Prospects	102,726,337	5.4	0.8	1.6	23.7
Russell 2000 Value			1.4	0.7	25.1
International Equity	381,454,122	19.9	1.7	4.8	12.4
MSCI ACWI ex USA Gross			1.6	5.2	11.2
LSV Asset Mgt	194,208,536	10.1	1.7	5.2	17.1
MSCI ACWI ex USA Gross			1.6	5.2	11.2
Fidelity	187,245,586	9.8	1.6	4.3	8.0
MSCI ACWI ex USA Gross			1.6	5.2	11.2
US Fixed Income	506,552,198	26.4	0.8	1.1	1.1
BBgBarc US Aggregate TR			0.7	0.9	-1.7
Dodge & Cox-Fixed	391,041,792	20.4	0.8	1.2	1.6
BBgBarc US Aggregate TR			0.7	0.9	-1.7
PIMCO	115,510,406	6.0	0.6	1.0	-0.6
BBgBarc US Aggregate TR			0.7	0.9	-1.7

	Current	%	Policy	%
Domestic Equity	\$841,503,956	43.9%	\$733,073,051	38.2%
International Equity	\$381,454,122	19.9%	\$345,427,092	18.0%
Domestic Fixed Income	\$506,552,198	26.4%	\$571,873,741	29.8%
Real Estate	\$79,719,362	4.2%	\$67,166,379	3.5%
Alternatives	\$103,828,177	5.4%	\$201,499,137	10.5%
Cash and Equivalents	\$5,981,584	0.3%	-	
Total	\$1,919,039,400	100.0%	\$1,919,039,400	100.0%

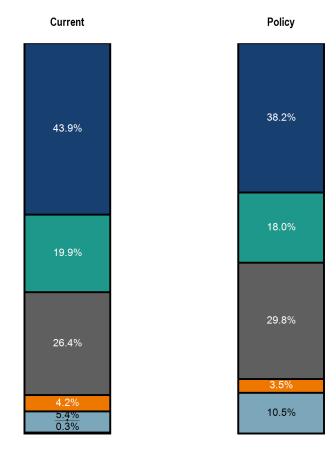


Policy Index: 14.4% Russell 1000 Value, 11.3% Russell 1000 Growth, 4.8% S&P 500, 4.0% Russell 2000 Value, 3.7% Russell 2000 Growth, 18.0% MSCI ACWI ex USA, 29.8% BBgBarc US Aggregate TR, 3.5% DJ US Select RESI, 7.5% 9% Annual, 3% CPI + 4%. US Equity Blended: 80% Russell 1000, 20% Russell 2000. All data is preliminary.



	Market Value	% of Portfolio	1 Mo	YTD	Fiscal YTD
Real Estate	79,719,362	4.2	1.3	1.0	1.5
DJ US Select RESI			3.5	2.6	-1.2
Prime Property Fund	16,890,251	0.9	0.0	0.0	4.7
NCREIF-ODCE			0.0	0.0	4.2
American Strategic Value Realty	18,851,824	1.0	0.0	0.0	5.3
NCREIF Property Index			0.0	0.0	3.5
BlackRock US Real Estate	30,801,380	1.6	3.5	2.6	-1.3
DJ US Select RESI TR USD			3.5	2.6	-1.2
Greenfield Gap	13,175,908	0.7			
Direct Lending	92,329,389	4.8			
Medley Capital	23,924,172	1.2			
Raven Capital	18,728,840	1.0			
Raven Opportunity III	15,246,539	0.8			
White Oak Pinnacle	34,429,837	1.8			
Infrastructure	11,498,788	0.6			
MS Infrastructure Partners II	11,498,788	0.6			
Cash Account	5,981,584	0.3	0.0	0.1	0.8

	Current	%	Policy	%
Domestic Equity	\$841,503,956	43.9%	\$733,073,051	38.2%
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Stanislaus County Employees' Retirement Association

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March 28, 2017

Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

I. SUBJECT: Asset Allocation and Risk Parity Review

II. ITEM NUMBER: 8.b

III. ITEM TYPE: Discussion and Action

IV. STAFF RECOMMENDATION: None

V. ANALYSIS: Each year, StanCERA is tasked to review capital market expectations and their implications on the asset allocation mix. In keeping with this mandate, this item takes a look at the revised capital market expectations and their effect on the current asset allocation and other potential mixes.

Additionally, as requested by the Board in February's meeting, a review of the risk parity asset class will be presented.

VI. RISK: None

VII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently.

VIII. ADMINISTRATIVE BUDGET IMPACT: None

Rick Santos, Executive Director

Kathy Herman, Fiscal Services Manager







MARCH 2017

Asset Allocation Annual Update

Stanislaus County Employees' Retirement Association

Table of Contents



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Asset allocation review	TABI
Executive summary	3
Asset allocation analysis	5
Next steps	16
Risk parity education	18
Appendix	TAB II
2017 Capital market assumptions	26

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Executive summary



Executive summary

- Per StanCERA's IPS approved in January 2017, "the Board will review capital market expectations annually. The
 result of this review will be used to update the Investment Resolutions as needed."
 - The Board's last review took place in May 2016 resulting in the adoption of the "FFP 6-Yr" mix.
- The objective of the annual review process is not to make large changes to the asset allocation, but rather to:
 - 1. Adjust the size of the Liquidity sub-portfolio based on projected benefit payments (if needed); and
 - 2. Make adjustments to the Growth & Risk Diversifying sub-portfolios based on updated Capital Market Assumptions and/or changes to the Liquidity sub-portfolio.
- As part of this year's review, three alternative mixes are shown:
 - Alternative Mix 1: Eliminates the allocation to private equity & risk parity while maintaining the 14% private credit target
 - Alternative Mix 2: Allocates 5% each to private equity & risk parity, and 6% to private credit
 - Alternative Mix 3: Eliminates the allocation to private equity & risk parity and reduces the private credit target to 5%
- Recommendation is to keep the current FFP 6-yr asset allocation mix as it offers the least volatility and downside risk
 while offering an expected return that is greater than the actuarial assumed rate, adjusted for inflation.



Asset allocation analysis



Plan profile

Assumptions:

- Inflation = 3.0%
- Total return = 7.25%
- Real return = 4.25%

As of June 30, 2016:

- Average monthly Plan cash flows based on the previous 24 months:
 - Total Contributions \$6.62mm
 - Total Benefit Payments & Expenses \$(8.95)mm
 - Benefit Payments \$(8.75)mm
 - Operating Expenses \$(0.20)mm
 - Net Operating Cash Inflow (Outflow) \$(2.32)mm
 - Total Interest & Dividends \$3.77mm
 - Net Cash Inflow \$1.44mm
- Total participants = 9,120 (4,249 or 46.6% active, 1,289 or 14.1% inactive, 3,582 or 39.3% retired)
- Market value of assets as of December 31, 2016 = \$1,859.7 mm
- Actuarial liability = \$2,537.1 mm
- Funded ratio = 73.3% (December 31, 2016 market value of assets)

Sources: StanCERA Comprehensive Annual Financial Reports, Cheiron Actuarial Valuation Reports



Asset allocation analysis

	Current	Phase 1	2016 FFP	Alternatives			<u>c</u>	<u>CMA's (10 Yr)</u>		
	(12/31/16)	Targets	6-Yr	No PE or RP	5% to PE 5% to RP	No PE or RP 5% PC	Return	Standard Deviation	Sharpe Ratio	
US Large	33.0	13.7	12.0	22.0	20.0	25.0	4.7	15.8	0.16	
US Small	10.1	3.4	3.0	5.0	5.0	5.0	4.8	21.8	0.12	
Private Equity	0.0	0.0	5.0	0.0	5.0	0.0	7.8	26.2	0.33	
Total Domestic Equity	43.1	17.1	20.0	27.0	30.0	30.0				
International Developed	15.8	18.3	16.0	22.0	20.0	26.0	9.7	18.9	0.40	
Emerging Markets	3.9	4.6	4.0	5.0	5.0	5.0	8.6	27.2	0.35	
Total International Equity	19.7	22.9	20.0	27.0	25.0	31.0				
Private Credit	4.9	5.6	14.0	14.0	6.0	5.0	6.5	11.8	0.37	
Core Real Estate	3.1	8.3	5.0	5.0	7.0	5.0	4.6	9.9	0.25	
Value Add Real Estate	1.7	1.7	5.0	5.0	3.0	5.0	6.6	17.9	0.25	
Total Growth Portfolio	72.5	55.6	64.0	78.0	71.0	76.0				
Core Fixed Income Cash Short-Term Gov't/Credit	27.4 0.1 0.0	8.4 1.0 18.0	0.0 1.0 18.0	0.0 1.0 18.0	0.0 1.0 20.0	0.0 1.0 20.0	3.3 2.2 2.6	6.5 1.2 3.7	0.17 0.13	
Total Liquidity Portfolio	27.5	27.4	19.0	19.0	21.0	21.0				
Risk Parity US Treasury	0.0 0.0	14.0 3.0	14.0 3.0	0.0 3.0	5.0 3.0	0.0 3.0	7.2 2.4	10.0 6.9	0.50 0.04	
Total Risk Diversifying	0.0	17.0	17.0	3.0	8.0	3.0				
Total Allocation	100.0	100.0	100.0	100.0	100.0	100.0				



Asset allocation characteristics

Risk & return characteristics

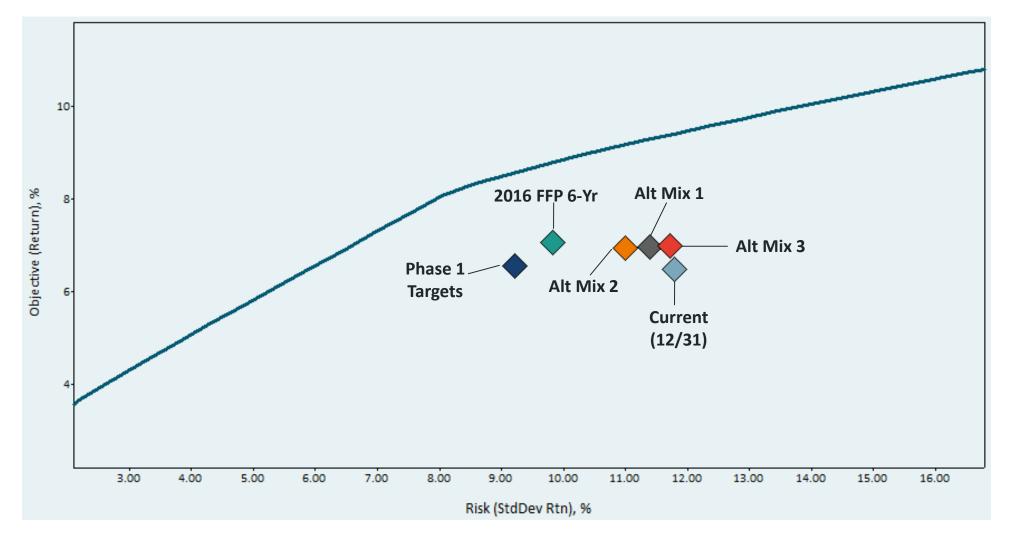
	Current (12/31/16)	Phase 1 Targets	2016 FFP 6-Yr	Alternative Mix 1	Alternative Mix 2	Alternative Mix 3
Mean Variance Analysis						
Forecast 10 Year Return	<i>5.8</i>	<i>6.2</i>	6.6	6.4	6.4	6.4
Standard Deviation	11.8	9.2	9.8	11.4	11.0	11.7
Return/Std. Deviation	0.49	0.67	0.67	0.56	0.58	0.54
1st percentile ret. 1 year	-24.9	-19.2	-20.9	-25.3	-23.3	-25.6
Sharpe Ratio	0.36	0.47	0.49	0.41	0.43	0.41
Real Return	3.74	4.07	4.51	4.26	4.27	4.26

- Compared to the FFP 6-Yr asset allocation approved in 2016, the Alternative Mixes:
 - Decrease the exposure to alternatives (private equity, private credit, risk parity);
 - Decrease the portfolio's expected return while still achieving the Plan's real return target of 4.25%;
 - Increase the expected standard deviation; and
 - Decrease the portfolio's efficiency (i.e., Sharpe Ratio).



Asset allocation characteristics

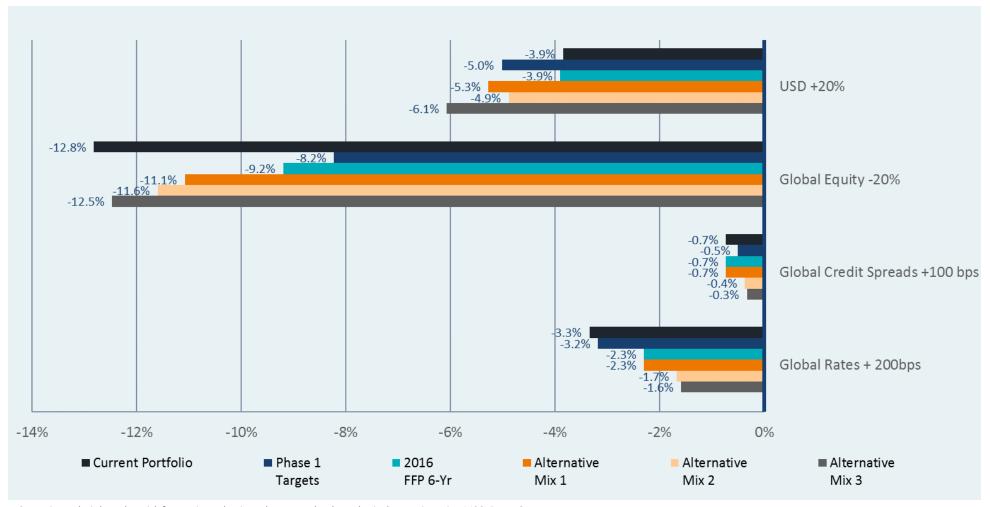
Efficient Frontier



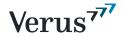


Stress test

TAIL RISK - STRESS TEST

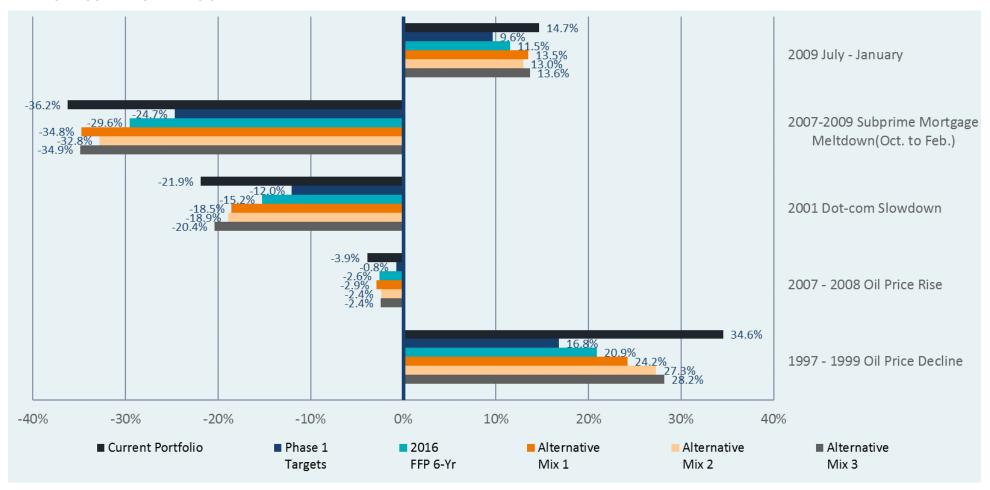


Scenario analysis based on risk factors in each mix and computed as hypothetical scenarios using MSCI Barra One

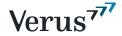


Historical scenario analysis

TAIL RISK - SCENARIO ANALYSIS

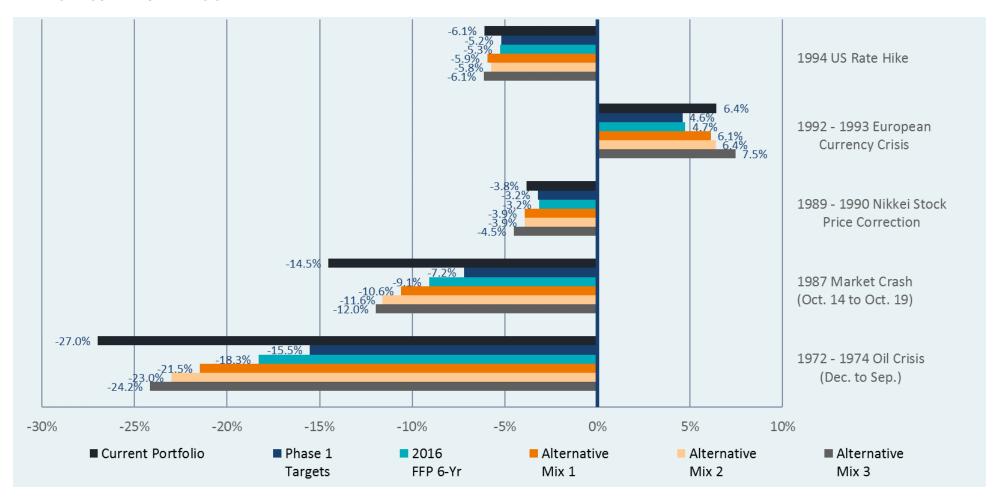


Scenario analysis based on risk factors in each mix and computed as hypothetical scenarios using MSCI Barra One



Historical scenario analysis

TAIL RISK - SCENARIO ANALYSIS

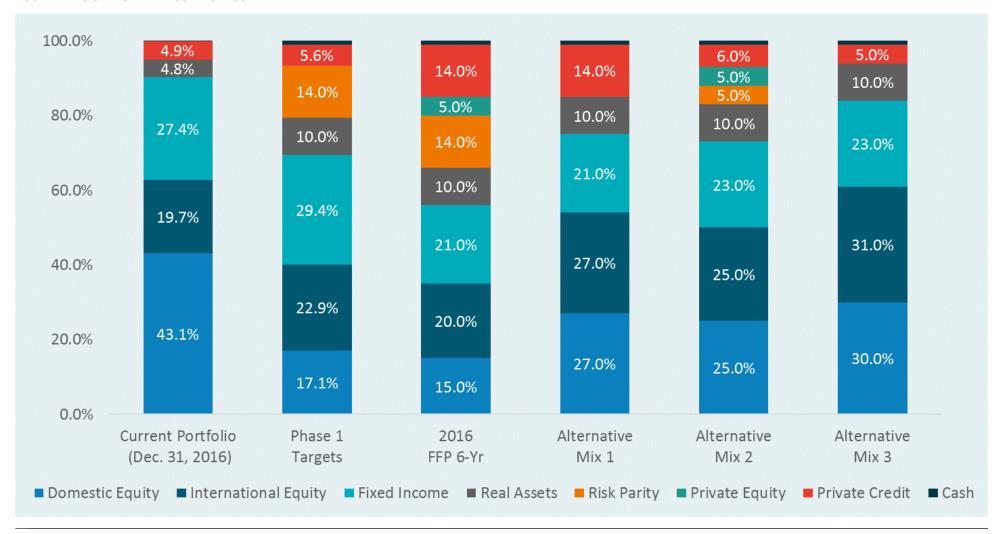


Scenario analysis based on risk factors in each mix and computed as hypothetical scenarios using MSCI Barra One



Asset allocation by asset class

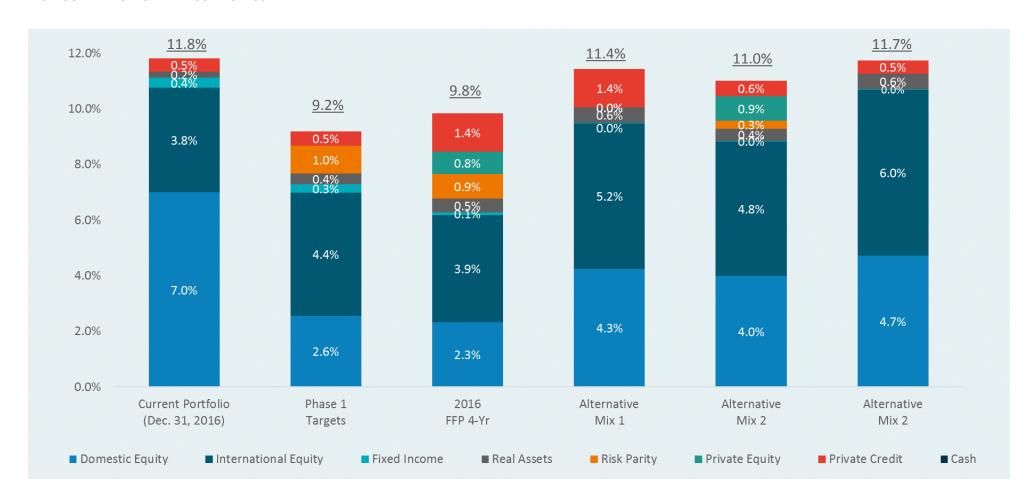
ASSET ALLOCATION BY ASSET CLASS





Risk contribution by asset class

RISK CONTRIBUTION BY ASSET CLASS

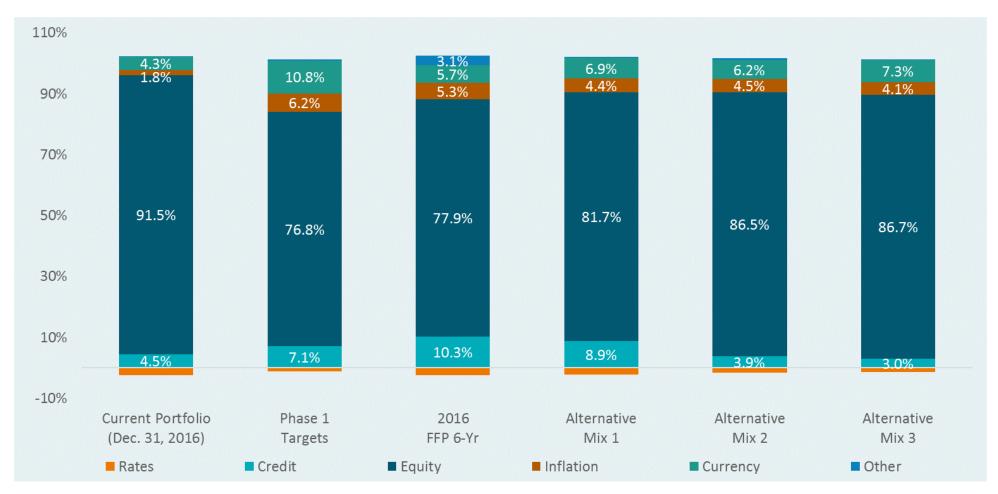


Risk contribution based on Verus' Capital Market Assumptions



Risk contribution by risk factor

RISK CONTRIBUTION BY RISK FACTOR



Risk contribution based on MSCI BarraOne's Capital Market Assumptions



Next steps

Next steps

- Recommendation is to keep the current FFP 6-yr asset allocation mix as it offers the least volatility and downside risk while offering an expected return that is greater than the actuarial assumed rate, adjusted for inflation.
- No immediate changes will be made to the portfolio's actual allocation at this time.
 - The "Phase 1 targets & ranges" approved by the Board in January 2017 set to be used during the first phase of implementation will be revised following the approval of a revised implementation plan.

Risk parity education



What is risk parity?

A long-only portfolio seeking to generate returns through persistent exposure to Global Equity, Global Fixed Income, and Global Inflation-Protected Assets

- Global Equities for upside participation in periods of strong growth
- Global Fixed Income for downside protection in periods of weaker growth
- Commodities and Global Inflation-Linked Bonds to preserve real rates of return in inflationary periods

Seeks balanced exposure for consistent performance across market environments

Risk parity vs. traditional portfolio construction

The traditional approach to portfolio construction

- Accepts the volatility level of the asset classes available in the marketplace
- Constructs a portfolio with those asset classes

This means that each asset class contributes a different level of risk to the portfolio.

A risk parity approach does two key things

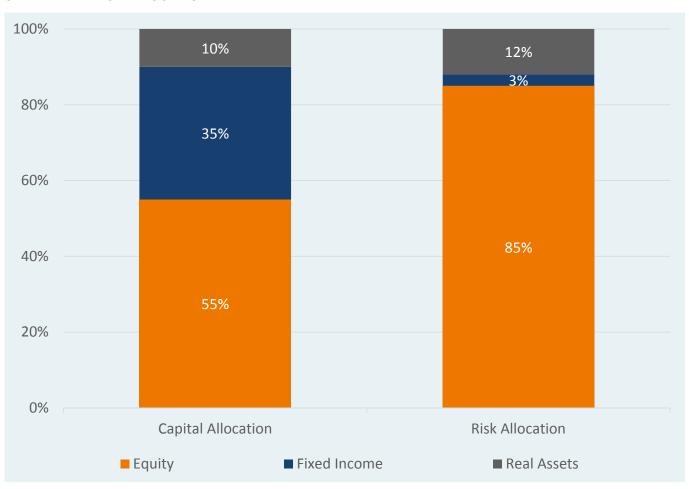
- Uses leverage to adjust the volatility of each asset class to the same level
- Weights the asset class exposures so that each asset class contributes an equal amount of expected volatility to the portfolio

This means that each asset class contributes the same level of risk to the portfolio

Risk parity is about how you choose to buy betas in your portfolio. It is not primarily a alpha-based strategy.

Traditional portfolio

CAPITAL AND RISK ALLOCATION



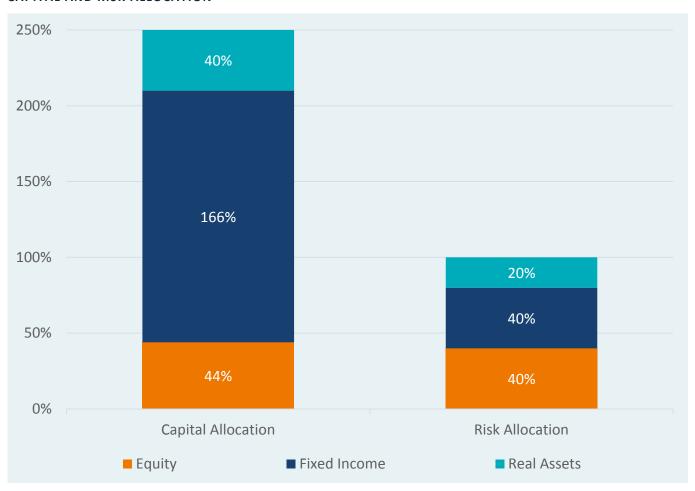
The Traditional Approach may result in the Plan closely tracking the outcome of the equity market.

Source: PanAgora Asset Management, Inc.



Risk parity portfolio

CAPITAL AND RISK ALLOCATION



The Risk Parity
Approach, through the use of leverage, weights assets so that all investments influence the portfolio similarly.

Source: PanAgora Asset Management, Inc.



Leverage in portfolios

Just like Risk Parity, most investments contain leverage

- Public and Private Equity, Real Estate, Infrastructure, and Hedge Funds
 - Leverage is embedded throughout the portfolio but often encapsulated
- Securitization (or in the case of Risk Parity commingled fund) allows it to be non-recourse leverage

In Risk
Parity,
leverage is
generally
obtained
through the
use of
futures.

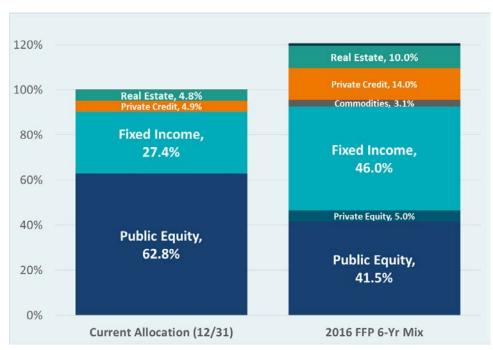
Risks of leverage can be controlled with good risk management

- Applying leverage to the safest & lowest volatility assets (i.e., Treasuries, TIPS)
- Explicit strategy level limits on notional exposure
- Active rebalancing to target constant and balanced market risk
- Maintaining high levels of unencumbered cash
- Utilizing instrument leverage through exchange-traded and centrally cleared futures (not borrowed leverage)

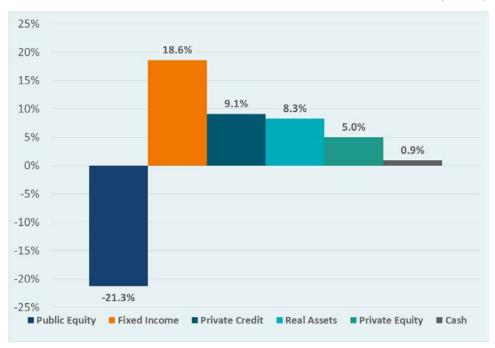
Asset class exposure look through

- The charts below show the estimated notional exposure of StanCERA's actual portfolio (as of 12/31) & the 2016 FFP 6-Yr mix which includes a 14% allocation to risk parity
 - Equity allocation decreases with the implementation of the proposed asset allocation with risk parity
 - The increase in total exposure comes predominantly from fixed income

STANCERA TOTAL PORTFOLIO NOTIONAL EXPOSURE



2016 FFP6-YR MIX NOTIONAL RELATIVE TO CURRENT ALLOCATION (12/31)



Risk Parity exposures assume 50% Panagora / 50% AQR. Exposures as of 12/31/16.



Adding risk parity to client portfolios

As we add Risk Parity we improve outcomes

- A benchmark portfolio had incremental amounts of Risk Parity added
- Other asset allocations were simply reduced proportionally
- Sharpe ratios increased through the addition of Risk Parity
- 50th percentile return increased with the addition of Risk Parity
- The poorest outcomes were mitigated with Risk Parity

	Typical Peer	+5% RP	+10% RP	+20% RP				
Volatility								
	10.0	9.9	9.8	9.5				
Sharpe Ratio	0							
	0.43	0.45	0.46	0.48				
Median (50 ^t	th percentile) F	orecasted Returr	ı					
	5.99	6.06	6.13	6.26				
1 Year (1st Percentile) Drawdown								
	-23.29	-22.56	-21.90	-20.62				

Typical Peer is based on BNY Mellon Universe data of DB Plans >\$2 Billion and is composed of 45% Global Equity, 35% Core Fixed Income, 5% Private Equity, 5% Real Estate, 5% Hedge Funds, and 5% Commodities



Appendix — 2017 Capital market assumptions





Table of contents



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Summary	21	Alternatives	41
Inflation	29	Appendix	48
Fixed income	31		
Equities	37		

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Summary



Methodology

CORE INPUTS

- We use a fundamental building block approach based on several inputs, including historical data and academic research to create asset class return forecasts.
- For most asset classes, we use the long-term historical volatility after adjusting for autocorrelation.
- Correlations between asset classes are calculated based on the last 10 years. For illiquid assets, such as private equity and private real estate, we use BarraOne correlation estimates.

Asset	Return Methodology	Volatility Methodology*
Inflation	25% weight to the University of Michigan Survey 5-10 year ahead inflation expectation and the Survey of Professional Forecasters (Fed Survey), and the remaining 50% to the market's expectation for inflation as observed through the TIPS breakeven rate	-
Cash	Real yield estimate + inflation forecast	Long-term volatility
Bonds	Nominal bonds: current annualized yield Real bonds: real yield + inflation forecast	Long-term volatility
International Bonds**	Current yield + implied currency effect	Long-term volatility
Credit	Current option-adjusted-spread + U.S. 10-year Treasury – default rate	Long-term volatility
International Credit**	Current option-adjusted-spread + foreign 10-year Treasury – default rate + implied currency effect	Long-term volatility
Private Credit	High yield forecast + 2% illiquidity premium	Long-term volatility
Equity	Dividends (current yield) + real earnings growth (historical average) + inflation on earnings (inflation forecast) + expected P/E change	Long-term volatility
International Developed Equity**	Dividends (current yield) + real earnings growth (historical average) + inflation on earnings (international inflation forecast) + expected P/E change + implied currency effect	Long-term volatility
Private Equity	Small-cap domestic equity forecast + 3% illiquidity premium	1.2 * Long-term volatility of U.S. small cap
Commodities	Cash + inflation forecast	Long-term volatility
Hedge Funds	Return coming from traditional betas + 3% (alternative beta and alpha)	1.65 * Long-term volatility
Hedge Funds (FoF)	Return coming from traditional betas + 3% (alternative beta and alpha) – 1% expected fund of funds management fee	1.65 * Long-term volatility
Core Real Estate	Cap rate – capex + Inflation forecast	50% of REIT volatility
REITs	Core real estate	Long-term volatility
Value-Add Real Estate	Core real estate + 2%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Opportunistic Real Estate	Core real estate + 4%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Risk Parity	Expected Sharpe Ratio * target volatility + cash rate	Target volatility
*! +	lity data is adjusted for autocorrelation (See Appendix)	

^{*}Long-term historical volatility data is adjusted for autocorrelation (See Appendix)

^{**}We use local inflation for international developed equity and fixed income markets. When using local inflation rates, expected returns are adjusted for the implied currency effect based on currency forward contract rates (See Appendix)



Correlation assumptions

	Cash	US Large	US Small	Developed Large	Developed Small	EM	Global Equity	PE	US TIPS	US Treasury	Global Sovereign ex US	US Core	US Core Plus	Short – Term Govt/Credit	Term	Term	US HY	Bank Loans	Global Credit	EMD USD	EMD Local	Commo dities	Hedge Funds	Real Estate	REITs	Risk Parity	Inflation
Cash	1.0																										
US Large	-0.2	1.0																									
US Small	-0.2	0.9	1.0																								
Developed Large	-0.1	0.9	0.8	1.0																							
Developed Small	-0.2	0.8	0.8	1.0	1.0																						
EM	-0.1	0.8	0.7	0.9	0.9	1.0																					
Global Equity	-0.1	1.0	0.9	1.0	0.9	0.9	1.0																				
PE	-0.2	0.7	0.7	0.6	0.5	0.5	0.7	1.0																			
US TIPS	0.1	0.2	0.1	0.3	0.3	0.4	0.3	0.0	1.0																		
US Treasury	0.1	-0.3	-0.3	-0.2	-0.2	-0.2	-0.3	-0.2	0.6	1.0																	
Global Sovereign ex US	0.1	0.2	0.1	0.4	0.4	0.4	0.3	-0.1	0.6	0.5	1.0																
US Core	0.1	0.0	-0.1	0.1	0.1	0.2	0.1	-0.1	0.8	0.9	0.6	1.0															
US Core Plus	-0.1	0.3	0.3	0.5	0.5	0.5	0.5	0.0	0.7	0.5	0.5	0.8	1.0														
Short –Term Govt/Credit	0.4	-0.1	-0.1	0.1	0.1	0.1	0.0	-0.2	0.6	0.6	0.6	0.7	0.5	1.0													
Short-Term Credit	0.1	0.3	0.2	0.5	0.5	0.5	0.4	-0.2	0.5	0.2	0.5	0.5	0.8	0.6	1.0												
Long-Term Credit	-0.1	0.3	0.2	0.4	0.4	0.4	0.4	-0.1	0.6	0.5	0.5	0.8	1.0	0.4	0.6	1.0											
US HY	-0.2	0.7	0.7	0.8	0.8	0.8	0.8	0.4	0.4	-0.2	0.3	0.2	0.6	0.1	0.6	0.5	1.0										
Bank Loans	-0.2	0.6	0.6	0.6	0.6	0.6	0.6	0.2	0.2	-0.4	0.0	0.0	0.4	-0.2	0.5	0.3	0.8	1.0									
Global Credit	-0.1	0.6	0.5	0.8	0.8	0.8	0.7	0.2	0.6	0.2	0.7	0.6	0.8	0.5	0.7	0.8	0.8	0.5	1.0								
EMD USD	-0.1	0.6	0.5	0.7	0.7	0.7	0.7	0.3	0.7	0.3	0.5	0.6	0.8	0.4	0.6	0.7	0.8	0.5	0.9	1.0							
EMD Local	0.1	0.6	0.6	0.8	0.7	0.8	0.7	0.3	0.5	0.1	0.7	0.4	0.6	0.4	0.5	0.5	0.7	0.4	0.8	0.8	1.0						
Commodities	0.0	0.5	0.4	0.6	0.6	0.7	0.6	0.2	0.3	-0.2	0.4	0.1	0.3	0.2	0.4	0.2	0.5	0.4	0.6	0.5	0.6	1.0					
Hedge Funds	-0.1	0.7	0.6	0.8	0.8	8.0	0.8	0.6	0.2	-0.3	0.1	0.0	0.4	0.0	0.4	0.3	0.7	0.6	0.6	0.5	0.5	0.6	1.0				
Real Estate	-0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.2	0.2	0.2	0.0	0.2	1.0			
REITs	-0.1	0.7	0.8	0.7	0.6	0.6	0.7	0.5	0.3	0.0	0.3	0.3	0.5	0.1	0.3	0.4	0.7	0.5	0.6	0.6	0.6	0.3	0.4	0.4	1.0		
Risk Parity	0.1	0.5	0.4	0.6	0.6	0.6	0.6	0.0	0.7	0.4	0.6	0.6	0.7	0.5	0.6	0.6	0.5	0.3	0.8	0.7	0.7	0.6	0.5	-0.1	0.4	1.0	
Inflation	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-0.2	0.0	-0.1	-0.1	0.0	-0.1	-0.2	0.2	0.3	0.1	0.1	0.1	0.3	0.3	0.1	0.1	0.0	1.0

Note: Correlation assumptions are based on the last ten years. Private Equity and Real Estate correlations are especially difficult to model – we have therefore used BarraOne correlation data to strengthen these correlation estimates.



10 year return & risk assumptions

		Ten Year Re	turn Forecast	Standard Deviation	Sharpe Ratio (g)	Sharpe Ratio (a)	Ten Year Historical	Ten Year Historical	
Asset Class	Index Proxy	Geometric	Arithmetic	Forecast	Forecast	Forecast	Sharpe Ratio (g)	Sharpe Ratio (a)	
Equities									
US Large	S&P 500	4.7%	5.9%	15.8%	0.16	0.24	0.39	0.45	
US Small	Russell 2000	4.8%	7.0%	21.8%	0.12	0.22	0.30	0.39	
International Developed	MSCI EAFE	9.7%	11.3%	18.9%	0.40	0.48	-0.02	0.07	
International Small	MSCI EAFE Small Cap	8.1%	10.5%	23.3%	0.26	0.36	0.09	0.19	
Emerging Markets	MSCI EM	8.6%	11.8%	27.2%	0.24	0.35	0.04	0.16	
Global Equity	MSCI ACWI	7.0%	8.4%	17.9%	0.27	0.35	0.15	0.23	
Private Equity	Cambridge Private Equity	7.8%	10.8%	26.2%	0.22	0.33	0.88	0.89	
Fixed Income									
Cash	30 Day T-Bills	2.2%	2.2%	1.2%	-	-	-	-	
US TIPS	Barclays US TIPS 5 - 10	2.6%	2.7%	5.7%	0.08	0.10	0.57	0.59	
US Treasury	Barclays Treasury 7 - 10 year	2.4%	2.7%	6.9%	0.04	0.08	0.70	0.72	
Global Sovereign ex US	Barclays Global Treasury ex US	2.8%	3.3%	10.0%	0.07	0.12	0.23	0.27	
Core Fixed Income	Barclays US Aggregate Bond	3.3%	3.5%	6.5%	0.17	0.20	1.07	1.06	
Core Plus Fixed Income	Barclays US Corporate IG	3.9%	4.2%	8.5%	0.20	0.24	0.75	0.76	
Short-Term Gov't/Credit	Barclays US Gov't/Credit 1 - 3 year	2.6%	2.7%	3.7%	0.13	0.14	1.45	1.44	
Short-Term Credit	Barclays Credit 1 - 3 year	2.8%	2.9%	3.5%	0.17	0.20	1.08	1.07	
Long-Term Credit	Barclays Long US Corporate	3.7%	4.2%	9.6%	0.17	0.21	0.56	0.59	
High Yield Corp. Credit	Barclays High Yield	4.5%	5.2%	11.8%	0.20	0.26	0.60	0.63	
Bank Loans	S&P/LSTA	4.5%	5.1%	10.8%	0.22	0.27	0.45	0.48	
Global Credit	Barclays Global Credit	2.0%	2.3%	7.8%	-0.03	0.01	0.50	0.53	
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	5.8%	6.6%	13.0%	0.28	0.34	0.66	0.69	
Emerging Markets Debt (Local)	JPM GBI EM Global Diversified	6.5%	7.2%	13.4%	0.35	0.41	0.22	0.28	
Private Credit	High Yield + 200 bps	6.5%	7.2%	11.8%	0.37	0.43	-	-	
Other									
Commodities	Bloomberg Commodity	4.3%	5.5%	16.1%	0.13	0.21	-0.37	-0.35	
Hedge Funds	HFRI Fund of Funds	6.0%	6.8%	13.2%	0.29	0.35	0.08	0.10	
Hedge Funds (Fund of Funds)	HFRI Fund of Funds	5.0%	5.8%	13.2%	0.22	0.28	-	-	
Core Real Estate	NCREIF Property	4.6%	5.1%	9.9%	0.25	0.29	1.03	1.03	
Value-Add Real Estate	NCREIF Property + 200bps	6.6%	8.1%	17.9%	0.25	0.33	-	-	
Opportunistic Real Estate	NCREIF Property + 400bps	8.6%	11.5%	26.0%	0.25	0.46	-	-	
REITs	Wilshire REIT	4.6%	6.4%	19.7%	0.1	0.21	0.15	0.28	
Risk Parity		7.2%	7.7%	10.0%	0.50	0.55	-	-	
Inflation		2.1%	-	1.4%*	-	-	-	-	

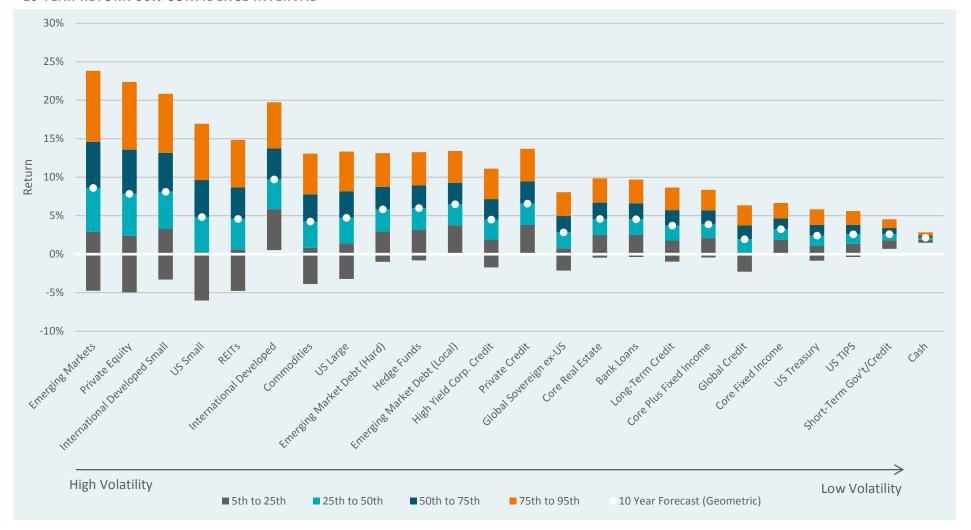
Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

^{*}Historical volatility of inflation. This is not a forecast.



Range of likely 10 year outcomes

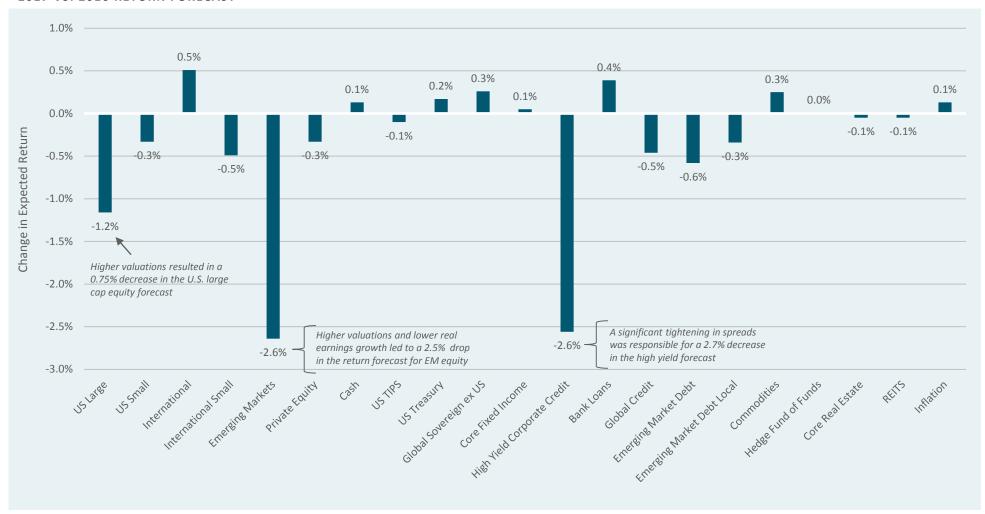
10 YEAR RETURN 90% CONFIDENCE INTERVAL





2017 vs. 2016 return forecast

2017 VS. 2016 RETURN FORECAST





Relevant forecast changes

- Valuations for U.S. large cap equities continued to move higher during the year as increases in prices outpaced modest gains in earnings. At year-end, the Shiller P/E ratio was 28.0 and the trailing 12-month P/E ratio was 20.9. The rise in these valuation metrics resulted in a repricing assumption of -1.25% per year, compared to only -0.50% in last year's forecast. Additionally, we changed our methodology for calculating an average real earnings growth rate to only include data from 1972 to allow for better comparisons between asset classes. This change resulted in a 0.5% lower forecast than last year.
- Our forecast for international developed large cap equities rose 0.5%, mainly driven by a higher currency effect forecast. Our methodology includes an adjustment based on implied currency movements, as indicated by the forward curve. A steeper forward curve resulted in a 0.7% higher forecast than then previous year. Please see the next page for more detail on our currency adjustment methodology.
- For international developed small cap equities, the higher currency effect was more than offset by rising valuations. The trailing 12-month P/E ratio rose to 34.8 from 23.5, and resulted in a 1.0% decrease in the return forecast.
- Emerging markets equities performed well over the year, and valuation metrics rose off of historic lows. The Shiller P/E ratio rose to 8.7 from 8.1 and the trailing 12-month P/E ratio rose to 15.4 from 12.2. The upward move in valuations resulted in a change in the repricing assumption from 2.0% per year to only 0.5% per year. Falling average 10-year real earnings growth detracted an additional 1.0% from the return forecast.
- Modest rises in Treasury yields and inflation premiums helped move U.S. fixed income nominal return forecasts slightly higher than the previous year.
- Tightening spreads in high yield corporate fixed income led to significantly lower return forecasts. High yield spreads to Treasuries fell 274 bps over the course of the year.
- Spreads also compressed in global credit relative to global sovereign bonds, which resulted in a 0.5% decrease in return forecast.
- The return forecast for emerging market U.S. dollar denominated debt fell 0.6%, mainly driven by a 75 bps compression in spreads.
- Yields in emerging market local debt fell from 7.1% to 6.8%, leading to a 0.3% decline in expected return from the prior year.



The currency effect

- This last year has re-emphasized the important effect that currency returns can have on unhedged international portfolios. Verus
 has traditionally taken the view that we do not attempt to forecast currency market movement.
- When forecasting currencies, the "no opinion" position is reflected in the currency forward markets. This market prices currencies at a range of forward dates based on interest rate differentials they represent the SPOT currency price for FORWARD delivery.
 Divergence from these rates is described as currency surprise.
- Investors with no active opinion regarding which direction exchange rates are headed would expect to earn the local currency return of foreign assets after correcting for the forward exchange rate (as priced by the currency forward market). We describe these returns as "hedged".
- An investor with no active view regarding which direction exchange rates are headed would expect the unhedged and hedged returns from a foreign asset exposure to be identical.
- We therefore forecast foreign assets in local currency terms, then correct for expected currency movement based on currency forward market prices. We do this using 10-year forward rates. Because Verus has not historically expressed a view on currency, this is directly comparable to our previous forecasts.
- The forward curve is priced based on interest rate differentials between countries. A currency with a higher interest rate is expected to depreciate relative to a currency with a lower interest rate. Given the relatively higher yields in the U.S., the dollar is expected to depreciate against most currencies over the next 10 years. This positive currency effect added 0.6% to our global credit return forecast and 2.2% to our international equity forecasts.

Inflation

Inflation

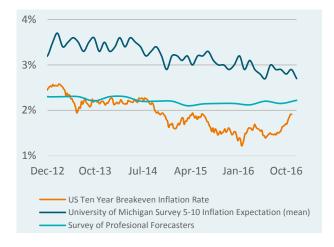
The market's expectations for 10-year inflation can be inferred by taking the difference between the U.S. 10-year Treasury yield and the U.S. 10-year Treasury Inflation-Protected (TIPS) yield (referred to as the breakeven inflation rate).

Breakevens reached very low levels during 2016 but rebounded in the fourth quarter following U.S. elections, which raised the probability of fiscal stimulus and buoyed consumer and business sentiment. Inflation expectations remain relatively low through the downward trend appears to have reversed.

The latest University of Michigan Survey 5-10 year forward inflation expectation, a survey of about 500 households around the nation, is 2.3%, slightly weaker than a year ago. Historically, this survey of inflation tends to be higher than actual future inflation.

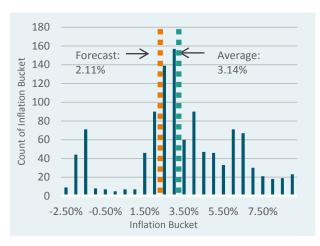
A more stable indicator over time has been the Survey of Professional Forecasters (conducted quarterly). The most recent expectation for long-term inflation is 2.11%.

INFLATION EXPECTATIONS



Source: U. of Michigan, Philly Fed, as of 12/31/16

US 10YR ROLLING AVERAGE INFLATION SINCE 1923



Source: Bloomberg, as of 10/31/16

FORECAST

	10-Year Forecast
University of Michigan Survey (25% weight)	2.30%
Survey of Professional Forecasters (25% weight)	2.22%
US 10-Year TIPS Breakeven Rate (50% weight)	1.95%
Inflation Forecast	2.11%

Source: Verus



Fixed income



Cash

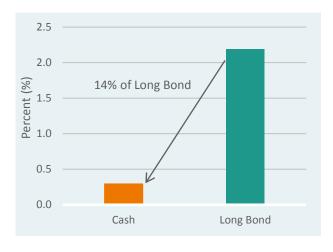
In 2016 the yield curve fell lower and flatter, but returned to previous levels and shape in the fourth quarter as inflation expectations rose. Future actions by the Fed and changing inflation expectations will likely guide curve shape and steepness over the coming year.

Over rolling ten year time periods, the average historical real return to cash has been 14% of the real return to long bonds.

By applying this historical real return relationship, we arrive at a 4 bps expected real return to cash (14% of our 34 bps long bond real return forecast).

Adding our inflation forecast of 2.11% results in a nominal return to cash of 2.15%.

U.S. TREASURY ACTIVES CURVE



AVERAGE REAL RETURN



Source: Bloomberg, as of 12/31/16

FORECAST

	10-Year Forecast
Cash	2.15%
Inflation Forecast	2.11%
Real Return	0.04%
Real Return	0.04%

Source: Verus



Source: Bloomberg

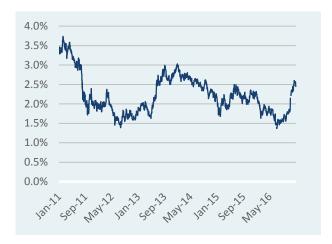
Rates

U.S. Treasury yields remain high relative to other developed nations. Yields rose sharply following U.S. elections and upon rising inflation expectations.

Central banks across the developed world continue to diverge with regard to monetary policies. While the U.S. tightens very moderately, the European Union continues stimulus but at a slowing pace, and Japan maintains unprecedented stimulus with the goal of higher spending and inflation.

Our forecast of rates is based upon the current yield, with all cash flows reinvested at the current yield.

U.S. 10-YR TREASURY RATE



Source: Bloomberg, as of 12/31/16

MARKET ESTIMATE OF 10 YEAR RATE 1 YEAR OUT



Source: Bloomberg, as of 12/31/16

FORECAST

	10-Year Forecast
US 10-Year Treasury	2.44%
Inflation Forecast	-2.11%
Real Return	0.34%

Source: Verus



Real rates

TIPS provide high sensitivity to duration (interest rate risk) over short periods and track inflation (CPI) fairly well over longer periods. Changing inflation expectations, demand for inflation protection, and rate movements contribute to price volatility of TIPS.

The U.S. 10-yr real yield dipped to around zero following the start of the year with declining Treasury yields, then rose in the fourth quarter along with expectations for higher inflation.

To arrive at a nominal 10-year forecast, we add the current real TIPS yield to our 10-year inflation forecast.

NOMINAL YIELD VS. REAL



INFLATION EXPECTATIONS



Source: Bloomberg, as of 12/31/16

FORECAST

	10-Year Forecast
US 10-Year TIPS Yield	0.47%
Inflation Forecast	+2.11%
Nominal Return	2.58%

Source: Verus



Source: Bloomberg, as of 12/31/16

Core fixed

Credit fixed income return is composed of a bond term premium (duration) and credit spread.

We use appropriate default rates and credit spreads for each fixed income category to provide our 10-year return forecast. Our default rate assumption is derived from a variety of sources, including historical data and academic research. The effective default that is subtracted from the return forecast is based on our assumed default and recovery rates.

Spreads remain slightly below the 30-year average, but exhibit behavior consistent with later stages of the economic cycle.

Conditions in the credit markets do not appear stretched, and credit expansion may continue for some time along with the broader economy. Corporate defaults have subsided somewhat as much of the recent spike was a result of isolated difficulties in the energy sector.

US CORE CREDIT SPREAD



Source: Barclays, as of 12/31/16

ROLLING EXCESS RETURN (10YR)



Source: Barclays, as of 11/30/16

FORECAST

	10-Year Forecast
Barclays US Option- Adjusted Spread	+0.92%
Effective Default	-0.10%
US 10-Year Treasury	+2.44%
Nominal Return	3.26%
Inflation Forecast	-2.11%
Real Return	1.16%

Source: Verus



Credit summary

	Core	Long-Term Credit	Global Credit	High Yield	Bank Loans	EM Debt (USD)	EM Debt (Local)	Private Credit
Index	BC US Aggregate	BC Long US Corporate	BC Global Credit	BC US High Yield	S&P LSTA	JPM EMBI	JPM GBI	BC US High Yield + 2%
Method	OAS + US 10-Year	OAS + US 10-Year	OAS + Global 10-Year Treasuries	OAS + US 10-Year	LIBOR + Spread	OAS + US 10-Year	Current Yield	High Yield + 2% illiquidity premium
Spread to	Intermediate US Treasury	Long-Term US Treasury	Global Long-Term Treasuries	Intermediate US Treasury	LIBOR	Intermediate US Treasury	-	-
Default Assumption	-0.5%	-4.5%	-3.0%	-3.8%	-3.5%	-0.5%	-0.5%	-
Recovery Assumption	80%	95%	40%	40%	90%	60%	40%	-
Spread	0.9%	1.5%	1.2%	4.4%	3.9%	3.6%	-	-
Yield	-	-	-	-	-	-	6.8%	-
Risk Free Yield	2.4%	2.4%	1.9%	2.4%	1.0%	2.4%	-	-
Effective Default	-0.1%	-0.2%	-1.8%	-2.3%	-0.4%	-0.2%	-0.3%	-
Expected Currency Effect	-	-	0.6%	-	-	-	-	-
Nominal Return	3.3%	3.7%	2.0%	4.5%	4.5%	5.8%	6.5%	6.5%
Inflation Forecast	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%
Real Return	1.2%	2.2%	-0.2%	2.4%	2.4%	3.7%	4.4%	4.4%

^{*}We use local inflation for international developed equity and fixed income markets. When using local inflation rates, expected returns are adjusted for the implied currency effect based on currency forward contract rates (See Appendix)



Equities

Equities

Investment returns in the equity space can be broken down into earnings growth, dividend yield, inflation, and repricing. Over the very long-term, repricing represents a small portion of return to equity investors, but over shorter time frames, the effect on return can vary considerably.

If investors are willing to pay more for earnings, it could signal that investors are more confident in positive earnings growth going forward, while the opposite is true if investors pay less for earnings. It is somewhat surprising that investor confidence varies so much given that the long-term earnings growth is relatively stable.

Investor confidence in earnings growth can be measured using both the Shiller P/E ratio and the trailing 12-month P/E ratio. We take an average of these two valuations metrics when determining our repricing assumption. In short, if the P/E ratio is too high (low) relative to history, we expect future returns to be lower (higher) than the long-term average. Implicit in this analysis is the assumption that P/E's will exhibit mean reversion over 10 years.

We make a conservative repricing estimate given how widely repricing can vary over time. We then skew the repricing adjustment because the percentage change in index price is larger with each incremental rise in P/E when P/E's are low, compared to when they are high.

TRAILING 10-YR S&P 500 RETURN COMPOSITION



Source: Shiller, Standard & Poor's, as of 9/30/16

U.S. LARGE SHILLER P/E



Source: Shiller, as of 7/31/16

P/E REPRICING ASSUMPTION

	Average P/E Percentile			Repricing
	Bucket	Lower P/E	Upper P/E	Assumption
	Lower 10%	-	10	2.00%
	10% - 20%	10	13	1.50%
	20% - 30%	13	15	0.75%
	30% - 45%	15	18	0.50%
	45% - 55%	18	19	0.0%
	55% - 70%	19	21	-0.25%
	70% - 80%	21	22	-0.50%
	80% - 90%	22	24	-1.25%
	Top 10%	24	-	-1.50%



Global equity

Global Equity is a combination of U.S. large, international developed, Canada, and emerging market equities. We can therefore combine our existing return forecasts for each of these asset classes, along with a Canada equity forecast, to arrive at our global equity return forecast.

We use the MSCI ACWI Index as our benchmark for global equity and apply the country weights of this index to determine the weightings for our global equity return calculation. As with other equity asset classes, we use the historical standard deviation of the benchmark (MSCI ACWI Index) for our volatility forecast.

The valuation of global equities are driven by the richness/cheapness of the underlying markets, as indicated by the current price/earnings ratio.

We believe the global equity market (MSCI ACWI) is the proper starting point for building an equity portfolio, and that deviating from a global allocation is a form of active management, and may effect long-term risk-adjusted returns.

GLOBAL EQUITY P/E RATIO HISTORY



Source: MSCI, as of 12/31/16

MARKET PERFORMANCE (3YR ROLLING)



Source: MSCI, Standard & Poor's, as of 12/31/16

FORECAST

Market	Weight	CMA return	Weighted return
US Large	53.8%	4.73%	2.54%
Developed Large	32.5%	9.72%	3.16%
Emerging Markets	10.5%	8.61%	0.90%
Canada	3.3%	7.07%	0.23%
Global equity forecast			7.00%



Equity summary

.4	S&P 500				
ndex	3&P 300	Russell 2000	MSCI EAFE Large	MSCI EAFE Small	MSCI EM
Vlethod	Building Block Approach: curr	ent dividend yield + historical ave	rage real earnings growth + infla	tion on earnings + repricing + expe	cted currency effect
Current Shiller P/E Ratio	28.0	43.8	14.5	-	8.7
Regular P/E Ratio	20.9	48.7	22.9	34.8**	15.4
2016 Shiller P/E Expansion	14.8%	19.0%	2.1%	-	6.8%
2016 Regular P/E Expansion	14.2%	45.4%	20.5%	48.0%	26.0%
Current Shiller P/E Percentile Rank	85%	100%	17%	-	7%
Current Regular P/E Percentile Rank	81%	98%	68%	78%**	62%
Average of P/E Methods' Percentile Rank	83%	99%	43%	78%**	35%
2016 Total Return	12.0%	21.3%	1.0%	2.2%	11.2%
Shiller PE History	1982	1988	1982	Not Enough History	2005
ong-Term Average Shiller P/E	22.4	29.5	23.0	-	16.2
Current Dividend Yield	2.1%	1.5%	3.2%	2.4%	2.9%
ong-Term Average Real Earnings Growth	1.8%	2.8%	2.2%	2.4%	3.5%
nflation on Earnings	2.1%	2.1%	1.5%*	1.5%*	2.1%
Repricing Effect (Estimate)	-1.3%	-1.5%	0.5%	-0.5%	0.5%
mplied Currency Effect*	-	-	2.2%*	2.2%*	-
Nominal Return	4.7%	4.8%	9.7%	8.1%	8.6%
nflation Forecast	2.1%	2.1%	2.1%	2.1%	2.1%
Real Return	2.6%	2.7%	7.6%	6.0%	6.5%

^{*}We use local inflation for international developed equity and fixed income markets. When using local inflation rates, expected returns are adjusted for the implied currency effect based on currency forward contract rates (See Appendix)

NOTE: For all equities, we exclude data prior to 1972, which allows for a more appropriate comparison between data sets.



^{**}Average trailing P/E from previous 12 months is used

Alternatives



Private equity

Private equity and public equity returns are historically correlated because the underlying economic forces driving these asset class returns are quite similar.

The return relationship between the two can vary in the short-term, but over the long-term investors have traditionally believed the return from private equity should carry a premium, based on the illiquidity investors experience. However, we believe this variation may be attributable more to active management than to a natural illiquidity

premium. We plan to investigate these effects further in 2017 and will adjust assumptions as appropriate, depending on the conclusions.

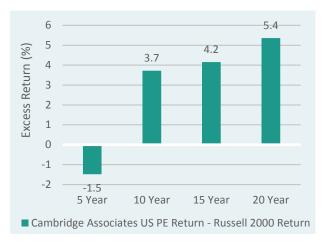
Our approach is to estimate an active management (alpha) and illiquidity premium of 3.0% on top of our U.S. small cap forecast of 4.8%.

ROLLING 3YR PRIVATE EQUITY EXCESS RETURN (PE – U.S. SMALL CAP)



Source: Cambridge, Russell, as of 8/31/16

PRIVATE EQUITY EXCESS RETURN



Source: Cambridge, Russell, as of 8/31/16

FORECAST

	10-Year Forecast
Small Cap Forecast	+4.84%
Active Management & Illiquidity Premium Estimate	+3.00%
Nominal Return	7.84%
Inflation	-2.11%
Real Return	5.74%



Hedge funds

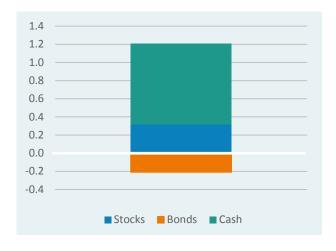
Traditional betas explain perhaps half of the variation in broad hedge fund net of fee returns, depending on the regression used. The remaining unexplained portion can be attributed to alternative betas, skill, luck, or biases in the index. We develop the systematic component of return by applying the historical weights of each traditional beta to our capital market assumptions.

As estimated by Ibbotson-Chen-Zhu 2010, the annualized unexplained portion of net of fee return is approximately 3.0%, which is statistically significant. This estimate is added to our estimate of return coming

from traditional betas to get a total net of fee return. Additionally, we produce a return forecast for hedge fund of funds, which subtracts 1% for the extra layer of fees.

Our research team is working towards better identifying the underlying return drivers of broad hedge fund index returns, and also of specific hedge fund style indices. Additional information is provided in the Appendix of this document regarding hedge fund return behavior.

HISTORICAL BREAKDOWN OF BETAS



Source: Ibbotson-Chen-Zhu 2010

Returns Explained by Systematic Factors

Equity market betas
Other traditional betas (bond, credit)
Alternative betas (value, carry, momentum, volatility)
Returns NOT Explained by Systematic Factors
Returns NOT Explained by Systematic Factors Skill
Skill

Source: Ilmanen, Antti. Expected Returns

Traditional Betas	Weight	2016 CMA (asset class average)	10-Year Forecast (weight*2016 CMA)	
Equity	32%	5.96%	1.91%	
Bonds	-21%	3.87%	-0.81%	
Cash	89%	2.15%	1.92%	
Traditional Bet	3.01%			
Alternative Bet	Alternative Beta, Skill			
Nominal Return	Nominal Return			
Inflation			-2.11%	
Real Return			3.90%	



Private core real estate/REITS

Performance of the NCREIF property index can be decomposed into an income return (cap rate) and capital return. The return coming from income has historically been more stable than the return derived from capital changes.

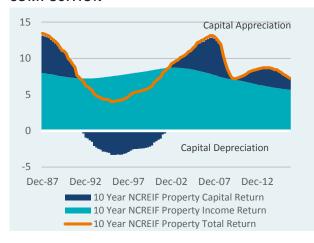
The cap rate is the ratio earnings less expenses to price, and does not include extraordinary expenses.

A more accurate measure of the yield investors receive should include non-recurring capital expenditures; we assume a 2.0% capex expenditure. We also assume income growth will track inflation as inflation is passed through to rents.

Over the last ten years performance between private real estate and REITs is similar. Investors should be careful when comparing riskadjusted returns of publicly traded assets to returns of appraisal priced assets. Private real estate and REITs provide an example of different volatility characteristics of public and private assets.

We assume the effects of leverage and liquidity offset each other, therefore our forecast for private real estate becomes our forecast for REITs.

TRAILING 10YR NCREIF RETURN COMPOSITION



Source: NCREIF, as of 9/30/16

PRIVATE REAL ESTATE

	Private Real Estate 10- Year Forecast
Current Cap Rate	+4.49%
Capex assumption	-2.00%
Income Growth (Inflation)	+2.11%
Nominal Return	4.60%
Inflation	-2.11%
Real Return	2.49%

Source: Verus

REITS

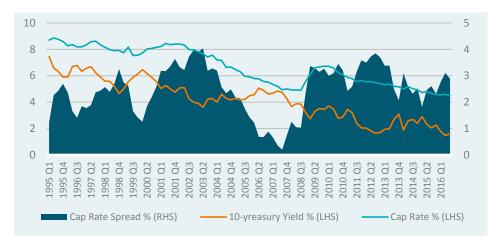
	REITs 10-Year Forecast
Nominal Return Forecast	4.60%
Inflation	-2.11%
Real Return	2.49%



Value-add & opportunistic real estate

Value-add real estate includes properties which are in need of renovation, repositioning, and/or lease-up. Properties may also be classified as value-add due to their lower quality and/or location. Opportunistic real estate can also include development and distressed or very complex transactions. Greater amounts of leverage are usually employed within these strategies. Leverage increases beta (risk) by expanding the purchasing power of property managers via a greater debt load, which magnifies gains or losses. Increased debt also results in greater interest rate sensitivity. An increase/decrease in interest rates may result in a write-up/write-down of fixed rate debt, since debt holdings are typically marked-to-market.

CAP RATE SPREADS



Source: NCREIF, as of 9/30/16

Performance of value-add real estate is composed of the underlying private real estate market returns, plus a premium for additional associated risk, which is modeled here as 200 bps above our core real estate return forecast. Performance of opportunistic real estate strategies rest further out on the risk spectrum, and are modeled as 400 bps above the core real estate return forecast.

Additional expected returns above core real estate are justified by the higher inherent risk of properties which need improvement (operational or physical), price discounts built into properties located in non-core markets, illiquidity, and the ability of real estate managers to potentially source attractive deals in this less-than-efficient marketplace.

Value-Add 10-Year Forecast	Opportunistic 10-Year Forecast
+2.00%	+4.00%
+4.49%	+4.49%
-2.00%	-2.00%
+2.11%	+2.11%
6.60%	8.60%
-2.11%	-2.11%
4.49%	6.49%
	+2.00% +4.49% -2.00% +2.11% 6.60% -2.11%



Commodities

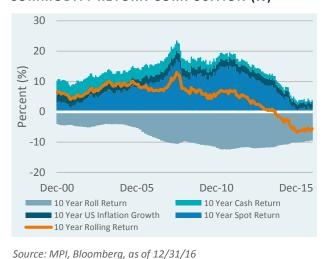
Commodity returns can be decomposed into four sources: collateral return (cash), inflation, spot changes, and roll yield.

Roll return represents either the backwardation or contango present in futures markets. Backwardation occurs when the futures price is below the spot price, which results in an additional profit. Contango occurs when the futures price is above the spot price, and this results in a loss to commodity investors. Historically, futures markets have fluctuated between backwardation and contango but with a zero net effect over the very long-term (since 1877). Therefore, roll return is assumed to be

zero in our forecast. Over the most recent 10-year period, roll return has been negative, though this is likely the result of multiple commodity crises and a difficult market environment.

Our 10-year commodity forecast combines collateral (cash) return with inflation to arrive at the nominal return, and subtracts out inflation to arrive at the real return.

TRAILING 10YR BLOOMBERG COMMODITY RETURN COMPOSITION (%)



BLOOMBERG COMMODITY RETURN COMPOSITION (%)



FORECAST

	10-Year Forecast
Collateral Return (Cash)	+2.15%
Roll Return	+0.00%
Inflation	+2.11%
Nominal Return	4.26%
Inflation	-2.11%
Real Return	2.15%

Source: Verus

NOTE: For more information on how Verus views commodities, please visit our website (www.verusinvestments.com/category/insights/toi/) to read our most recent Topic of Interest paper.

Source: MPI, Bloomberg, as of 12/31/16



Risk parity

Risk parity is built upon the philosophy of allocating to risk premia rather than to asset classes. Because risk parity by definition aims to diversify risk, the actual asset allocation can appear very different from traditional asset class allocation.

We model risk parity using an assumed Sharpe Ratio of 0.5, which considers the historical performance of risk parity. This assumed Sharpe Ratio is higher than other asset class forecasts, but is consistent with these forecasts because *portfolios* of assets tend to deliver materially higher Sharpe Ratios than individual assets.

The expected return of Risk Parity is determined by this Sharpe Ratio forecast, along with a 10% volatility assumption.

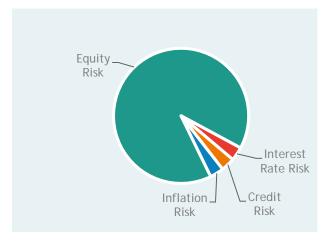
We used a 10-year historical return stream from a market-leading product to represent risk parity correlations relative to the behaviors of each asset class. Risk parity funds are suggested to be better able to withstand various difficult economic environments - reducing volatility without sacrificing return, over longer periods.

It is difficult to arrive at a single model for risk parity, since strategies can differ significantly across firms/strategies. Risk parity almost always requires explicit leverage. The amount of leverage will depend on the specific strategy implementation style, as well as expected correlations and volatility.

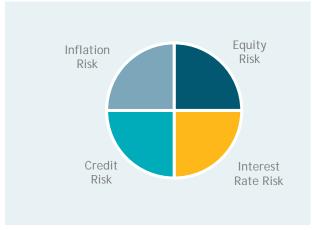
VS. TRADITIONAL ASSET CLASSES



TRADITIONAL ASSET ALLOCATION



RISK PARITY



Source: Verus

Source: MPI, as of 12/31/16
Source: Verus
Note: Risk parity is modeled here using the AQR GRP-EL 10% Volatility fund. Performance is back tested prior to February 2015

· / -77

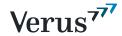
Appendix

Variability of 10-year rolling returns

		Average Yearly Absolute	Average Yearly	Standard Deviation of
CMA Asset Class	Starting Period	Change	Change	Yearly Change
U.S. Large	1981	1.9%	0.0%	2.5%
U.S. Small	1990	2.1%	-0.4%	2.7%
International Developed	1981	2.3%	-0.2%	3.0%
International Developed Small	2011	3.5%	0.7%	4.6%
Emerging Markets	2009	3.2%	-0.9%	3.7%
Global Equity	2009	1.8%	0.7%	2.2%
Private Equity	1997	1.9%	-0.1%	2.2%
U.S. TIPS	2008	0.7%	0.5%	2.4%
U.S. Treasury	2003	0.6%	-0.1%	0.7%
Global Sovereign ex-U.S.	1998	1.1%	-0.3%	1.3%
Core Fixed Income	1986	0.6%	-0.2%	0.8%
Core Plus Fixed Income	1984	0.9%	0.0%	1.1%
Short-Term Gov/Credit	1987	0.4%	-0.3%	0.4%
Long-Term Credit	2001	1.0%	-0.1%	1.3%
High Yield Corp. Credit	1994	1.2%	-0.3%	1.5%
Bank Loans	2007	0.8%	-0.1%	1.3%
Global Credit	2012	0.7%	-0.5%	0.7%
Emerging Markets Debt (Hard)	2005	1.2%	-0.5%	1.5%
Emerging Markets Debt (Local)	2014	2.3%	-2.2%	1.5%
Hedge Fund	2001	0.8%	-0.7%	0.7%
Core Real Estate	1989	0.9%	-0.2%	1.2%
REITs	1989	2.1%	-0.5%	2.7%
Commodities	2002	2.1%	-0.8%	2.3%

Data as of 9/30/16

Note: The period of analysis was determined by the available return history of each respective asset class benchmark.



Autocorrelation adjustment

- In this year's capital market assumptions, we adjusted all volatility forecasts that use the long-term historical volatility for autocorrelation.
- Autocorrelation occurs when the future returns of a time series are described (positively correlated) by past returns.
- Time series with positive autocorrelation exhibit artificially low volatility, while time series with negative autocorrelation exhibit artificially high volatility.
- Many asset classes that we tested showed positive autocorrelation, meaning the volatility forecasts that we use in the forecasting process are too low for those asset classes.
- The result of this process was that several asset classes have higher volatility forecasts than if we
 had made no adjustment for autocorrelation.

Russell 2000 autocorrelation, among many asset classes, is statistically significant

Hedge fund return behavior

Regression using US Treasuries, High Yield, Commodities, and S&P 500	% returns explained by regression	Expected return using this regression	Actual 10yr return	Difference
HFRI Asset Weighted Composite Index	36.07%	2.49%	4.62%	2.13%
HFRI Fund of Funds Composite Index	21.93%	1.87%	1.77%	-0.10%
HFRI ED: Distressed/Restructuring Index	31.13%	3.34%	3.81%	0.47%
HFRI ED: Merger Arbitrage Index	21.15%	1.34%	3.71%	2.37%
HFRI EH: Equity Market Neutral Index	8.74%	0.69%	2.04%	1.36%
HFRI Macro: Systematic Diversified Index	45.90%	0.77%	4.53%	3.76%
HFRI RV: Yield Alternatives Index	57.16%	4.56%	4.47%	-0.08%
HFRI RV: Fixed Income-Convertible Arbitrage Index	50.18%	3.75%	4.73%	0.98%
HFRI Emerging Markets (Total) Index	67.24%	4.73%	3.28%	-1.45%

Public market returns do a poor job of explaining most hedge fund categories

A public market return building blocks approach would result in inappropriately low hedge fund return expectations

Using 10 years of performance data, MPI



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Stanislaus County Employees' Retirement Association

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March 28, 2017

Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

I. SUBJECT: Value Added Private Investments

II. ITEM NUMBER: 8.c

III. ITEM TYPE: Information/Discussion

IV. STAFF RECOMMENDATION: None

V. ANALYSIS: In early 2016, Trustee Riley asked StanCERA staff about a value added report for the private investment asset class. Late last year, staff brought forward an analysis using the current benchmark, a static 9% as a proxy. During that meeting, staff explained the inadequacies using this kind of proxy and informed the Board that we would continue working on this issue.

In consulting with Verus staff, they believe that a true proxy for a value added type calculation does not exist. This agenda item is meant to address those problems inherent with a value added analysis for private investments.

VI. RISK: None

VII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently.

VIII. ADMINISTRATIVE BUDGET IMPACT: None

Rick Santos, Executive Director

Kathy Herman, Fiscal Services Manager

Stanislaus County Employees' Retirement Association

Investment Performance Review

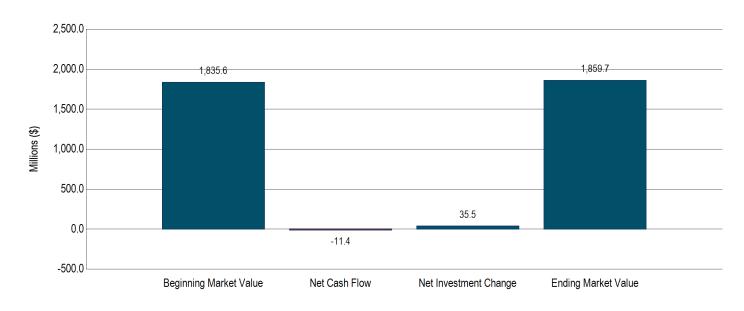
Period Ending: December 31, 2016



Portfolio Reconciliation

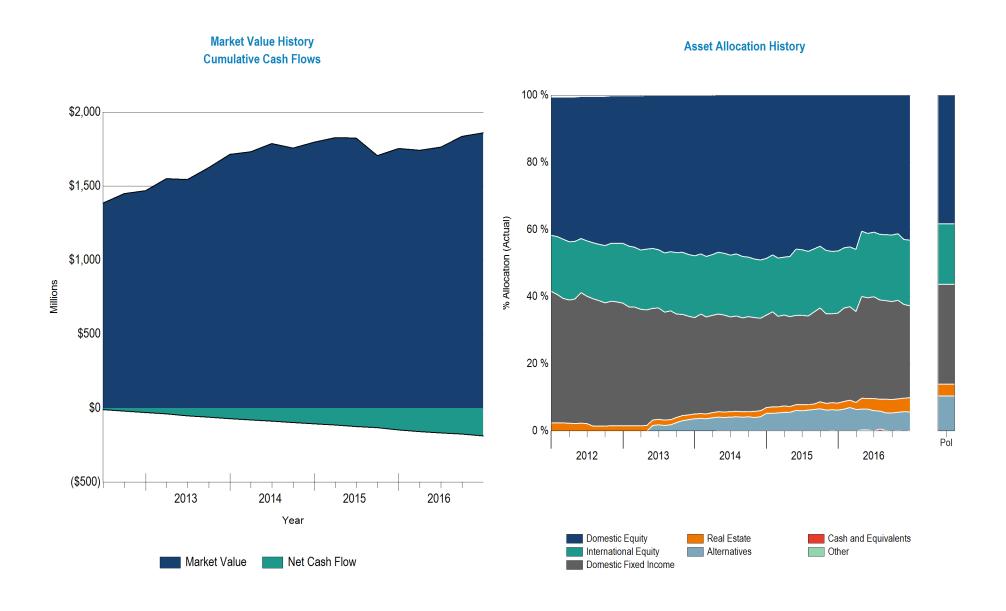
	Last Three Months	Fiscal Year-To-Date	Year-To-Date
Beginning Market Value	\$1,835,627,169	\$1,763,136,187	\$1,754,035,445
Net Cash Flow	-\$11,378,428	-\$18,206,250	-\$36,239,771
Net Investment Change	\$35,494,164	\$114,812,968	\$141,947,231
Ending Market Value	\$1,859,742,905	\$1,859,742,905	\$1,859,742,905

Change in Market Value Last Three Months



Contributions and withdrawals may include intra-account transfers between managers/funds.





Current	Policy
5.0%	4.8%
11.5%	11.3%
16.5%	14.4%
4 = 24	3.7%
4.7%	4.0%
5.4%	18.0%
27.4%	29.8%
	3.5%
4.2%	7.5%
4.9% 0.6% 0.1%	3.0% 0.0%

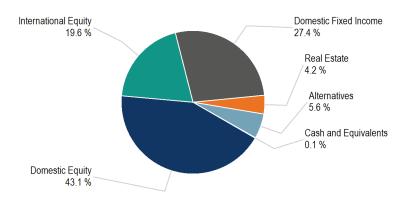
	Current Balance	Current Allocation	Policy	Difference	Policy Range	Within IPS Range?
Domestic Equity Large Cap Core	\$93,182,114	5.0%	4.8%	\$3,914,455	3.8% - 5.8%	Yes
Domestic Equity Large Cap Growth	\$214,681,073	11.5%	11.3%	\$4,530,125	7.8% - 14.8%	Yes
Domestic Equity Large Cap Value	\$306,006,282	16.5%	14.4%	\$38,203,304	11.4% - 17.4%	Yes
Domestic Equity Small Cap Growth	\$87,158,467	4.7%	3.7%	\$18,347,980	2.7% - 4.7%	Yes
Domestic Equity Small Cap Value	\$101,120,078	5.4%	4.0%	\$26,730,361	3.0% - 5.0%	No
International Equity	\$364,071,130	19.6%	18.0%	\$29,317,407	15.0% - 21.0%	Yes
Domestic Fixed Income	\$509,200,188	27.4%	29.8%	-\$45,003,197	26.0% - 33.6%	Yes
Real Estate	\$78,933,928	4.2%	3.5%	\$13,842,926	1.0% - 4.5%	Yes
Direct Lending	\$91,768,734	4.9%	7.5%	-\$47,711,984	2.5% - 9.0%	Yes
Infrastructure	\$11,498,788	0.6%	3.0%	-\$44,293,499	0.0% - 4.0%	Yes
Cash and Equivalents	\$2,122,122	0.1%	0.0%	\$2,122,122	0.0% - 2.0%	Yes
Total	\$1,859,742,905	100.0%	100.0%			

Cash Account includes cash held at Northern Trust for all closed end funds.



	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Fund	1.9	6.5	8.2	4.9	9.6	5.7
Policy Index	1.0	4.2	8.2	5.3	8.6	5.7
InvestorForce Public DB Gross Rank	5	3	31	33	12	23
US Equity	5.2	12.0	12.4	7.6	15.1	6.7
US Equity Blended	4.9	10.1	13.9	8.3	14.8	7.4
Russell 3000	4.2	8.8	12.7	8.4	14.7	7.1
InvestorForce All DB US Eq Gross Rank	25	11	58	59	15	71
International Equity	0.2	7.6	5.7	-0.8	6.7	2.0
MSCI ACWI ex USA Gross	-1.2	5.7	5.0	-1.3	5.5	1.4
InvestorForce All DB ex-US Eq Gross Rank	10	15	24	46	44	31
US Fixed Income	-1.4	0.1	5.4	3.9	4.0	5.6
BBgBarc US Aggregate TR	-3.0	-2.5	2.6	3.0	2.2	4.3
InvestorForce All DB US Fix Inc Gross Rank	26	25	47	38	40	39
Real Estate	0.4	0.8	7.5	15.7	10.6	
DJ US Select RESI	-2.5	-3.7	6.6	13.7	11.6	
Direct Lending	2.3	2.3	3.9	7.4		
9% Annual	2.2	2.2	6.7	8.2		
Infrastructure	4.1	4.1	12.8			
CPI + 5%	1.2	1.2	5.7			

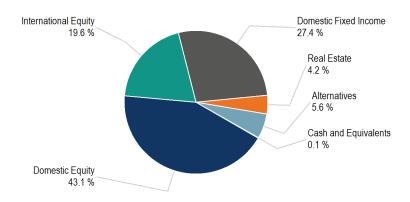
Current Allocation



Policy Index: 14.4% Russell 1000 Value, 11.3% Russell 1000 Growth, 4.8% S&P 500, 4.0% Russell 2000 Value, 3.7% Russell 2000 Growth, 18.0% MSCI ACWI ex USA, 29.8% BBgBarc US Aggregate, 3.5% DJ US Select RESI, 7.5% 9% Annual, 3% CPI + 4%. US Equity Blended: 80% Russell 1000, 20% Russell 2000.

	QTD	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Fund	1.8	6.3	7.7	4.5	9.2	5.3
Policy Index	1.0	4.2	8.2	5.3	8.6	5.7
US Equity	5.1	11.8	12.1	7.3	14.8	6.4
US Equity Blended	4.9	10.1	13.9	8.3	14.8	7.4
Russell 3000	4.2	8.8	12.7	8.4	14.7	7.1
International Equity	0.1	7.3	5.0	-1.3	6.2	1.5
MSCI ACWI ex USA Gross	-1.2	5.7	5.0	-1.3	5.5	1.4
US Fixed Income	-1.5	0.0	5.2	3.8	3.8	5.4
BBgBarc US Aggregate TR	-3.0	-2.5	2.6	3.0	2.2	4.3
Real Estate	0.1	0.5	6.6	14.5	9.3	
DJ US Select RESI	-2.5	-3.7	6.6	13.7	11.6	
Direct Lending	1.6	1.6	1.9	5.3		
9% Annual	2.2	2.2	6.7	8.2		
Infrastructure	-0.5	-0.5	4.1			
CPI + 5%	1.2	1.2	5.7			

Current Allocation

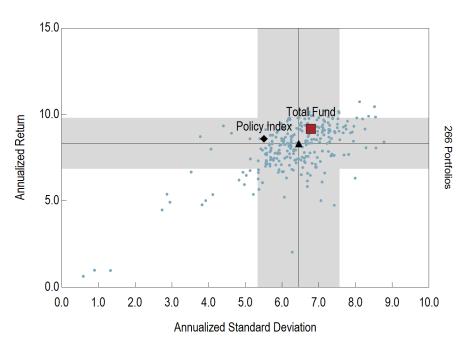


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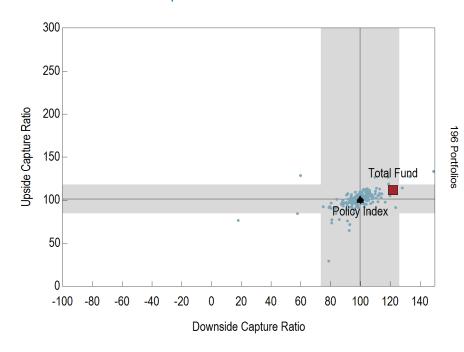
	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
Total Fund	9.16%	0.57%	6.78%	-1.17%	1.20	1.83%	0.95	1.34	0.31	111.64%	121.94%

Risk vs. Return



- Total Fund
- Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

Up Markets vs. Down Markets



- Total Fund
- Policy Index
- Universe Median
- 68% Confidence Interval
- InvestorForce Public DB Gross

	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2016	2015	2014	2013	2012
Total Fund	1,859,742,905	100.0	1.9	6.5	8.2	4.9	9.6	5.7	8.2	-0.3	6.9	19.8	14.3
Policy Index			1.0	4.2	8.2	5.3	8.6	5.7	8.2	0.2	7.5	15.4	12.3
InvestorForce Public DB Gross Rank			5	3	31	33	12	23	31	61	23	12	10
US Equity	802,148,015	43.1	5.2	12.0	12.4	7.6	15.1	6.7	12.4	-0.2	10.9	36.9	18.8
US Equity Blended			4.9	10.1	13.9	8.3	14.8	7.4	13.9	-0.1	11.6	34.3	16.7
Russell 3000			4.2	8.8	12.7	8.4	14.7	7.1	12.7	0.5	12.6	33.6	16.4
InvestorForce All DB US Eq Gross Rank			25	11	58	59	15	71	58	63	54	13	6
Mellon S&P 500	93,182,114	5.0	3.8	7.8	12.0	8.9	14.7	7.0	12.0	1.4	13.7	32.4	16.0
S&P 500			3.8	7.8	12.0	8.9	14.7	6.9	12.0	1.4	13.7	32.4	16.0
eA US Large Cap Core Equity Gross Rank			49	48	31	32	35	68	31	41	42	58	40
BlackRock Russell 1000 Growth	90,073,255	4.8	1.0	5.7	7.2	8.6	14.6		7.2	5.7	13.1	33.5	15.4
Russell 1000 Growth			1.0	5.6	7.1	8.6	14.5		7.1	5.7	13.0	33.5	15.3
eA US Large Cap Growth Equity Gross Rank			39	47	26	24	35		26	42	37	56	53
Jackson Square	124,607,818	6.7	-4.0	3.1	-4.4	4.8	12.8	7.9	-4.4	5.9	13.8	35.6	17.0
Russell 1000 Growth			1.0	5.6	7.1	8.6	14.5	8.3	7.1	5.7	13.0	33.5	15.3
eA US Large Cap Growth Equity Gross Rank			96	81	98	89	78	58	98	39	32	39	36
BlackRock Russell 1000 Value	112,129,891	6.0	6.6	10.4	17.3	8.7	14.9		17.3	-3.6	13.5	32.6	17.6
Russell 1000 Value			6.7	10.4	17.3	8.6	14.8		17.3	-3.8	13.5	32.5	17.5
eA US Large Cap Value Equity Gross Rank			46	51	26	33	36		26	62	31	59	30
Dodge & Cox-Equity	193,876,391	10.4	10.5	20.1	21.4	9.0	17.1	6.6	21.4	-3.9	10.9	39.1	22.3
Russell 1000 Value			6.7	10.4	17.3	8.6	14.8	5.7	17.3	-3.8	13.5	32.5	17.5
eA US Large Cap Value Equity Gross Rank			6	4	6	25	5	56	6	64	72	15	3
Legato Capital	87,158,467	4.7	4.2	11.4	6.4	2.9	13.6		6.4	-0.7	3.0	47.3	18.1
Russell 2000 Growth			3.6	13.1	11.3	5.1	13.7		11.3	-1.4	5.6	43.3	14.6
eA US Small Cap Growth Equity Gross Rank			33	54	79	72	55		79	52	57	41	24
Capital Prospects	101,120,078	5.4	13.0	22.2	28.1	8.0	16.6		28.1	-7.0	5.8	37.9	23.8
Russell 2000 Value			14.1	24.2	31.7	8.3	15.1		31.7	-7.5	4.2	34.5	18.1
eA US Small Cap Value Equity Gross Rank			45	38	40	60	38		40	72	51	53	9

Individual closed end funds are not shown in performance summary table.



	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2016	2015	2014	2013	2012
International Equity	364,071,130	19.6	0.2	7.6	5.7	-0.8	6.7	2.0	5.7	-3.7	-4.2	20.0	18.0
MSCI ACWI ex USA Gross			-1.2	5.7	5.0	-1.3	5.5	1.4	5.0	-5.3	-3.4	15.8	17.4
InvestorForce All DB ex-US Eq Gross Rank			10	15	24	46	44	31	24	51	70	35	63
LSV Asset Mgt	184,601,275	9.9	2.5	11.6	8.8	-0.3	6.9	1.9	8.8	-5.1	-4.0	20.4	16.7
MSCI ACWI ex USA Gross			-1.2	5.7	5.0	-1.3	5.5	1.4	5.0	-5.3	-3.4	15.8	17.4
eA ACWI ex-US Equity Unhedged Gross Rank			6	4	10	48	62	75	10	86	65	46	78
Fidelity	179,469,855	9.7	-2.0	3.7	2.4	-1.4	6.5	2.2	2.4	-2.0	-4.5	19.6	19.3
MSCI ACWI ex USA Gross			-1.2	5.7	5.0	-1.3	5.5	1.4	5.0	-5.3	-3.4	15.8	17.4
eA ACWI ex-US Equity Unhedged Gross Rank			40	52	46	69	67	68	46	66	70	55	55
US Fixed Income	509,200,188	27.4	-1.4	0.1	5.4	3.9	4.0	5.6	5.4	0.3	6.2	0.3	7.9
BBgBarc US Aggregate TR			-3.0	-2.5	2.6	3.0	2.2	4.3	2.6	0.6	6.0	-2.0	4.2
InvestorForce All DB US Fix Inc Gross Rank			26	25	47	38	40	39	47	42	42	21	48
Dodge & Cox-Fixed	394,782,448	21.2	-1.2	0.5	5.9	4.1	4.3	5.7	5.9	0.2	6.5	0.9	8.4
BBgBarc US Aggregate TR			-3.0	-2.5	2.6	3.0	2.2	4.3	2.6	0.6	6.0	-2.0	4.2
eA US Core Fixed Inc Gross Rank			3	2	3	8	5	8	3	89	26	3	9
PIMCO	114,417,741	6.2	-2.3	-1.4	3.7	3.2	2.6		3.7	0.9	5.0	-2.2	5.8
BBgBarc US Aggregate TR			-3.0	-2.5	2.6	3.0	2.2		2.6	0.6	6.0	-2.0	4.2
eA US Core Fixed Inc Gross Rank			14	15	29	71	71		29	49	83	89	54
Real Estate	78,933,928	4.2	0.4	0.8	7.5	15.7	10.6		7.5	12.1	28.3	1.4	5.6
DJ US Select RESI			-2.5	-3.7	6.6	13.7	11.6		6.6	4.5	31.9	1.3	16.1
Prime Property Fund	16,890,251	0.9	2.6	5.2	10.4				10.4				
NCREIF-ODCE			2.1	4.2	8.8				8.8				
American Strategic Value Realty	18,851,824	1.0	3.4	5.7	13.1				13.1	21.4		-	
NCREIF Property Index			1.7	3.5	8.0				8.0	13.3			
BlackRock US Real Estate	30,015,945	1.6	-2.5	-3.7	6.6	13.7	-		6.6	4.4	31.9	1.4	
DJ US Select RESI TR USD			-2.5	-3.7	6.6	13.7			6.6	4.5	31.9	1.3	
eA US REIT Gross Rank			44	56	68	55			68	58	39	91	

Individual closed end funds are not shown in performance summary table.



	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2016	2015	2014	2013	2012	Return	Since
Total Fund	1,859,742,905	100.0	1.8	6.3	7.7	4.5	9.2	5.3	7.7	-0.6	6.5	19.2	14.0	9.0	Dec-94
Policy Index			1.0	4.2	8.2	5.3	8.6	5.7	8.2	0.2	7.5	15.4	12.3	8.0	Dec-94
US Equity	802,148,015	43.1	5.1	11.8	12.1	7.3	14.8	6.4	12.1	-0.4	10.7	36.5	18.5	6.5	Jun-01
US Equity Blended			4.9	10.1	13.9	8.3	14.8	7.4	13.9	-0.1	11.6	34.3	16.7	6.7	Jun-01
Russell 3000			4.2	8.8	12.7	8.4	14.7	7.1	12.7	0.5	12.6	33.6	16.4	6.5	Jun-01
Mellon S&P 500	93,182,114	5.0	3.8	7.8	11.9	8.9	14.7	6.9	11.9	1.4	13.7	32.4	16.0	9.0	Apr-03
S&P 500			3.8	7.8	12.0	8.9	14.7	6.9	12.0	1.4	13.7	32.4	16.0	9.0	Apr-03
BlackRock Russell 1000 Growth	90,073,255	4.8	1.0	5.7	7.2	8.6	14.5		7.2	5.7	13.1	33.5	15.4	15.6	Jun-10
Russell 1000 Growth			1.0	5.6	7.1	8.6	14.5		7.1	5.7	13.0	33.5	15.3	15.5	Jun-10
Jackson Square	124,607,818	6.7	-4.2	2.8	-4.9	4.4	12.4	7.4	-4.9	5.5	13.4	34.9	16.6	7.9	Aug-06
Russell 1000 Growth			1.0	5.6	7.1	8.6	14.5	8.3	7.1	5.7	13.0	33.5	15.3	8.9	Aug-06
BlackRock Russell 1000 Value	112,129,891	6.0	6.6	10.4	17.3	8.6	14.9		17.3	-3.6	13.5	32.6	17.6	14.1	Jul-09
Russell 1000 Value			6.7	10.4	17.3	8.6	14.8		17.3	-3.8	13.5	32.5	17.5	13.9	Jul-09
Dodge & Cox-Equity	193,876,391	10.4	10.4	20.0	21.2	8.8	16.9	6.4	21.2	-4.0	10.7	38.8	22.1	12.2	Dec-94
Russell 1000 Value			6.7	10.4	17.3	8.6	14.8	5.7	17.3	-3.8	13.5	32.5	17.5	10.1	Dec-94
Legato Capital	87,158,467	4.7	3.8	10.6	4.8	1.8	12.6		4.8	-1.8	2.5	46.0	17.4	14.8	Dec-08
Russell 2000 Growth			3.6	13.1	11.3	5.1	13.7		11.3	-1.4	5.6	43.3	14.6	15.7	Dec-08
Capital Prospects	101,120,078	5.4	12.6	21.3	26.2	6.9	15.6		26.2	-7.9	5.2	36.8	23.2	15.7	Dec-08
Russell 2000 Value			14.1	24.2	31.7	8.3	15.1		31.7	-7.5	4.2	34.5	18.1	14.0	Dec-08
International Equity	364,071,130	19.6	0.1	7.3	5.0	-1.3	6.2	1.5	5.0	-4.0	-4.5	19.4	17.5	4.9	Jun-01
MSCI ACWI ex USA Gross			-1.2	5.7	5.0	-1.3	5.5	1.4	5.0	-5.3	-3.4	15.8	17.4	5.6	Jun-01
LSV Asset Mgt	184,601,275	9.9	2.3	11.3	8.2	-0.7	6.4	1.4	8.2	-5.4	-4.2	19.8	16.2	6.0	Aug-04
MSCI ACWI ex USA Gross			-1.2	5.7	5.0	-1.3	5.5	1.4	5.0	-5.3	-3.4	15.8	17.4	6.0	Aug-04
Fidelity	179,469,855	9.7	-2.1	3.5	1.8	-1.8	6.0	1.7	1.8	-2.3	-4.9	19.1	18.8	2.4	Apr-06
MSCI ACWI ex USA Gross			-1.2	5.7	5.0	-1.3	5.5	1.4	5.0	-5.3	-3.4	15.8	17.4	2.3	Apr-06
US Fixed Income	509,200,188	27.4	-1.5	0.0	5.2	3.8	3.8	5.4	5.2	0.2	6.1	0.1	7.7	5.7	Jun-01
BBgBarc US Aggregate TR			-3.0	-2.5	2.6	3.0	2.2	4.3	2.6	0.6	6.0	-2.0	4.2	4.7	Jun-01
Dodge & Cox-Fixed	394,782,448	21.2	-1.2	0.4	5.7	4.1	4.2	5.6	5.7	0.1	6.4	0.8	8.3	6.8	Dec-94
BBgBarc US Aggregate TR			-3.0	-2.5	2.6	3.0	2.2	4.3	2.6	0.6	6.0	-2.0	4.2	5.8	Dec-94
PIMCO	114,417,741	6.2	-2.4	-1.6	3.4	2.9	2.3		3.4	0.6	4.7	-2.5	5.5	3.5	May-10
BBgBarc US Aggregate TR			-3.0	-2.5	2.6	3.0	2.2		2.6	0.6	6.0	-2.0	4.2	3.3	May-10

Individual closed end funds are not shown in performance summary table.



	Market Value	% of Portfolio	3 Mo	Fiscal YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs	2016	2015	2014	2013	2012	Return	Since
Real Estate	78,933,928	4.2	0.1	0.5	6.6	14.5	9.3		6.6	10.5	27.4	1.3	2.7	2.8	Feb-08
DJ US Select RESI			-2.5	-3.7	6.6	13.7	11.6		6.6	4.5	31.9	1.3	16.1	5.5	Feb-08
Prime Property Fund	16,890,251	0.9	2.4	4.7	9.2				9.2					10.0	Sep-15
NCREIF-ODCE			2.1	4.2	8.8				8.8					9.8	Sep-15
American Strategic Value Realty	18,851,824	1.0	3.0	5.3	11.7				11.7	18.3				15.0	Dec-14
NCREIF Property Index			1.7	3.5	8.0				8.0	13.3				10.6	Dec-14
BlackRock US Real Estate	30,015,945	1.6	-2.6	-3.8	6.6	13.6			6.6	4.4	31.9	1.3		10.4	Sep-12
DJ US Select RESI TR USD			-2.5	-3.7	6.6	13.7			6.6	4.5	31.9	1.3		10.4	Sep-12

			Verus Internal Analysis										
Inception Manager Date Name/Fund Name	Estimated Market Value as of 12/31/16 ³	Total Commitment	Capital Called	% Called	Remaining Commitment	Total Distributions	Distrib <i>.l</i> Paid-In (DPI) ¹	Tot. Value/ Paid-In (TVPI) ²	Latest Valuation				
Real Estate 07/31/2014 Greenfield Gap	\$13,175,908	\$15,000,000	\$11,021,141	73%	\$3,978,859	\$0	0.0%	119.6%	09/30/2016				
Total Real Estat	te \$13,175,908	\$15,000,000	\$11,021,141	73%	\$3,978,859	\$0	0.0%	119.6%					
% of Portfolio (Market Value	9 0.7%												
Direct Lending													
05/31/2013 Medley Capital	\$23,924,172	\$30,000,000	\$29,000,453	97%	\$999,547	\$14,682,600	50.6%	133.1%	09/30/2016				
05/31/2013 Raven Capital	\$18,728,840	\$40,000,000	\$34,505,763	86%	\$5,494,237	\$18,418,764	53.4%	107.7%	09/30/2016				
07/31/2015 Raven Opportunity III	\$13,062,471	\$50,000,000	\$13,662,438	27%	\$36,337,562	\$5,182,527	37.9%	133.5%	09/30/2016				
08/31/2013 White Oak Pinnacle	\$36,053,251	\$40,000,000	\$40,000,000 4	100%	\$4,494,049	\$15,727,174	39.3%	129.5%	09/30/2016				
Total Direct Lendin	g \$91,768,734	\$160,000,000	\$117,168,654	73%	\$47,325,395	\$54,011,065	46.1%	124.4%					
% of Portfolio (Market Value	4.9%												
Infrastructure													
05/31/2015 MS Infrastructure Partners II	\$11,498,788	\$50,000,000	\$12,274,625	25%	\$37,725,375	\$1,295,430	10.6%	104.2%	09/30/2016				
Total Infrastructure	\$11,498,788	\$50,000,000	\$12,274,625	25%	\$37,725,375	\$1,295,430	10.6%	104.2%					
% of Portfolio (Market Value)	0.6%												

⁴ Includes deemed contributions, which are amounts withheld from distributions and applied to fulfill capital calls.



^{1 (}DPI) is equal to (capital returned / capital called)

^{2 (}TVPI) is equal to (market value + capital returned) / capital called

³ Last known market value + capital calls - distributions

Real Estate	Inception	Fund Level (G)	StanCERA (G)	Fund Level (N)	StanCERA (N)	IRR Date
Greenfield Gap	07/31/2014	17.6%	19.8%	14.0%	13.6%	09/30/2016
Direct Lending						
Medley Capital	05/31/2013	8.7%	7.0%	6.8%	5.0%	09/30/2016
Raven Capital	05/31/2013	7.2%	7.2%	3.5%	3.5%	09/30/2016
Raven Opportunity III	07/31/2015	13.7%	13.7%	-5.4%	-5.4%	09/30/2016
White Oak Pinnacle	08/31/2013	14.5%	15.2%	9.0%	9.4%	09/30/2016
Infrastructure						
MS Infrastructure Partners II	05/31/2015	10.4%	9.6%	-2.6%	-6.5%	09/30/2016

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	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
Mellon S&P 500	8.87%	0.00%	6.80%	0.00%	1.00	0.03%	1.00	1.29	-0.12	99.91%	99.75%
BlackRock Russell 1000 Growth	8.60%	0.05%	6.56%	0.04%	1.00	0.05%	1.00	1.29	0.94	100.52%	100.07%
Jackson Square	4.41%	-4.14%	10.62%	-7.77%	1.42	5.79%	0.77	0.40	-0.72	64.60%	136.05%
BlackRock Russell 1000 Value	8.64%	0.05%	8.21%	0.10%	0.99	0.07%	1.00	1.04	0.75	100.09%	98.83%
Dodge & Cox-Equity	8.81%	0.23%	10.11%	-0.30%	1.06	5.08%	0.75	0.86	0.05	104.86%	107.58%
Legato Capital	1.81%	-3.24%	13.23%	-3.10%	0.97	3.02%	0.95	0.13	-1.07	80.32%	109.39%
Capital Prospects	6.94%	-1.37%	12.51%	-0.39%	0.88	2.66%	0.97	0.54	-0.52	84.32%	91.25%
LSV Asset Mgt	-0.67%	0.65%	11.61%	0.78%	1.10	2.82%	0.95	-0.07	0.23	114.37%	102.19%
Fidelity	-1.84%	-0.51%	9.43%	-0.66%	0.89	2.58%	0.94	-0.21	-0.20	84.81%	95.46%
Dodge & Cox-Fixed	4.05%	1.02%	2.86%	1.95%	0.69	1.84%	0.73	1.37	0.55	97.89%	39.36%
PIMCO	2.90%	-0.13%	3.04%	0.32%	0.85	0.71%	0.97	0.91	-0.18	87.99%	77.07%
BlackRock US Real Estate	13.60%	-0.07%	13.49%	-0.06%	1.00	0.05%	1.00	1.00	-1.40	99.66%	100.24%

5 Years

	Anlzd Ret	Ann Excess BM Return	Anlzd Std Dev	Anlzd Alpha	Beta	Tracking Error	R-Squared	Sharpe Ratio	Info Ratio	Up Mkt Cap Ratio	Down Mkt Cap Ratio
Mellon S&P 500	14.65%	-0.01%	9.11%	0.01%	1.00	0.02%	1.00	1.60	-0.36	99.86%	99.65%
BlackRock Russell 1000 Growth	14.55%	0.05%	9.84%	0.05%	1.00	0.05%	1.00	1.47	1.01	100.32%	99.67%
Jackson Square	12.36%	-2.14%	12.86%	-5.53%	1.23	4.83%	0.89	0.95	-0.44	87.59%	121.12%
BlackRock Russell 1000 Value	14.85%	0.05%	9.52%	0.08%	1.00	0.06%	1.00	1.55	0.91	100.21%	99.04%
Dodge & Cox-Equity	16.90%	2.10%	11.07%	0.99%	1.07	4.23%	0.86	1.52	0.50	119.26%	108.39%
Legato Capital	12.57%	-1.17%	14.05%	-1.15%	1.00	2.91%	0.96	0.89	-0.40	92.17%	100.83%
Capital Prospects	15.56%	0.49%	12.68%	1.11%	0.96	3.01%	0.95	1.22	0.16	100.85%	94.21%
LSV Asset Mgt	6.39%	0.91%	12.91%	0.50%	1.07	2.39%	0.97	0.49	0.38	113.09%	103.68%
Fidelity	6.00%	0.51%	11.38%	0.83%	0.94	2.34%	0.96	0.52	0.22	97.44%	91.11%
Dodge & Cox-Fixed	4.23%	2.00%	2.79%	2.64%	0.71	1.88%	0.65	1.48	1.06	122.96%	27.38%
PIMCO	2.31%	0.08%	3.09%	0.19%	0.95	0.72%	0.95	0.72	0.11	98.10%	91.33%

Performance Analysis excludes closed end funds and those funds without 3 and 5 years of performance.



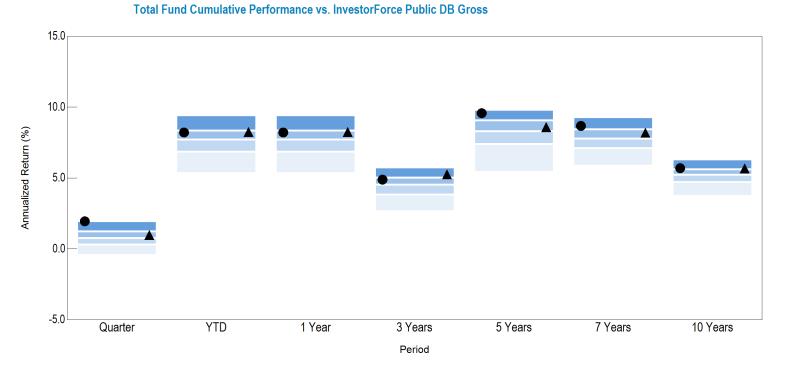
Total Fund Investment Fund Fee Analysis

Period Ending: December 31, 2016

Name	Asset Class	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Mellon S&P 500	Domestic Equity	0.04% of Assets	\$93,182,114	\$32,614	0.04%
BlackRock Russell 1000 Growth	Domestic Equity	0.02% of Assets	\$90,073,255	\$18,015	0.02%
Jackson Square	Domestic Equity	0.50% of First \$100.0 Mil, 0.45% Thereafter	\$124,607,818	\$610,735	0.49%
BlackRock Russell 1000 Value	Domestic Equity	0.02% of Assets	\$112,129,891	\$22,426	0.02%
Dodge & Cox-Equity	Domestic Equity	0.40% of First \$10.0 Mil, 0.20% of Next \$90.0 Mil, 0.15% Thereafter	\$193,876,391	\$360,815	0.19%
Legato Capital		0.77% of Assets	\$87,158,467	\$671,120	0.77%
Capital Prospects		0.75% of Assets	\$101,120,078	\$758,401	0.75%
LSV Asset Mgt	International Equity	0.75% of First \$25.0 Mil, 0.65% of Next \$25.0 Mil, 0.55% of Next \$50.0 Mil, 0.45% Thereafter	\$184,601,275	\$1,005,706	0.54%
Fidelity	International Equity	0.25% of Assets	\$179,469,855	\$448,675	0.25%
Dodge & Cox-Fixed	Domestic Fixed Income	0.40% of First \$4.0 Mil, 0.30% of Next \$6.0 Mil, 0.20% of Next \$10.0 Mil, 0.10% Thereafter	\$394,782,448	\$428,782	0.11%
PIMCO	Domestic Fixed Income	0.50% of First \$25.0 Mil, 0.38% of Next \$25.0 Mil, 0.25% Thereafter	\$114,417,741	\$379,794	0.33%
Prime Property Fund	Real Estate	0.84% of Assets	\$16,890,251	\$141,878	0.84%
American Strategic Value Realty	Real Estate	1.25% of First \$10.0 Mil, 1.20% of Next \$15.0 Mil, 1.10% of Next \$25.0 Mil, 1.00% Thereafter	\$18,851,824	\$231,222	1.23%
BlackRock US Real Estate	Real Estate	0.09% of First \$100.0 Mil, 0.07% Thereafter	\$30,015,945	\$27,014	0.09%
Cash Account	Cash and Equivalents	0.10% of Assets	\$2,122,122	\$2,122	0.10%
Total			\$1,743,299,475	\$5,139,319	0.29%

Closed end funds excluded from fee analysis. Fidelity has performance based fees which are not included in the analysis above; fee shown is the annual base fee only.



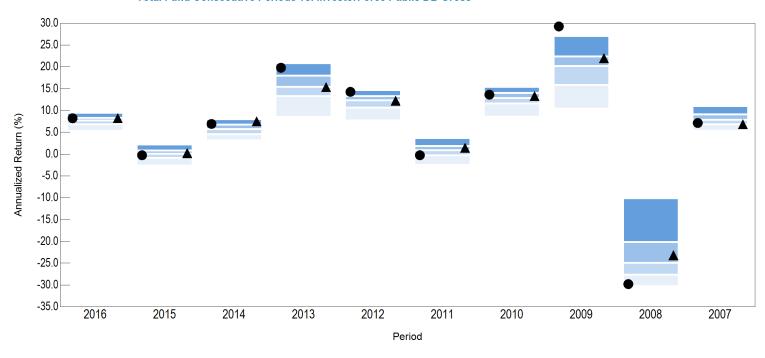


5th Percentile
25th Percentile
Median
75th Percentile
95th Percentile
of Portfolios

Total FundPolicy Index

Return (Ran	ık)												
1.9		9.4		9.4		5.7		9.8		9.3		6.3	
1.2		8.4		8.4		5.0		9.1		8.5		5.6	
8.0		7.7		7.7		4.5		8.3		7.8		5.2	
0.3		6.9		6.9		3.8		7.4		7.1		4.7	
-0.4		5.3		5.3		2.7		5.4		5.9		3.8	
311		305		305		284		266		236		216	
1.9	(5)	8.2	(31)	8.2	(31)	4.9	(33)	9.6	(12)	8.7	(16)	5.7	(23)
1.0	(38)	8.2	(29)	8.2	(29)	5.3	(18)	8.6	(40)	8.2	(35)	5.7	(24)

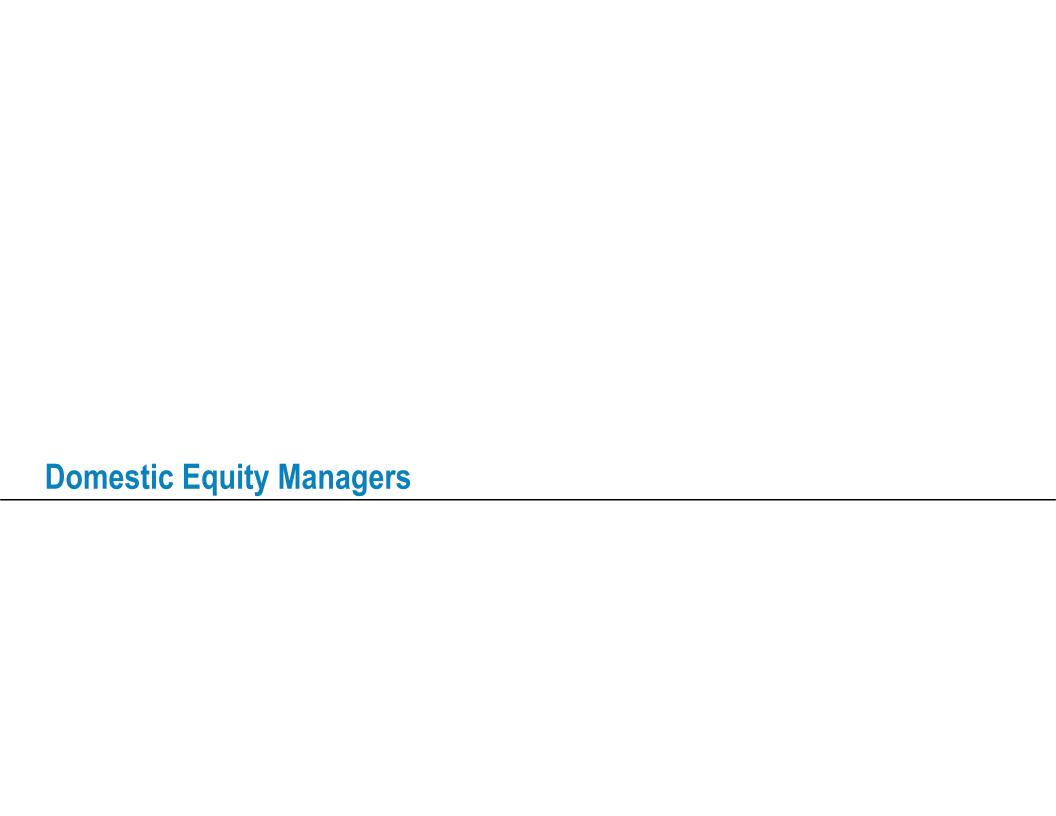
Total Fund Consecutive Periods vs. InvestorForce Public DB Gross



5th Percentile
25th Percentile
Median
75th Percentile
95th Percentile
of Portfolios

Total FundPolicy Index

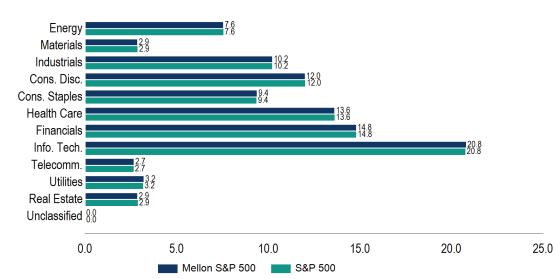
Return	(Rank)																			
9.4		2.2		8.0		20.8		14.6		3.6		15.4		27.0		-10.1		11.0		
8.4		0.9		6.8		18.0		13.4		1.9		14.0		22.4		-20.1		9.1		
7.7		0.1		5.8		15.5		12.4		0.9		12.9		20.2		-24.9		7.9		
6.9		-0.9		4.6		13.3		10.7		-0.3		11.7		15.9		-27.6		6.9		
5.3		-2.6		3.2		8.5		7.8		-2.5		8.6		10.5		-30.3		5.4		
305		316		248		231		236		206		188		184		181		177		
8.2 8.2	(31) (29)	-0.3 0.2	(61) (46)	6.9 7.5	(23) (12)	19.8 15.4	(12) (52)	14.3 12.3	(10) (53)	-0.3 1.4	(75) (35)	13.6 13.3	(35) (42)	29.3 22.0	(1) (29)	-29.8 -23.2	(92) (37)	7.1 6.9	(68) (76)	
0.2	(20)	0.2	(40)	7.0	(12)	10.7	(02)	12.0	(00)	1.4	(00)	10.0	(-4)	22.0	(20)	20.2	(01)	0.5	(10)	



Characteristics

	Portfolio	S&P 500
Number of Holdings	500	505
Weighted Avg. Market Cap. (\$B)	139.12	138.54
Median Market Cap. (\$B)	18.81	18.83
Price To Earnings	23.10	22.27
Price To Book	4.67	4.38
Price To Sales	3.51	3.34
Return on Equity (%)	20.83	18.52
Yield (%)	2.10	2.10
Beta	1.00	1.00

Sector Allocation (%) vs S&P 500



Largest Holdings

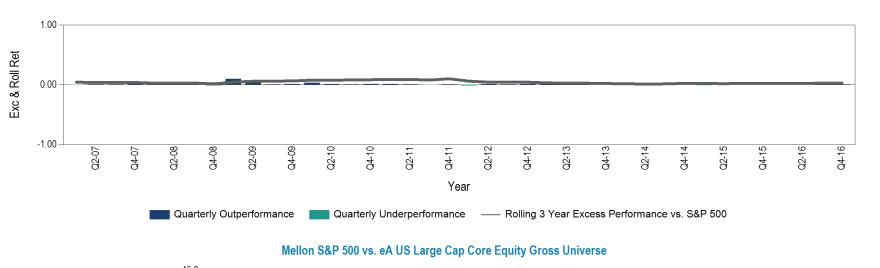
Top Contributors

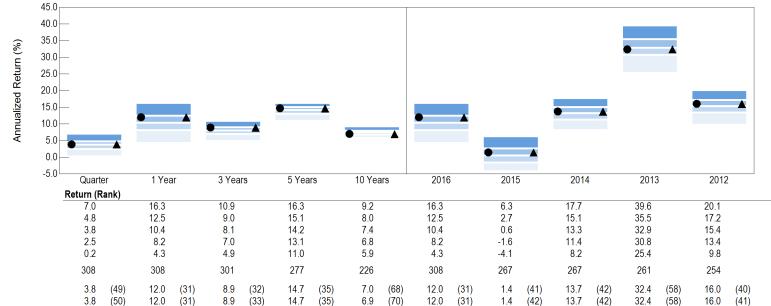
Bottom Contributors

3.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5												
	End Weight	Return		Avg Wgt	Return	Contribution	n	Avg Wgt	Return	Contribution		
APPLE	3.21	2.98	JP MORGAN CHASE &	1.39	30.52	0.42	AMAZON.COM	1.67	-10.44	-0.17		
MICROSOFT	2.51	8.60	CO.	1.00	30.32	0.42	FACEBOOK CLASS A	1.57	-10.31	-0.16		
ALPHABET 'C'	2.41	-0.70	BANK OF AMERICA	0.97	41.72	0.40	MEDTRONIC	0.60	-17.06	-0.10		
EXXON MOBIL	1.94	4.32	WELLS FARGO & CO	1.16	25.50	0.30	AMGEN	0.60	-11.75	-0.07		
JOHNSON & JOHNSON	1.63	-1.80	MICROSOFT	2.47	8.60	0.21	PROCTER & GAMBLE	1.24	-5.58	-0.07		
BERKSHIRE HATHAWAY 'B'	1.61	12.81	CITIGROUP	0.79	26.25	0.21	CVS HEALTH	0.48	-10.90	-0.05		
JP MORGAN CHASE & CO.	1.60	30.52	BERKSHIRE HATHAWAY	1.51	12.81	0.19	GILEAD SCIENCES	0.53	-8.92	-0.05		
AMAZON.COM	1.53	-10.44	'B'				VISA 'A'	0.82	-5.46	-0.04		
GENERAL ELECTRIC	1.45	7.49	GOLDMAN SACHS GP.	0.38	48.93	0.18	MERCK & COMPANY	0.90	-4.95	-0.04		
FACEBOOK CLASS A	1.40	-10.31	CHEVRON	1.07	15.50	0.17	SIMON PROPERTY		-13.41			
THOUSEN GENOOM			0		NVIDIA	0.22 56.01 0.13		GROUP	(132)		-0.04	
			UNITEDHEALTH GROUP	0.74	14.77	0.11						

Unclassified sector allocation includes cash allocations.





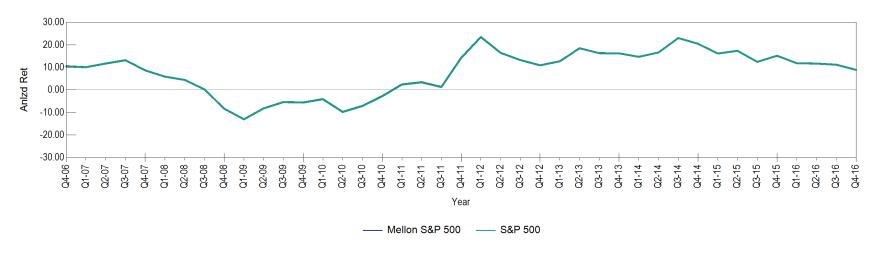


5th Percentile 25th Percentile Median 75th Percentile 95th Percentile # of Portfolios Mellon S&P 500

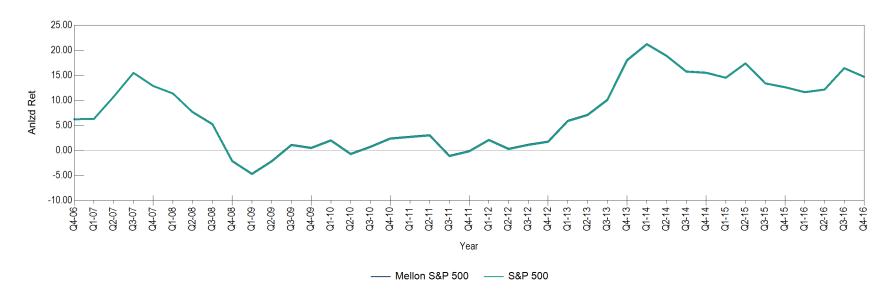
S&P 500

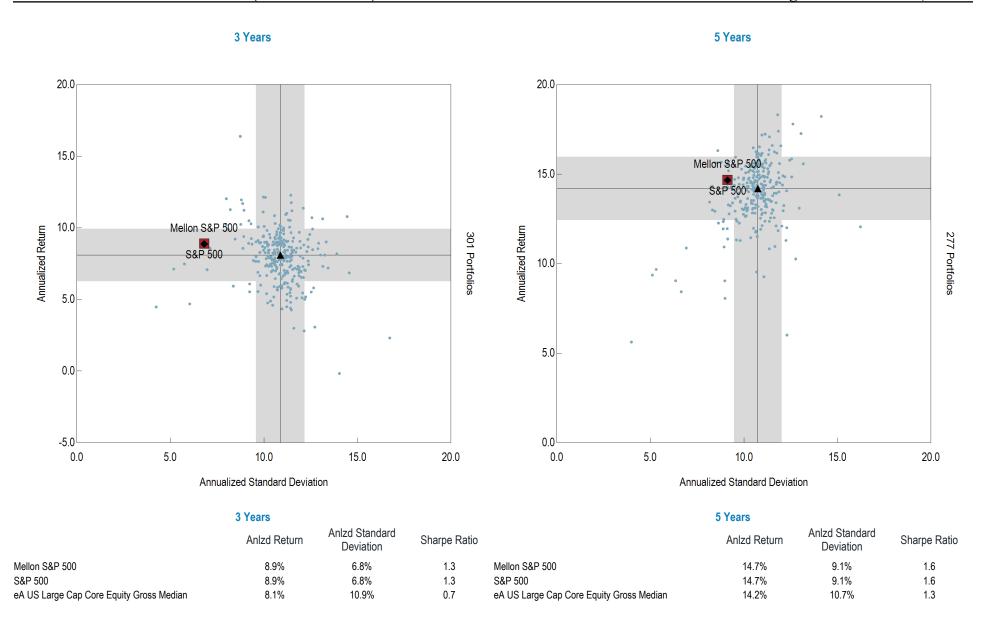


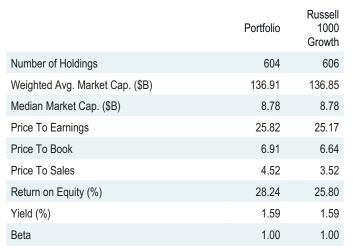
Rolling 3 Year Annualized Return (%)



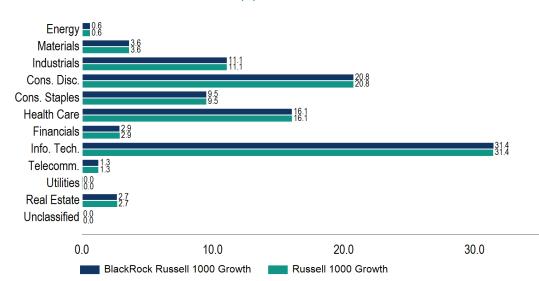
Rolling 5 Year Annualized Return (%)







Sector Allocation (%) vs Russell 1000 Growth



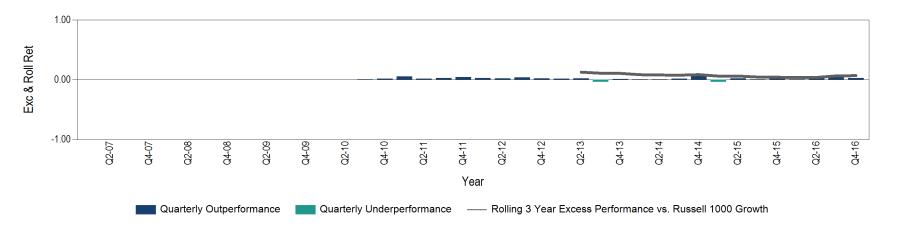
Largest Holdings

Top Contributors

Bottom Contributors

3										
	End Weight	Return		Avg Wgt	Return	Contribution	on	Avg Wgt	Return	Contribution
APPLE	5.53	2.98	MICROSOFT	4.31	8.60	0.37	AMAZON.COM	2.96	-10.44	-0.31
MICROSOFT	4.48	8.60	NVIDIA	0.38	56.01	0.21	FACEBOOK CLASS A	2.72	-10.31	-0.28
AMAZON.COM	2.77	-10.44	UNITEDHEALTH GROUP	1.32	14.77	0.19	AMGEN	1.09	-11.75	-0.13
FACEBOOK CLASS A	2.45	-10.31	WALT DISNEY	1.48	13.08	0.19	CVS HEALTH	0.81	-10.90	-0.09
ALPHABET 'A'	2.21	-1.44	APPLE	5.42	2.98	0.16	GILEAD SCIENCES	0.96	-8.92	-0.09
ALPHABET 'C'	2.18	-0.70	BOEING	0.81	19.08	0.15	VISA 'A'	1.48	-5.46	-0.08
WALT DISNEY	1.61	13.08	NETFLIX	0.44	25.62	0.11	SIMON PROPERTY	0.51	-13.41	-0.07
HOME DEPOT	1.59	4.75	ALTRIA GROUP	1.21	7.91	0.10	GROUP	0.51	-10.41	-0.07
COMCAST 'A'	1.46	4.93	TIME WARNER	0.43	21.78	0.09	ILLUMINA	0.21	-29.52	-0.06
UNITEDHEALTH GROUP	1.43	14.77	CELGENE	0.80	10.73	0.09	BIOGEN	0.62	-9.41	-0.06
							ELI LILLY	0.69	-7.76	-0.05

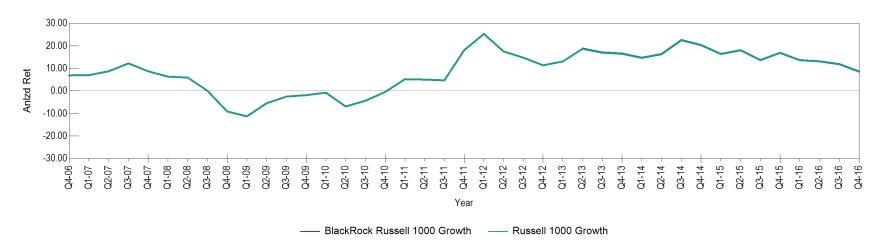




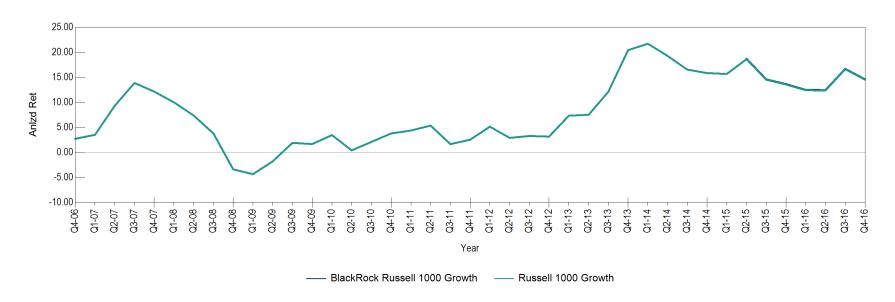
BlackRock Russell 1000 Growth vs. eA US Large Cap Growth Equity Gross Universe

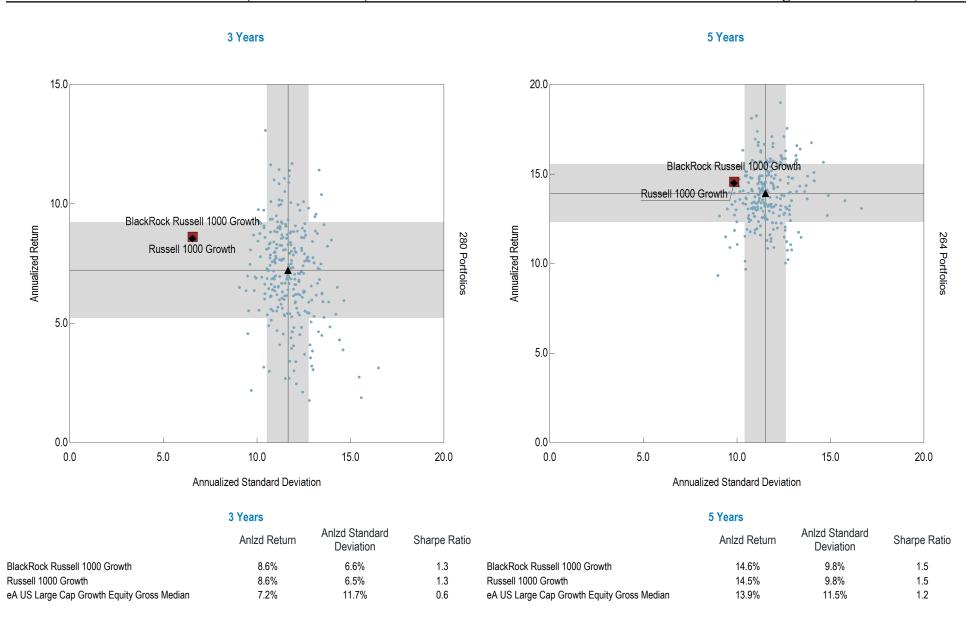


Rolling 3 Year Annualized Return (%)



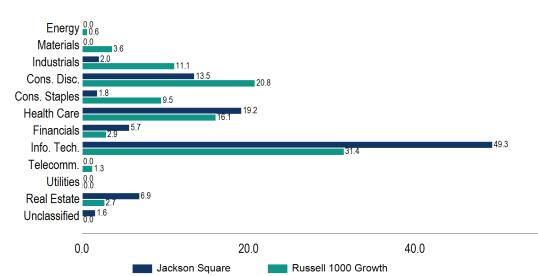
Rolling 5 Year Annualized Return (%)





	Portfolio	Russell 1000 Growth
Number of Holdings	31	606
Weighted Avg. Market Cap. (\$B)	103.38	136.85
Median Market Cap. (\$B)	32.24	8.78
Price To Earnings	30.59	25.17
Price To Book	6.51	6.64
Price To Sales	6.84	3.52
Return on Equity (%)	21.86	25.80
Yield (%)	1.07	1.59
Beta	1.42	1.00

Sector Allocation (%) vs Russell 1000 Growth



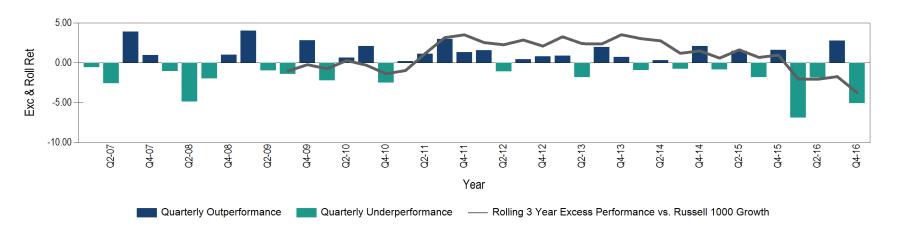
Largest Holdings

Top Contributors

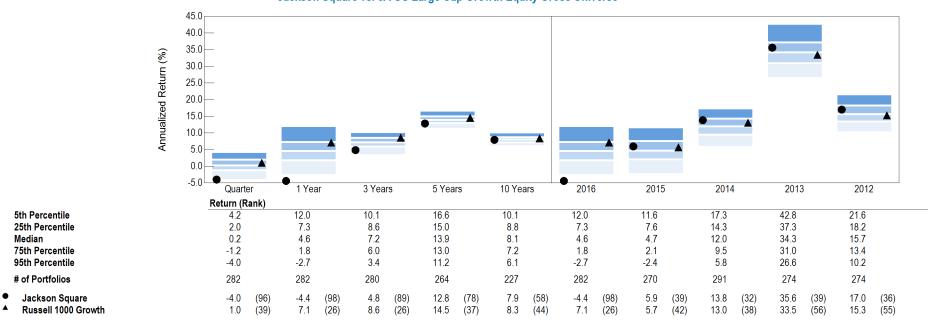
Bottom Contributors

goot rioiamigo											
		End Weight	Return		Avg Wgt	Return	Contribution	1	Avg Wgt	Return	Contribution
	MICROSOFT	6.20	8.60	CELGENE	5.26	10.73	0.56	TRIPADVISOR 'A'	2.93	-26.61	-0.78
	VISA 'A'	5.75	-5.46	MICROSOFT	5.16	8.60	0.44	NIELSEN	2.27	-21.12	-0.48
	CELGENE	5.71	10.73	INTERCONTINENTAL EX.	3.59	5.03	0.18	FACEBOOK CLASS A	4.18	-10.31	-0.43
	PAYPAL HOLDINGS	5.50	-3.66	CHARLES SCHWAB	0.62	25.28	0.16	EBAY	4.03	-9.76	-0.39
	MASTERCARD	4.68	1.64	DOLLAR GENERAL	1.53	6.18	0.09	ALLERGAN	4.14	-8.60	-0.36
	CROWN CASTLE INTL.	4.52	-6.88	INTUIT	1.99	4.51	0.09	VISA 'A'	5.85	-5.46	-0.32
	LIBERTY INTACT.QVC GROUP 'A'	4.25	-0.15	MASTERCARD	4.61	1.64	0.08	CROWN CASTLE INTL.	4.57	-6.88	-0.31
	ALLERGAN	4.20	-8.60	WALGREENS BOOTS	1.80	3.12	0.06	ELECTRONIC ARTS	3.94	-7.78	-0.31
	EBAY	4.18	-9.76	ALLIANCE	1.00	3.12	0.00	QUALCOMM	5.27	-4.07	-0.21
	ELECTRONIC ARTS	3.90	-7.78	EQUINIX	2.30	-0.26	-0.01	PAYPAL HOLDINGS	5.55	-3.66	-0.20
				LIBERTY INTACT.QVC GROUP 'A'	4.12	-0.15	-0.01				



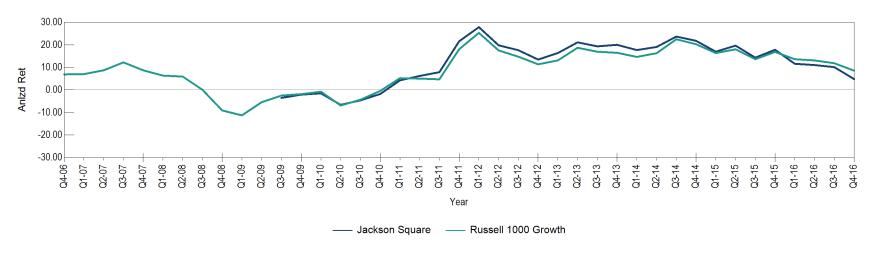


Jackson Square vs. eA US Large Cap Growth Equity Gross Universe

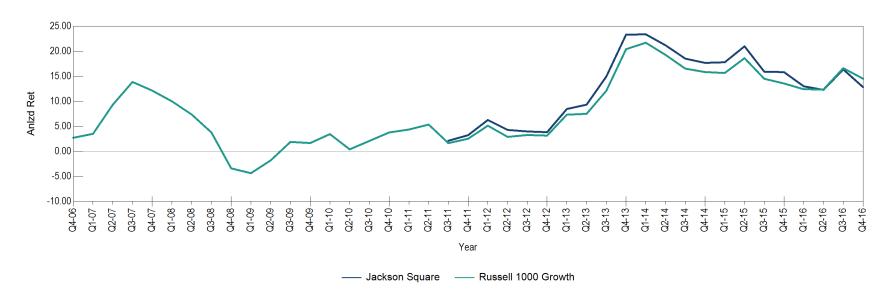


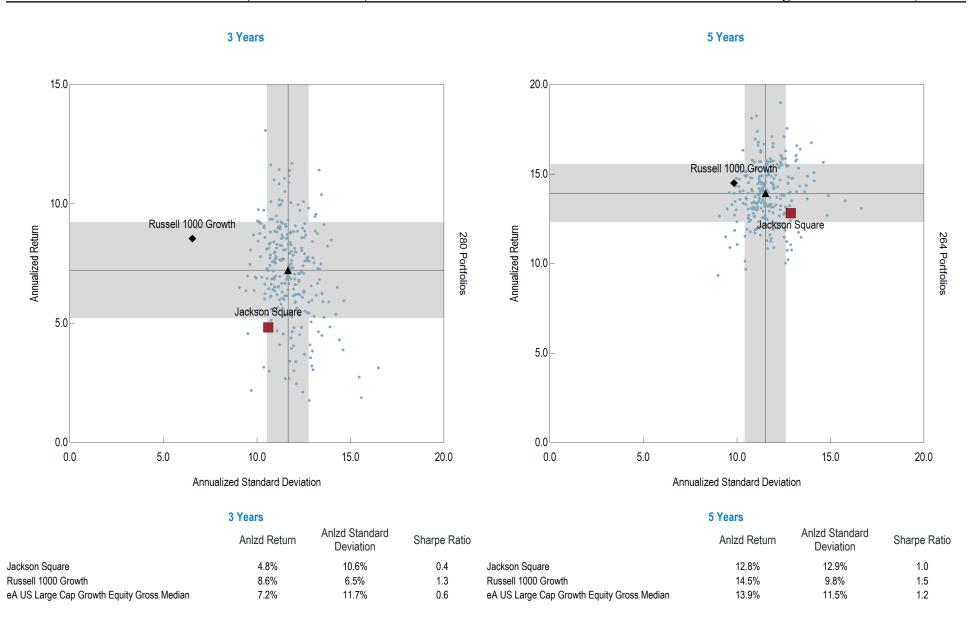


Rolling 3 Year Annualized Return (%)



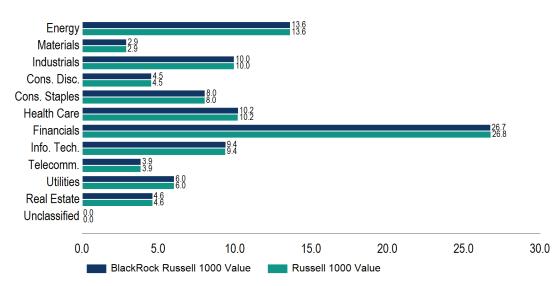
Rolling 5 Year Annualized Return (%)





	Portfolio	Russell 1000 Value
Number of Holdings	694	696
Weighted Avg. Market Cap. (\$B)	113.99	113.99
Median Market Cap. (\$B)	7.99	7.99
Price To Earnings	20.85	19.78
Price To Book	2.40	2.39
Price To Sales	2.59	2.81
Return on Equity (%)	13.14	11.64
Yield (%)	2.46	2.44
Beta	0.99	1.00

Sector Allocation (%) vs Russell 1000 Value



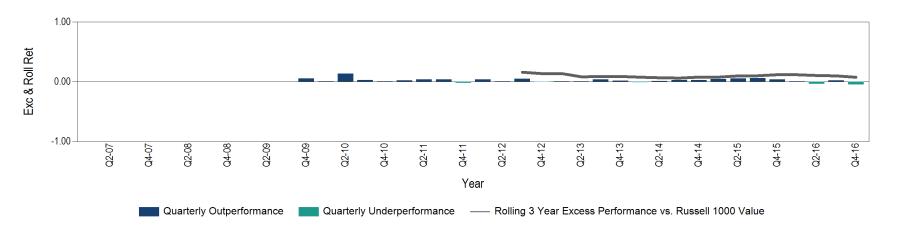
Largest Holdings

Top Contributors

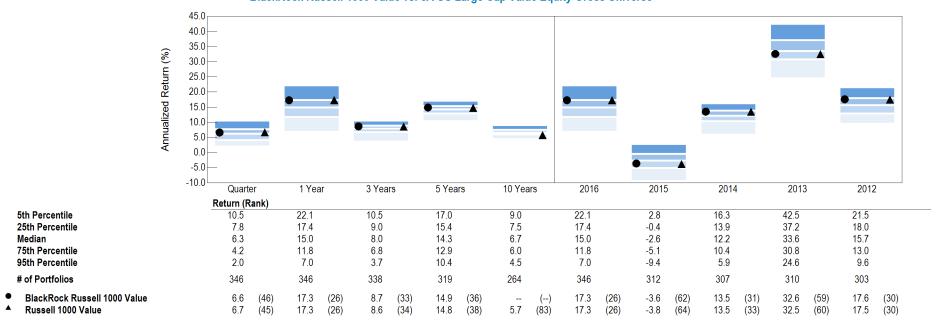
Bottom Contributors

	End Weight	Return		Avg Wgt	Return	Contribution	1	Avg Wgt	Return	Contribution
EXXON MOBIL	3.42	4.32	JP MORGAN CHASE &	2.50	30.52	0.76	MEDTRONIC	1.08	-17.06	-0.18
JP MORGAN CHASE & CO.	2.85	30.52	CO.	2.00	00.02	0.10	PROCTER & GAMBLE	2.14	-5.58	-0.12
BERKSHIRE HATHAWAY 'B'	2.80	12.81	BANK OF AMERICA	1.74	41.72	0.73	MERCK & COMPANY	1.61	-4.95	-0.08
AT&T	2.38	6.01	WELLS FARGO & CO	2.08	25.50	0.53	PHILIP MORRIS INTL.	1.24	-4.81	-0.06
JOHNSON & JOHNSON	2.38	-1.80	CITIGROUP	1.42	26.25	0.37	CISCO SYSTEMS	1.48	-3.94	-0.06
WELLS FARGO & CO	2.29	25.50	BERKSHIRE HATHAWAY	2.68	12.81	0.34	PFIZER	1.73	-3.14	-0.05
GENERAL ELECTRIC	2.13	7.49	'B'	0.00	40.00	0.04	COLGATE-PALM.	0.48	-11.25	-0.05
BANK OF AMERICA	2.06	41.72	GOLDMAN SACHS GP.	0.68	48.93	0.34	ABBOTT LABORATORIES	0.56	-8.60	-0.05
CHEVRON	2.01	15.50	CHEVRON	1.91	15.50	0.30	INTEL	1.47	-3.18	-0.05
PROCTER & GAMBLE	1.95	-5.58	MORGAN STANLEY	0.48	32.56	0.16	JOHNSON & JOHNSON	2.50	-1.80	-0.04
			GENERAL ELECTRIC	2.11	7.49	0.16				
			EXXON MOBIL	3.42	4.32	0.15				

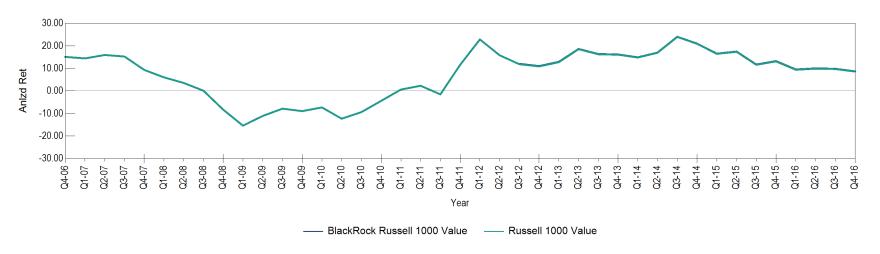




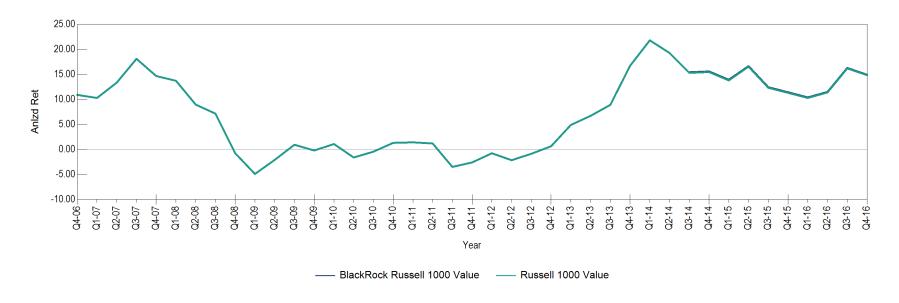
BlackRock Russell 1000 Value vs. eA US Large Cap Value Equity Gross Universe

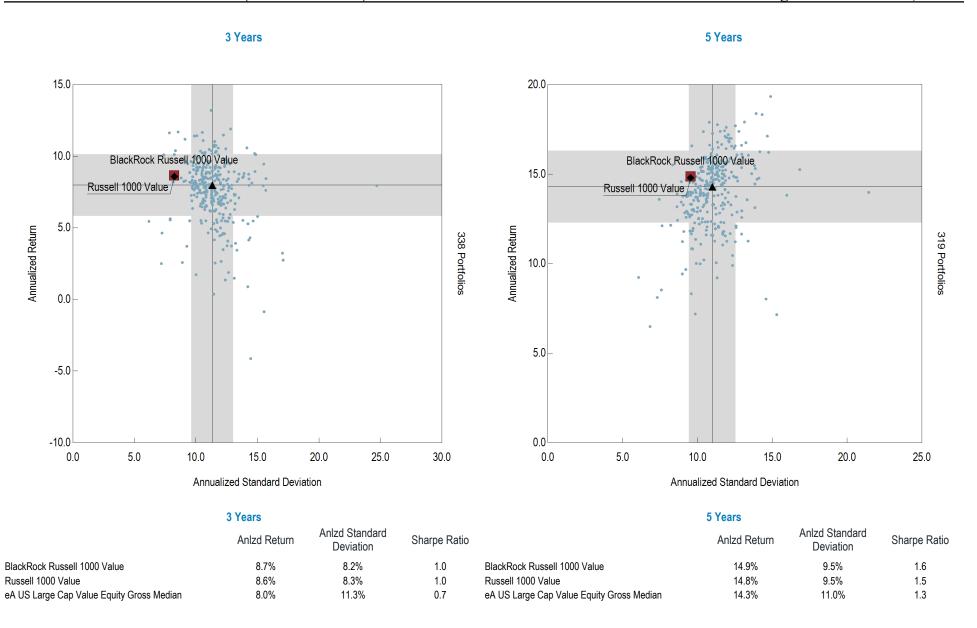


Rolling 3 Year Annualized Return (%)



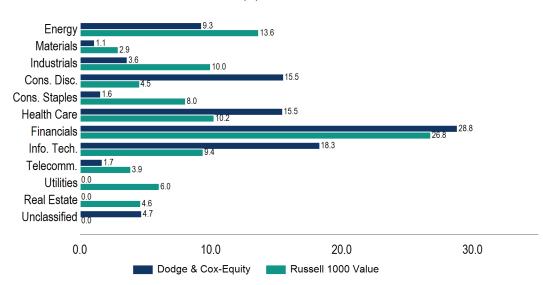
Rolling 5 Year Annualized Return (%)





	Portfolio	Russell 1000 Value
Number of Holdings	67	696
Weighted Avg. Market Cap. (\$B)	106.73	113.99
Median Market Cap. (\$B)	38.97	7.99
Price To Earnings	18.22	19.78
Price To Book	2.92	2.39
Price To Sales	2.55	2.81
Return on Equity (%)	12.83	11.64
Yield (%)	1.75	2.44
Beta	1.06	1.00

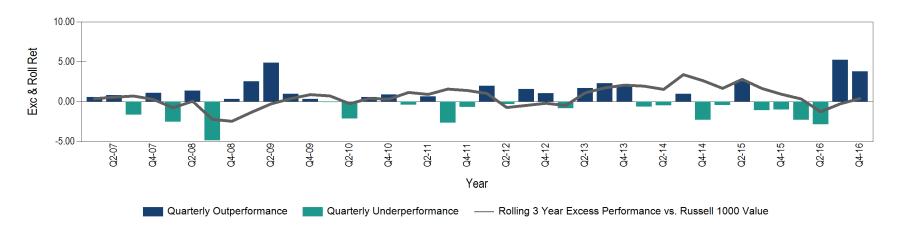
Sector Allocation (%) vs Russell 1000 Value



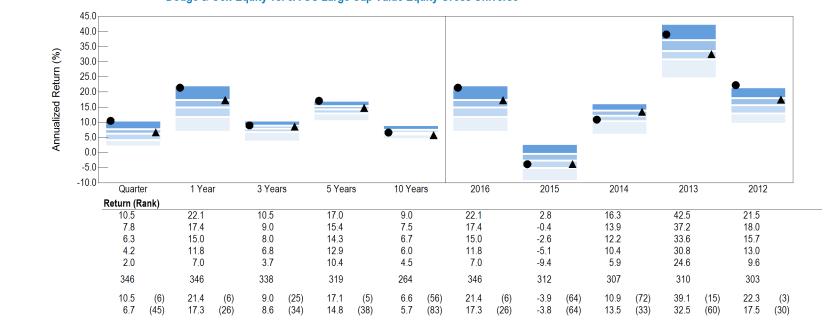
Largest Holdings Top Contributors Bottom Contributors

	End Weight	Return		Avg Wgt	Return	Contribution	on	Avg Wgt	Return	Contribution
BANK OF AMERICA	3.97	41.72	BANK OF AMERICA	3.96	41.72	1.65	ASTRAZENECA	1.37	-16.86	-0.23
WELLS FARGO & CO	3.84	25.50	GOLDMAN SACHS GP.	2.62	48.93	1.28	SPN.ADR.2:1	1.07	10.00	0.20
CAPITAL ONE FINL.	3.83	22.09	WELLS FARGO & CO	3.48	25.50	0.89	NOVARTIS 'B' SPN.ADR	2.62	-7.75	-0.20
CHARLES SCHWAB	3.75	25.28	CHARLES SCHWAB	3.51	25.28	0.89	1:1	0.00	47.00	0.45
HEWLETT PACKARD ENTER.	3.29	2.24	CAPITAL ONE FINL.	3.80	22.09	0.84	MEDTRONIC	0.89	-17.06	-0.15
GOLDMAN SACHS GP.	3.15	48.93	TIME WARNER	3.26	21.78	0.71	ALNYLAM PHARMACEUTICALS	0.30	-44.76	-0.13
TIME WARNER	3.08	21.78	JP MORGAN CHASE &	2.14	30.52	0.65	CISCO SYSTEMS	2.08	-3.94	-0.08
CHARTER COMMS.CL.A	2.97	6.65	CO.				HEWLETT-PACKARD	1.97	-3.64	-0.07
COMCAST 'A'	2.83	4.93	BAKER HUGHES	1.86	29.13	0.54	WAL MART STORES	1.71	-3.48	-0.06
SANOFI ADR 2:1	2.81	5.89	BANK OF NEW YORK	2.50	19.33	0.48	SYMANTEC	0.97	-4.52	-0.04
			MELLON	2.00	10.00	0.10		0.97	-4.32	-0.04
			METLIFE	2.03	22.32	0.45	EXPRESS SCRIPTS HOLDING	1.57	-2.47	-0.04
							CONCHO RESOURCES	0.82	-3.46	-0.03





Dodge & Cox-Equity vs. eA US Large Cap Value Equity Gross Universe



95th Percentile
of Portfolios

■ Dodge & Cox-Equity
Russell 1000 Value

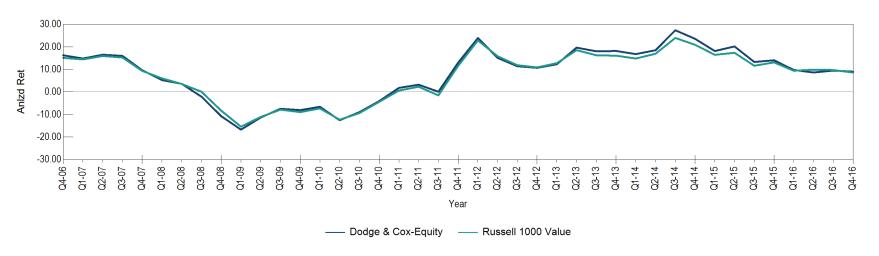
5th Percentile

25th Percentile

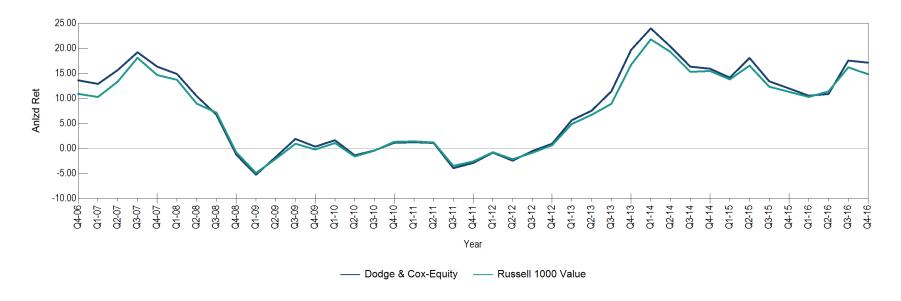
75th Percentile

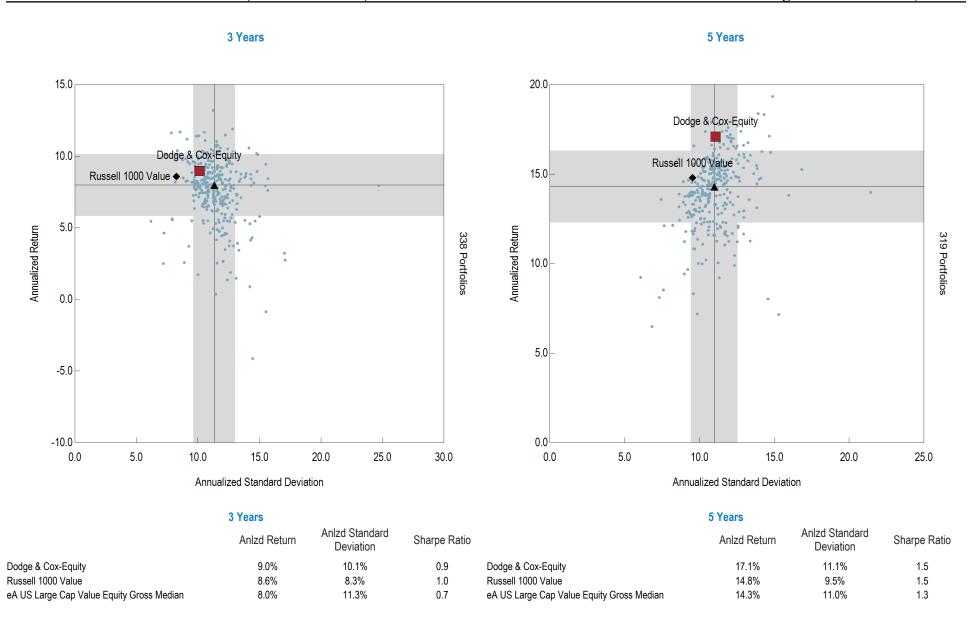
Median

Rolling 3 Year Annualized Return (%)



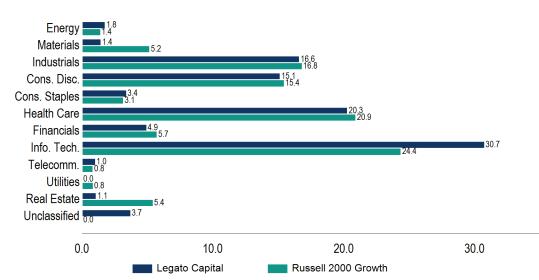
Rolling 5 Year Annualized Return (%)





	Portfolio	Russell 2000 Growth
Number of Holdings	237	1,177
Weighted Avg. Market Cap. (\$B)	2.46	2.16
Median Market Cap. (\$B)	2.33	0.85
Price To Earnings	32.69	28.99
Price To Book	5.18	4.81
Price To Sales	4.02	2.67
Return on Equity (%)	14.87	15.04
Yield (%)	0.41	0.61
Beta	0.97	1.00

Sector Allocation (%) vs Russell 2000 Growth



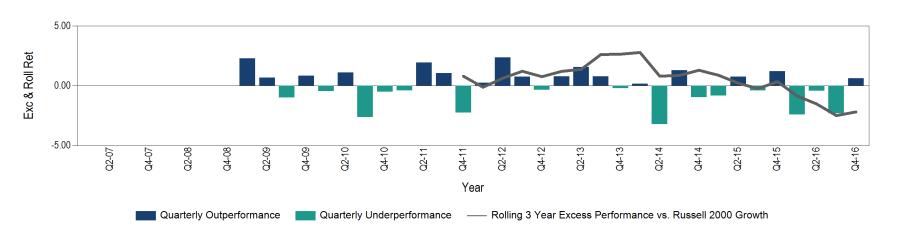
Largest Holdings

Top Contributors

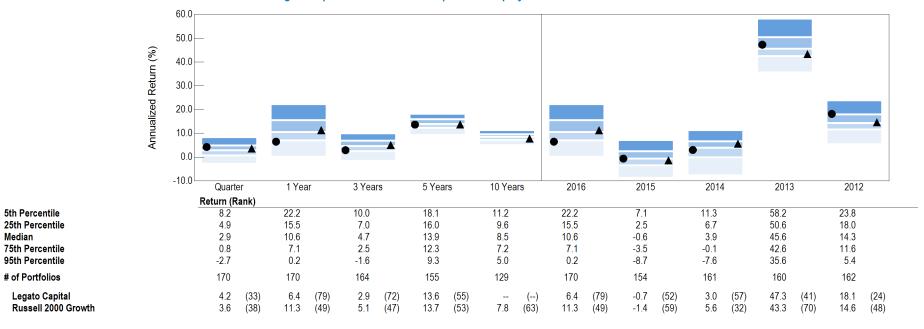
Bottom Contributors

·	End Weight	Return		Avg Wgt	Return	Contributio	n	Avg Wgt	Return	Contribution
STAMPS.COM	2.29	21.31	LIFELOCK	2.28	41.37	0.94	ADVISORY BOARD	0.78	-25.68	-0.20
LIGAND PHARMS.'B'	1.80	-0.44	STAMPS.COM	2.09	21.31	0.45	NEKTAR THERAPEUTICS	0.68	-28.58	-0.19
INC RESEARCH HOLDINGS CL.A	1.71	17.99	DAVE & BUSTER'S ENTM.	1.00	43.70	0.43	NEVRO	0.57	-30.40	-0.17
ECHO GLOBAL LOGISTICS	1.66	8.63	INC RESEARCH	1.50	17.99	0.27	PAYLOCITY HOLDING	0.53	-32.50	-0.17
DAVE & BUSTER'S ENTM.	1.46	43.70	HOLDINGS CL.A	1.50	17.55	0.21	OPHTHOTECH	0.15	-89.53	-0.14
SYNCHRONOSS TECHNOLOGIES	1.40	-6.99	BLACKHAWK NETWORK HDG.	1.04	24.88	0.26	SYNCHRONOSS TECHNOLOGIES	1.84	-6.99	-0.13
POOL	1.29	10.75	BANK OF THE OZARKS	0.69	37.54	0.26	SHUTTERSTOCK	0.49	-25.40	-0.12
CRITEO ADR 1:1	1.22	17.00	TETRA TECH	1.00	21.91	0.22	IGI LABORATORIES	0.91	-13.03	-0.12
BLACKHAWK NETWORK HDG.	1.19	24.88	MICROSEMI	0.75	28.56	0.21	BROADSOFT	1.01	-11.39	-0.11
NEXSTAR BCAST.GP.	1.18	10.24	CARDTRONICS	0.92	22.35	0.21	RADIUS HEALTH	0.36	-29.69	-0.11
			TEAM HEALTH HOLDINGS	0.61	33.45	0.20				



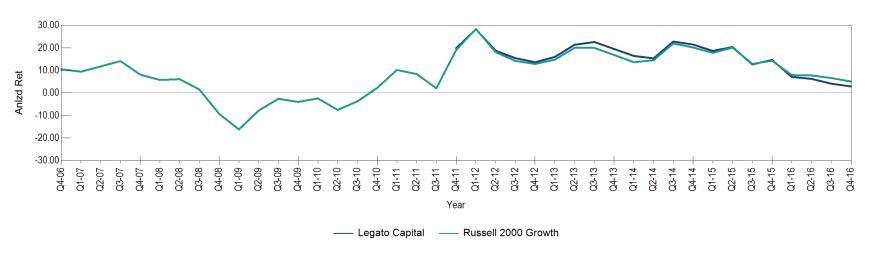


Legato Capital vs. eA US Small Cap Growth Equity Gross Universe

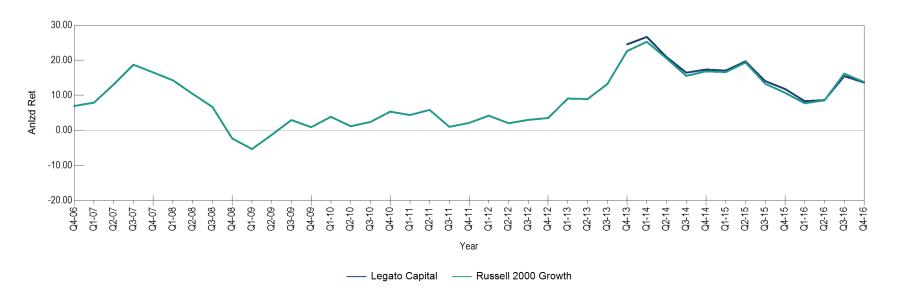


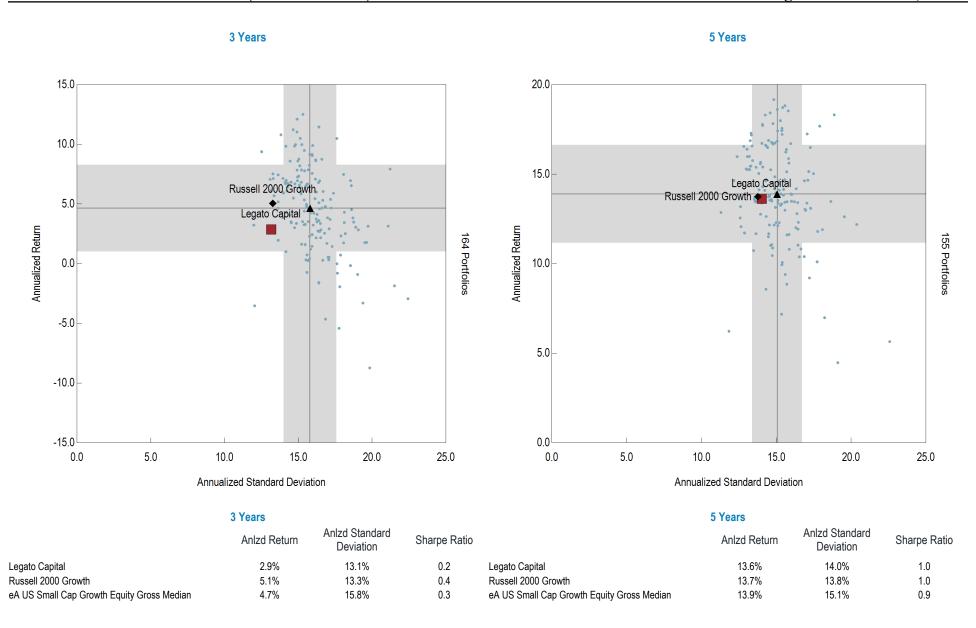
Median

Rolling 3 Year Annualized Return (%)



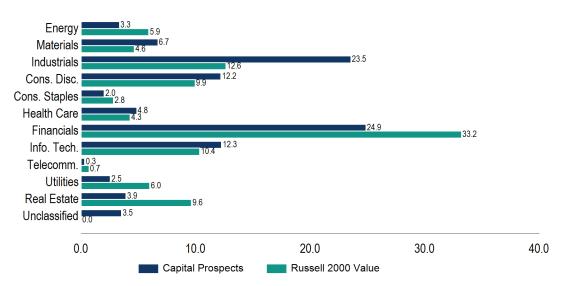
Rolling 5 Year Annualized Return (%)





	Portfolio	Russell 2000 Value
Number of Holdings	306	1,369
Weighted Avg. Market Cap. (\$B)	2.11	2.00
Median Market Cap. (\$B)	1.16	0.70
Price To Earnings	23.64	21.49
Price To Book	3.19	1.84
Price To Sales	1.94	1.59
Return on Equity (%)	12.23	7.20
Yield (%)	1.63	1.57
Beta	0.89	1.00

Sector Allocation (%) vs Russell 2000 Value



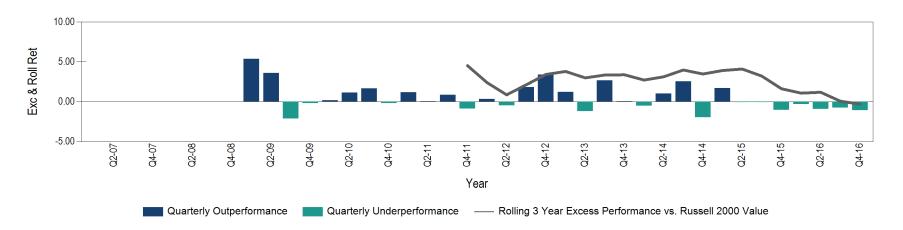
Largest	: Hol	dings		
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Holdings		Top Contributors
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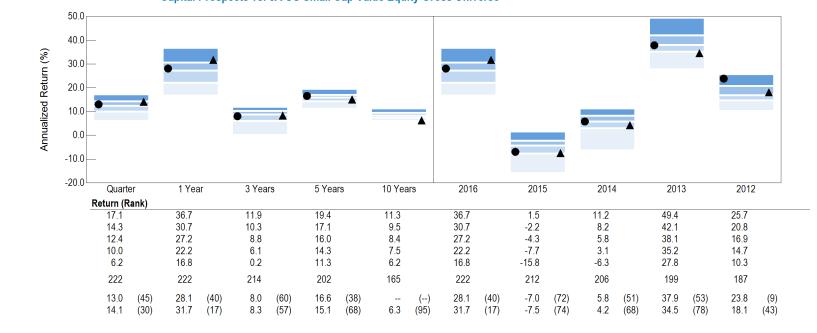
Bottom Contributors

•	End Weight	Return		Avg Wgt	Return	Contributio	n	Avg Wgt	Return	Contribution
LITTELFUSE	1.28	18.09	TEXAS CAPITAL	0.73	42.75	0.31	ADVISORY BOARD	0.62	-25.68	-0.16
HILLENBRAND	1.25	21.88	BANCSHARES	0.75	42.73	0.51	GNC HOLDINGS CL.A	0.19	-45.11	-0.09
MB FINANCIAL	1.23	24.67	MB FINANCIAL	1.12	24.67	0.28	ALCOA	0.42	-18.49	-0.08
ALLETE	1.17	8.62	HILLENBRAND	1.16	21.88	0.25	RADISYS	0.41	-17.12	-0.07
GORES HOLDINGS CL.A	1.15	20.37	IBERIABANK	0.96	25.30	0.24	HURON CNSL.GP.	0.42	-15.24	-0.06
IBERIABANK	1.03	25.30	GORES HOLDINGS CL.A	1.14	20.37	0.23	RANGE RES.	0.51	-11.28	-0.06
ARTISAN PTNS.ASTMGMT.	0.90	11.81	LITTELFUSE	1.28	18.09	0.23	CHAS.RVR.LABS.INTL.	0.65	-8.58	-0.06
AIR LEASE	0.89	20.36	MICROSEMI	0.80	28.56	0.23	OCH-ZIFF	0.00	00.70	0.05
JOHN BEAN TECHNOLOGIES	0.88	21.96	EVERCORE PARTNERS	0.66	34.05	0.22	CAP.MAN.GP.CL.A	0.22	-23.73	-0.05
ABM INDS.	0.86	3.30	'A'	0.00	04.00	0.22	HEALTHCARE REAL.TST.	0.43	-10.04	-0.04
			STEELCASE 'A'	0.74	29.73	0.22	VERINT SYSTEMS	0.66	-6.32	-0.04
			META FINANCIAL GROUP	0.30	70.01	0.21				





Capital Prospects vs. eA US Small Cap Value Equity Gross Universe



5th Percentile

25th Percentile

75th Percentile

95th Percentile

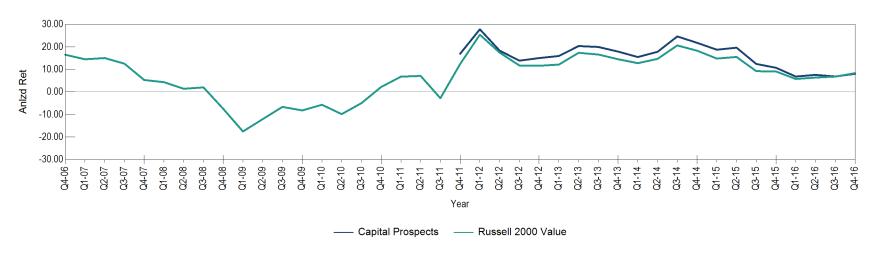
of Portfolios

Capital Prospects

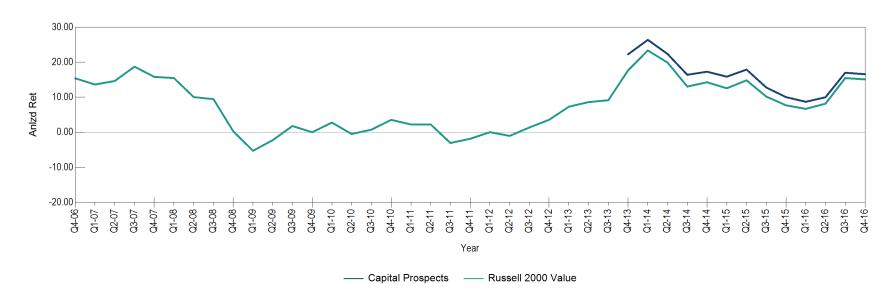
Russell 2000 Value

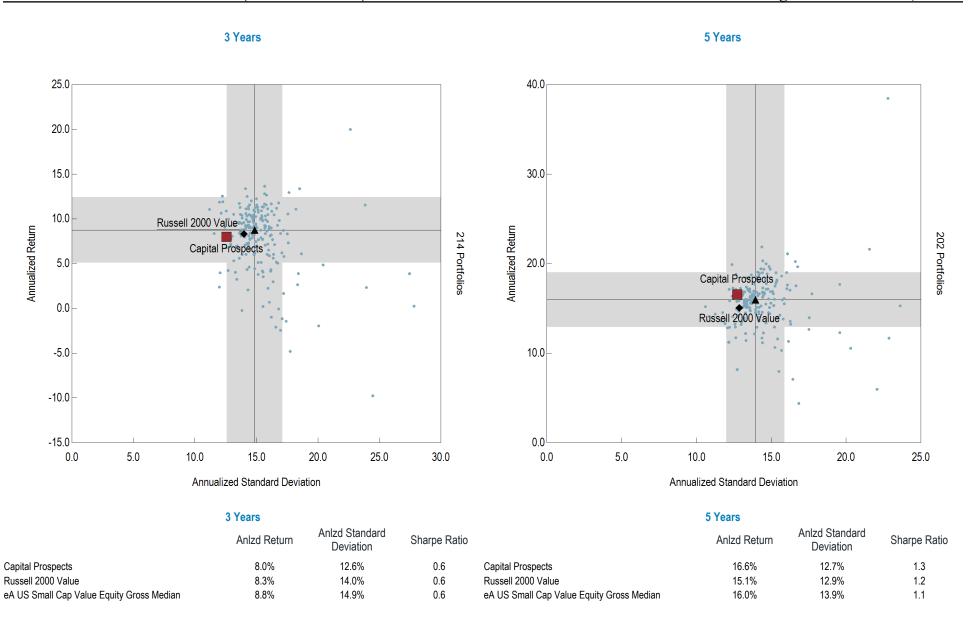
Median

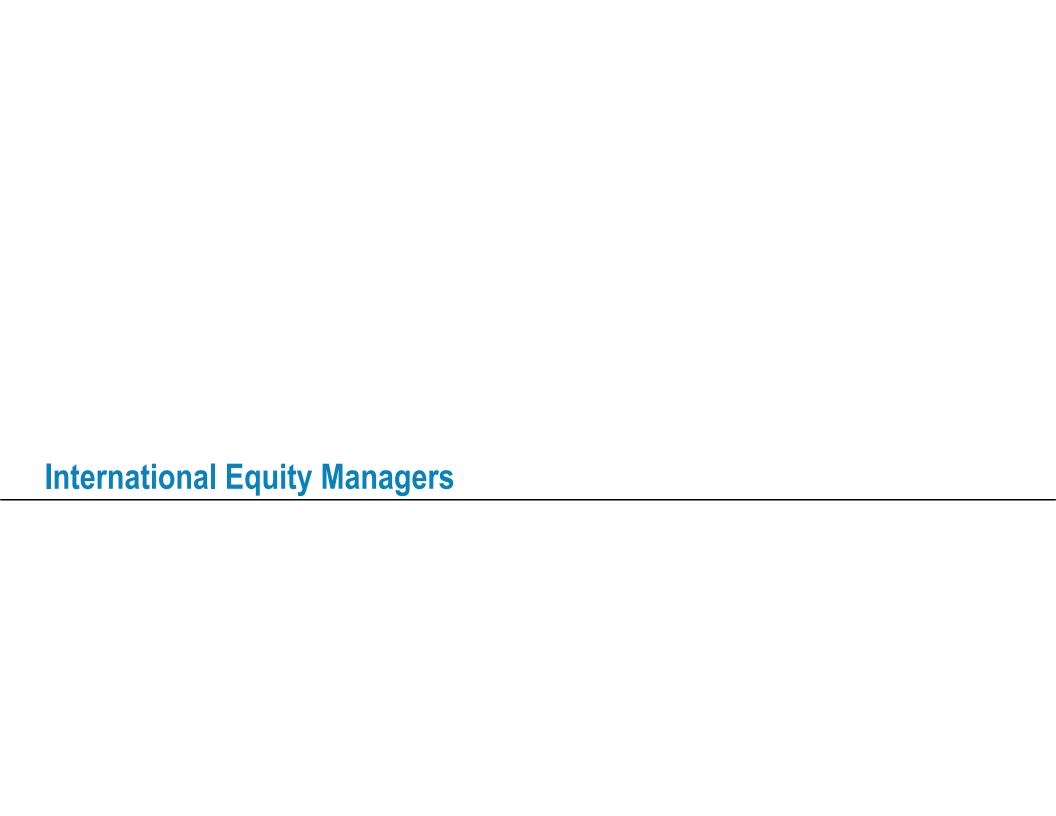
Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)

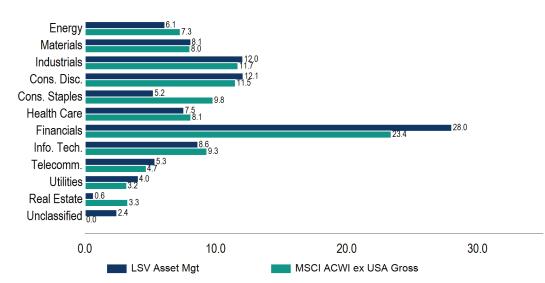






	Portfolio	MSCI ACWI ex USA Gross
Number of Holdings	256	1,856
Weighted Avg. Market Cap. (\$B)	29.22	49.20
Median Market Cap. (\$B)	6.48	6.74
Price To Earnings	14.02	20.17
Price To Book	1.77	2.53
Price To Sales	1.00	1.91
Return on Equity (%)	12.26	13.24
Yield (%)	3.60	2.93
Beta	1.10	1.00

Sector Allocation (%) vs MSCI ACWI ex USA Gross



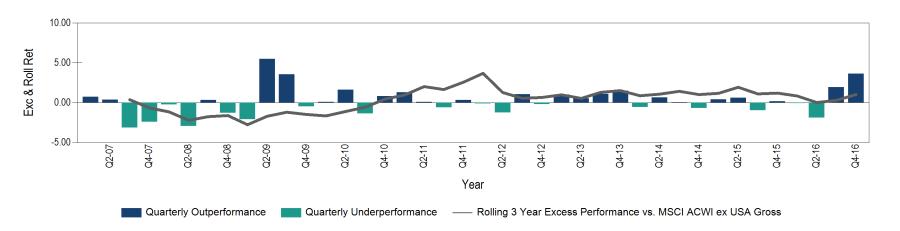
Largest Holdings

Top Contributors

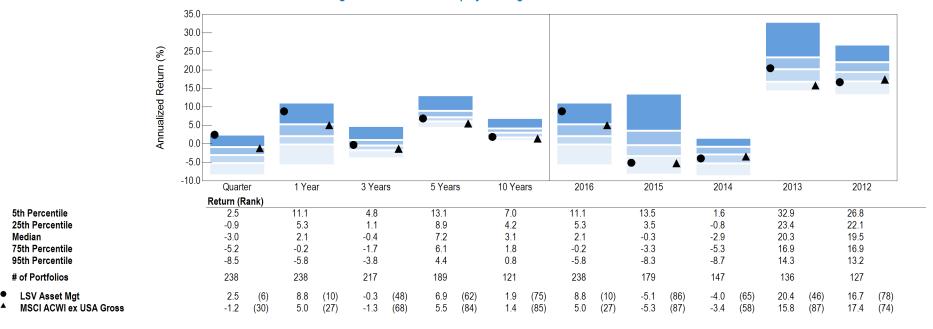
Bottom Contributors

	End Weight	Return		Avg Wgt	Return	Contribution	on	Avg Wgt	Return	Contribution
SAMSUNG ELECTRONICS	1.79	2.83	SOCIETE GENERALE	0.61	42.54	0.26	KT & G	0.57	-26.32	-0.15
SANOFI	1.71	6.71	RESONA HOLDINGS	0.71	23.25	0.17	NIPPON TELG. & TEL.	1.66	-7.57	-0.13
NIPPON TELG. & TEL.	1.55	-7.57	MITSUBISHI GAS CHM.	0.69	20.20	0.14	TEVA PHARMACEUTICAL	0.53	-23.43	-0.12
BAE SYSTEMS	1.32	9.08	BNP PARIBAS	0.56	24.17	0.14	KOREA ELECTRIC	0.43	-25.62	-0.11
MAGNA INTL.	1.26	2.07	ALLIANZ	1.18	11.05	0.13	POWER	0.70	-20.02	-0.11
ALLIANZ	1.23	11.05	AEGON	0.29	43.86	0.13	KDDI	0.60	-17.51	-0.11
SWISS RE	1.10	5.01	DEUTSCHE BANK	0.32	38.35	0.12	AHOLD KON.	1.23	-7.34	-0.09
SWISS LIFE HOLDING	1.06	9.30	OMV	0.53	22.95	0.12	SKYWORTH DIGITAL HDG.	0.42	-19.08	-0.08
DAIMLER	1.02	5.99	BAE SYSTEMS	1.30	9.08	0.12				
BASF	0.96	8.92	AXA	0.61	18.86	0.11	CIA PARANAENSE DE ENERGIA COPEL PN	0.42	-18.79	-0.08
							EMPIRE 'A'	0.36	-20.86	-0.08
							DISTRIBUIDORA INTNAC.DE ALIMENTACION	0.35	-20.55	-0.07

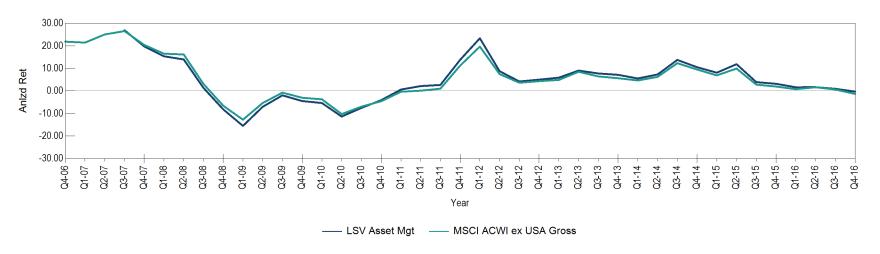




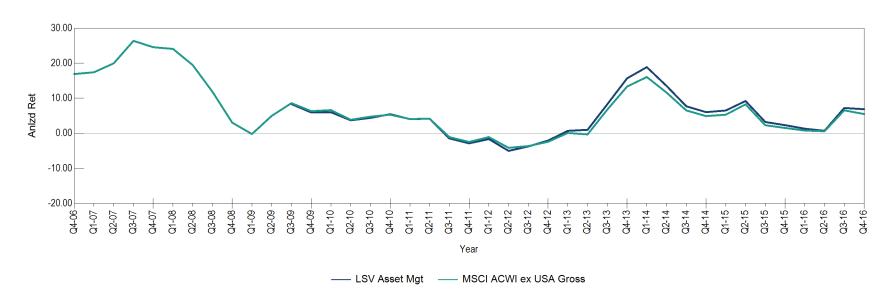
LSV Asset Mgt vs. eA ACWI ex-US Equity Unhedged Gross Universe

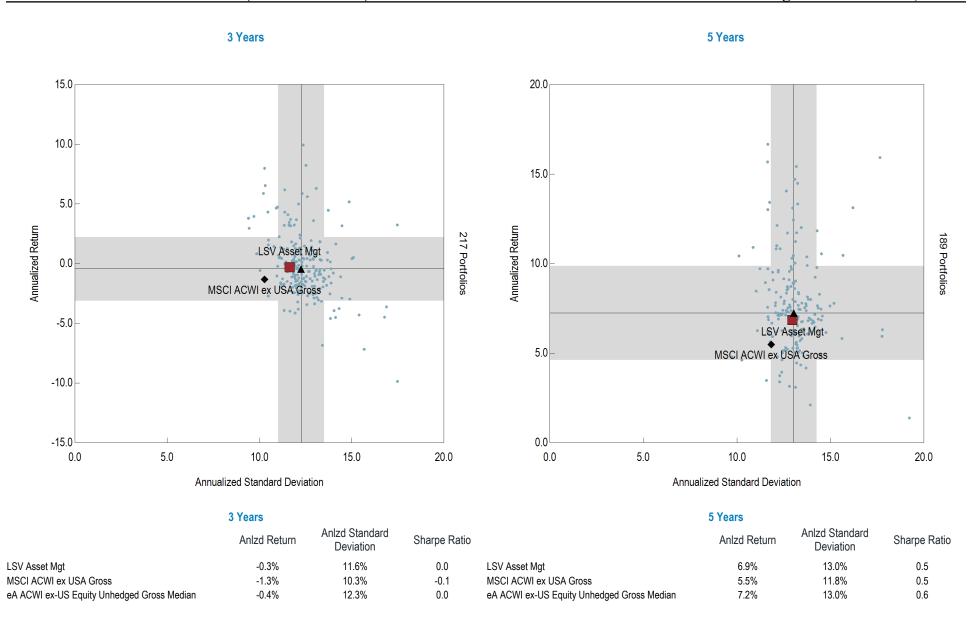


Rolling 3 Year Annualized Return (%)



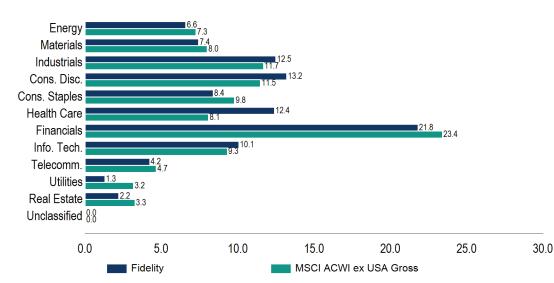
Rolling 5 Year Annualized Return (%)





MSCI Portfolio ACWI ex **USA Gross** Number of Holdings 289 1,856 Weighted Avg. Market Cap. (\$B) 47.25 49.20 Median Market Cap. (\$B) 12.54 6.74 Price To Earnings 22.64 20.17 Price To Book 3.44 2.53 Price To Sales 2.57 1.91 Return on Equity (%) 16.39 13.24 Yield (%) 2.69 2.93 Beta 0.89 1.00

Sector Allocation (%) vs MSCI ACWI ex USA Gross

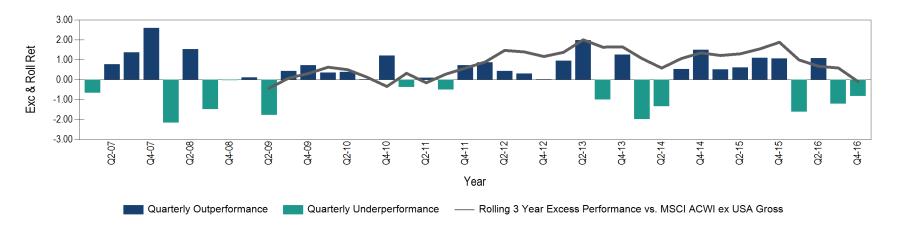


Largest Holdings Top Contributo

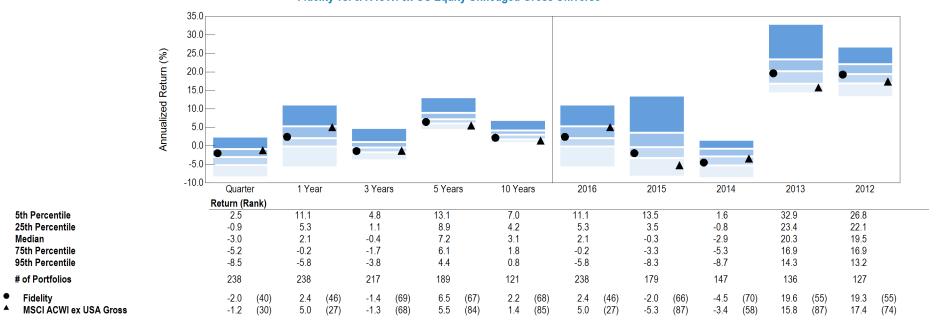
l op Contributor	rs		Bottom Contributors				
Avg Wgt	Return	Contribution	Avg Wgt	Retu			

	End Weight	Return		Avg Wgt	Return	Contributio	n	Avg Wgt	Return	Contribution
NESTLE 'R'	1.70	-8.98	MITSUBISHI UFJ FINL.GP.	0.80	23.80	0.19	INTERNATIONAL	0.52	-36.96	-0.19
SAP	1.41	-4.61	BNP PARIBAS	0.74	24.17	0.18	PSNL.FIN.	0.02	00.00	0.10
ROYAL DUTCH SHELL A	1.30	10.01	BARCLAYS	0.63	26.67	0.17	AIA GROUP	1.18	-15.10	-0.18
ROCHE HOLDING	1.23	-7.94	AXA	0.76	18.86	0.14	NESTLE 'R'	1.73	-8.98	-0.15
TOTAL	1.20	9.83	ROYAL DUTCH SHELL A	1.17	10.01	0.12	NASPERS	0.96	-14.73	-0.14
BRITISH AMERICAN TOBACCO	1.16	-10.83	ING GROEP	0.80	14.18	0.11	KDDI	0.77	-17.51	-0.13
PHILIPS ELTN.KONINKLIJKE	1.13	3.18	TOTAL	1.10	9.83	0.11	BRITISH AMERICAN TOBACCO	1.17	-10.83	-0.13
AIA GROUP	1.03	-15.10	ROYAL DUTCH SHELL	0.87	11.45	0.10	SQUARE ENIX HOLDINGS	0.49	-24.81	-0.12
SHIRE	1.02	-10.85	A(LON)							
SAMSUNG ELECTRONICS	1.00	2.83	DNB	0.68	13.87	0.09	SHIRE	1.00	-10.85	-0.11
			PRUDENTIAL	0.67	13.29	0.09	ROCHE HOLDING	1.26	-7.94	-0.10
							TEVA PHARMACEUTICAL	0.35	-23.43	-0.08





Fidelity vs. eA ACWI ex-US Equity Unhedged Gross Universe

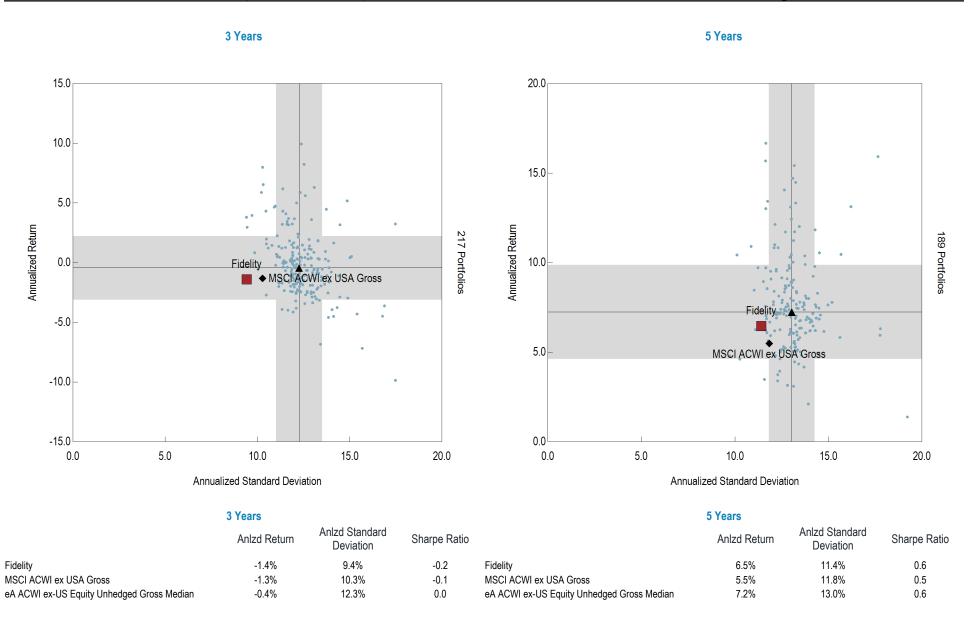


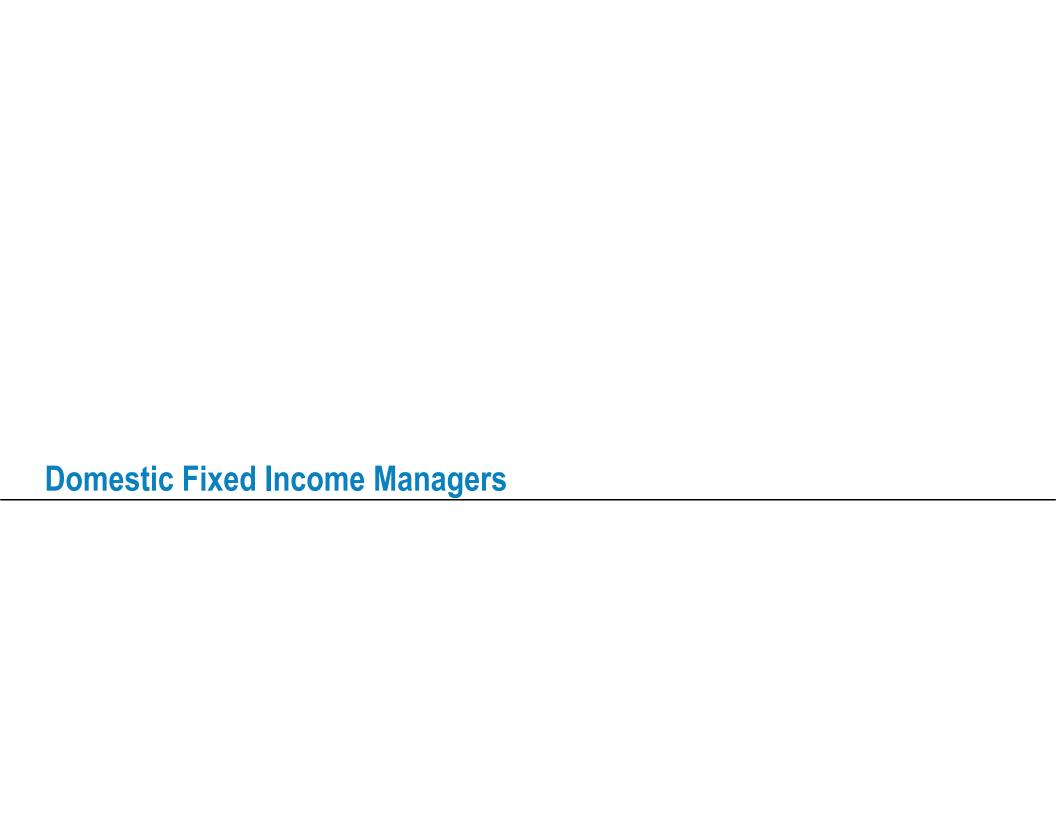
Rolling 3 Year Annualized Return (%)



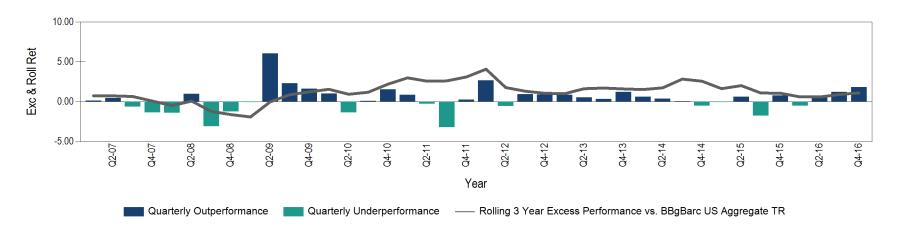
Rolling 5 Year Annualized Return (%)



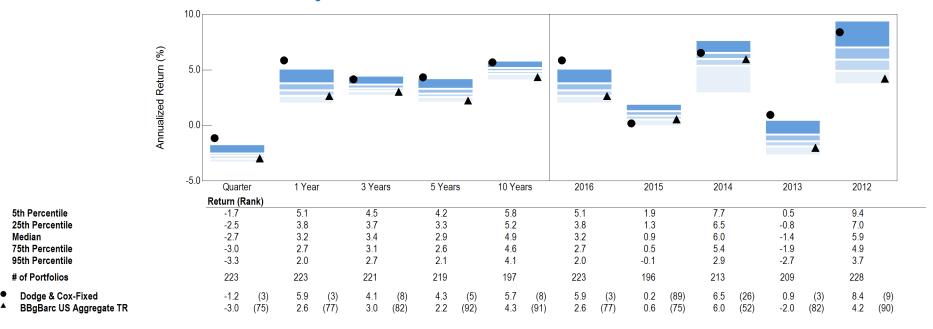


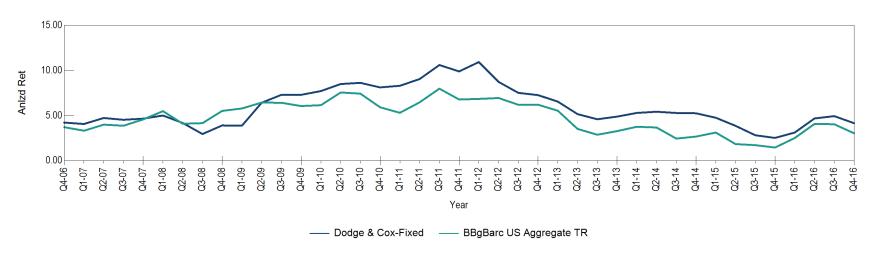


Rolling Annualized Excess Performance

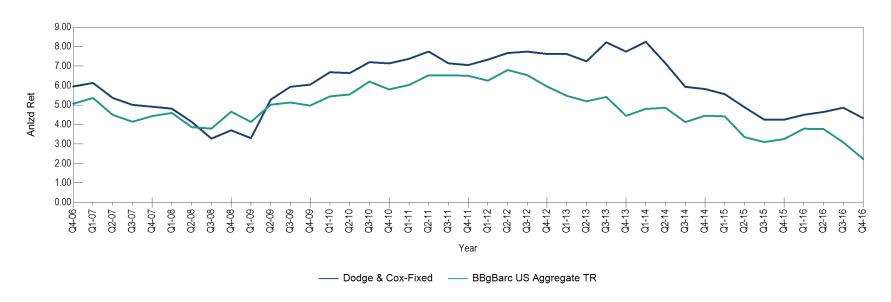


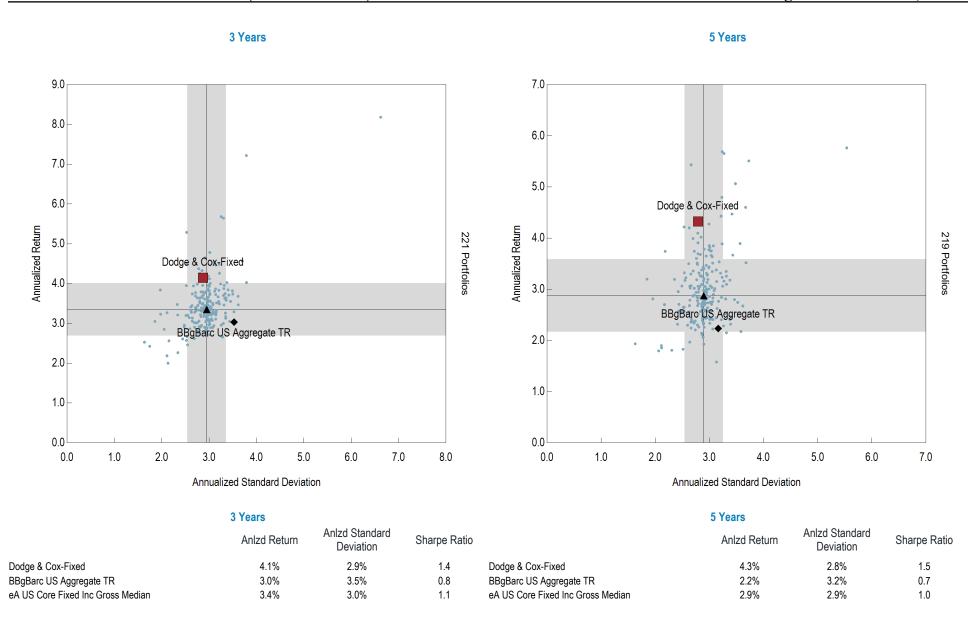
Dodge & Cox-Fixed vs. eA US Core Fixed Inc Gross Universe



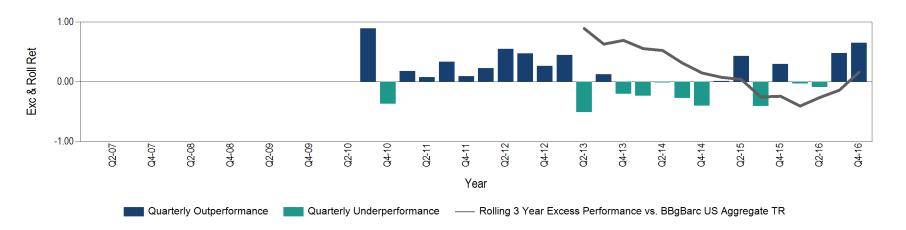


Rolling 5 Year Annualized Return (%)

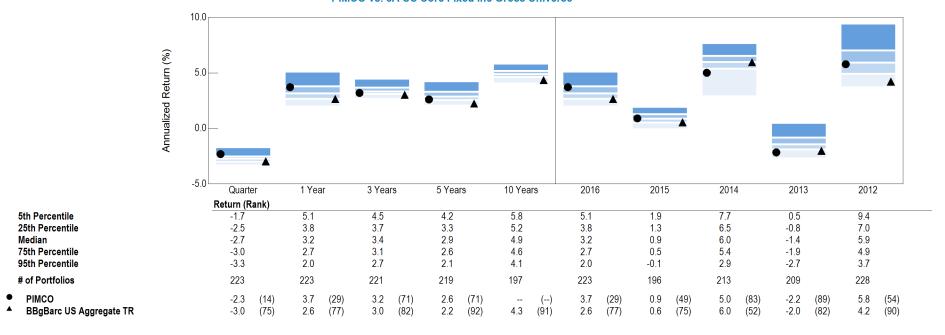




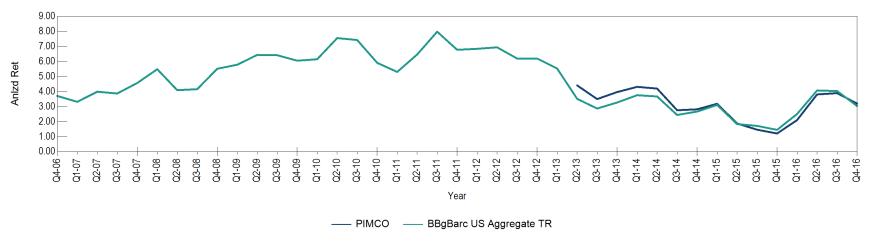
Rolling Annualized Excess Performance



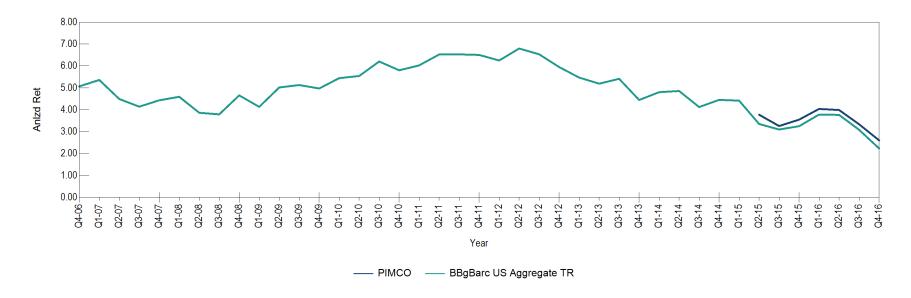
PIMCO vs. eA US Core Fixed Inc Gross Universe

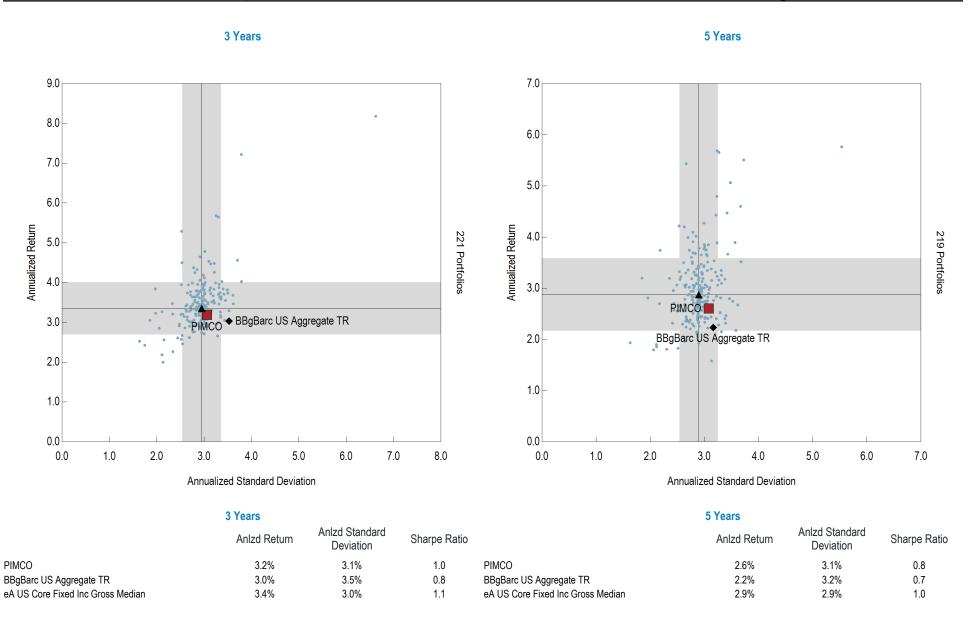


Rolling 3 Year Annualized Return (%)



Rolling 5 Year Annualized Return (%)





Performance Return Calculations

Returns calculated in the performance summary tables are time-weighted rates of return (TWRR). TWRR are calculated from changes in monthly market values, adjusted for weighted cash flows between months. Our performance methodology assumes that cash flows occur at the end of day for modified dietz calculations. Returns are linked geometrically and annualized for periods longer than one year.

Data Source

Verus is an independent third party consulting firm and calculates returns from best source book of record data. Returns calculated by Verus may deviate from those shown by the manager in part, but not limited to, differences in prices and market values reported by the custodian and manager, as well as significant cash flows into or out of an account. It is the responsibility of the manager and custodian to provide insight into the pricing methodologies and any difference in valuation.

Illiquid Alternatives

Closed end funds including but not limited to Real Estate, Hedge Funds, Private Equity, and Private Credit may lag performance and market value data due to delayed reporting. Verus will show market values for closed end funds as of the most recent reported performance adjusted for capital calls and distributions. Closed end fund managers report performance using an internal rate of return (IRR), which differs from the TWRR calculation done by Verus. It is inappropriate to compare IRR and TWRR to each other. IRR figures reported in the illiquid alternative pages are provided by the respective managers, and Verus has not made any attempts to verify these returns. Until a partnership is liquidated (typically over 10-12 years), the IRR is only an interim estimated return. The actual IRR performance of any LP is not known until the final liquidation.

Manager Line Up					
<u>Manager</u>	Fund Incepted	Data Source	<u>Manager</u>	Fund Incepted	Data Source
Mellon S&P 500	04/30/2003	Mellon	Prime Property Fund	09/30/2015	Prime Property
BlackRock Russell 1000 Growth	06/30/2010	BlackRock	American Strategic Value Realty	12/31/2014	American Realty
Jackson Square	08/31/2006	Northern Trust	BlackRock US Real Estate	09/30/2012	BlackRock
BlackRock Russell 1000 Value	07/31/2009	BlackRock	Greenfield Gap	07/31/2014	Greenfield
Dodge & Cox - Equity	12/31/1994	Northern Trust	Invesco	02/29/2008	Mellon
Legato Capital	12/31/2008	Northern Trust	Medley Capital	05/31/2013	Medley Capital
Capital Prospects	12/31/2008	Northern Trust	Raven Capital	05/31/2013	Raven Capital
LSV Asset Mgt	08/31/2004	Northern Trust	Raven Opportunity III	07/31/2015	Raven Capital
Pyramis	04/30/2006	Northern Trust	White Oak Pinnacle	08/31/2013	White Oak
Dodge & Cox - Fixed	12/31/1994	Northern Trust	MS Infrastructure	05/31/2015	Morgan Stanley
PIMCO	05/31/2010	Northern Trust			- •

Policy & Custom Index Composition

Policy Index: 14.4% Russell 1000 Value, 11.3% Russell 1000 Growth, 4.8% S&P 500, 4.0% Russell 2000 Value, 3.7% Russell 2000 Growth, 18.0% MSCI

ACWI ex USA, 29.8% BBgBarc US Aggregate, 3.5% DJ US Select RESI, 7.5% 9% Annual, 3% CPI + 4%.

US Equity Blended: 80% Russell 1000, 20% Russell 2000.

Other Disclosures

Fiscal Year End: 6/30

Cash Account includes cash held at Northern Trust for all closed end funds.

All data prior to 6/30/2015 provided by the previous consultant.



Glossary

Allocation Effect: An attribution effect that describes the amount attributable to the managers' asset allocation decisions, relative to the benchmark.

Alpha: The excess return of a portfolio after adjusting for market risk. This excess return is attributable to the selection skill of the portfolio manager. Alpha is calculated as: Portfolio Return - [Risk-free Rate + Portfolio Beta x (Market Return - Risk-free Rate)].

Beachmark R-squared: Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R-squared, the more appropriate the benchmark is for the manager. **Beta:** A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.

Book-to-Market: The ratio of book value per share to market price per share. Growth managers typically have low book-to-market ratios while value managers typically have high book-to-market ratios. Capture Ratio: A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen (up market) or fallen (down market). The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.

Correlation: A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of -1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.

Excess Return: A measure of the difference in appreciation or depreciation in the price of an investment compared to its benchmark, over a given time period. This is usually expressed as a percentage and may be annualized over a number of years or represent a single period.

Information Ratio: A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: excess return divided by tracking error.

Interaction Effect: An attribution effect that describes the portion of active management that is contributable to the cross interaction between the allocation and selection effect. This can also be explained as an effect that cannot be easily traced to a source.

Portfolio Turnover: The percentage of a portfolio that is sold and replaced (turned over) during a given time period. Low portfolio turnover is indicative of a buy and hold strategy while high portfolio turnover implies a more active form of management.

Price-to-Earnings Ratio (P/E): Also called the earnings multiplier, it is calculated by dividing the price of a company's stock into earnings per share. Growth managers typically hold stocks with high price-to-earnings ratios whereas value managers hold stocks with low price-to-earnings ratios.

R-Squared: Also called the coefficient of determination, it measures the amount of variation in one variable explained by variations in another, i.e., the goodness of fit to a benchmark. In the case of investments, the term is used to explain the amount of variation in a security or portfolio explained by movements in the market or the portfolio's benchmark.

Selection Effect: An attribution effect that describes the amount attributable to the managers' stock selection decisions, relative to the benchmark.

Sharpe Ratio: A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as: Portfolio Excess Return / Portfolio Standard Deviation.

Sortino Ratio: Measures the risk-adjusted return of an investment, portfolio, or strategy. It is a modification of the Sharpe Ratio, but penalizes only those returns falling below a specified benchmark. The Sortino Ratio uses downside deviation in the denominator rather than standard deviation, like the Sharpe Ratio.

Standard Deviation: A measure of volatility, or risk, inherent in a security or portfolio. The standard deviation of a series is a measure of the extent to which observations in the series differ from the arithmetic mean of the series. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two-thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.

Style Analysis: A return based analysis designed to identify combinations of passive investments to closely replicate the performance of funds

Style Map: A specialized form or scatter plot chart typically used to show where a Manager lies in relation to a set of style indices on a two-dimensional plane. This is simply a way of viewing the asset loadings in a different context. The coordinates are calculated by rescaling the asset loadings to range from -1 to 1 on each axis and are dependent on the Style Indices comprising the Map.

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Stanislaus County Employees' Retirement Association

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March 28, 2017

Retirement Board Agenda Item

TO: Retirement Board

FROM: Rick Santos, Executive Director

I. SUBJECT: 2016 Actuarial Valuation

II. ITEM NUMBER: 9.a

III. ITEM TYPE: Discussion and Action

IV. STAFF RECOMMENDATION: Accept the June 30, 2016 Final Actuarial Valuation as Presented

V. ANALYSIS: In February, Cheiron presented the preliminary 2016 Actuarial Valuation results. At that time, the Board sent the actuary back to finalize the valuation with no significant changes to the results. However, the actuaries did make some changes to the valuation report and slight modifications to methodologies based on feedback from Bartel Associates, StanCERA's auditing actuary.

This June 30, 2016 Actuarial Valuation contains these modifications and is presented today for final approval. The June 30, 2016 Actuarial Valuation sets employer and employee rates for fiscal year 2017-2018 and the funded status of the plan as of June 30, 2016.

VI. RISK: None

VII. STRATEGIC PLAN: Strategic Objective IV: Refine StanCERA's business and policy practices in ways that enhance stakeholder awareness, the delivery of member services and the ability of the Organization to administer the System effectively and efficiently.

VIII. ADMINISTRATIVE BUDGET IMPACT: None

Rick Santos, Executive Director

Kathy Herman, Fiscal Services Manager



Stanislaus County Employees' Retirement Association

Actuarial Valuation as of June 30, 2016

Produced by Cheiron

March 2017

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
Letter of Tran	nsmittal	i
Foreword		ii
Section I	Executive Summary	1
Section II	Assets	15
Section III	Liabilities	23
Section IV	Contributions.	27
Section V	Required CAFR Exhibits	34
<u>Appendices</u>		
Appendix A	Membership Information	37
Appendix B	Statement of Current Actuarial Assumptions and Methods	56
Appendix C	Summary of Plan Provisions	67
Appendix D	Glossary	77
Appendix E	Member Contribution Rates.	79





March 20, 2017

Board of Retirement Stanislaus County Employees' Retirement Association 832 12th Street, Suite 600 Modesto, CA 95353

Dear Members of the Board:

At your request, we have conducted an actuarial valuation of the Stanislaus County Employees' Retirement Association (StanCERA, the Fund, the Plan) as of June 30, 2016. This report contains information on the Plan's assets and liabilities. This report also discloses employer contribution levels and required disclosures for the Plan's CAFR. Your attention is called to the Foreword in which we refer to the general approach employed in the preparation of this report.

The purpose of this report is to present the results of the annual actuarial valuation of StanCERA. This report is for the use of StanCERA and its auditors in preparing financial reports in accordance with applicable law and accounting requirements. Any other user of this report is not an intended user and is considered a third party.

Cheiron's report was prepared solely for StanCERA for the purposes described herein, except that the Plan auditor may rely on this report solely for the purpose of completing an audit related to the matters herein. It is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

Sincerely, Cheiron

Graham A. Schmidt, ASA, EA, FCA, MAAA Consulting Actuary

Jonathan Chipko, FSA, FCA, EA, MAAA Consulting Actuary

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FOREWORD

Cheiron has performed the actuarial valuation of the Stanislaus County Employees' Retirement Association as of June 30, 2016. The valuation is organized as follows:

- In Section I, the **Executive Summary**, we describe the purpose of an actuarial valuation, summarize the key results found in this valuation, and disclose important trends;
- The **Main Body** of the report presents details on the Plan's
 - Section II Assets
 - Section III Liabilities
 - Section IV- Contributions
 - o Section V- Required CAFR Exhibits
- In the **Appendices** we conclude our report with detailed information describing Plan membership (Appendix A), actuarial assumptions and methods employed in the valuation (Appendix B), a summary of pertinent Plan provisions (Appendix C), a glossary of key actuarial terms (Appendix D), and tables containing member contribution rates (Appendix E).

The results of this report rely on future Plan experience conforming to the underlying assumptions. To the extent that actual Plan experience deviates from the underlying assumptions, the results would vary accordingly.

In preparing our report, we relied on information (some oral and some written) supplied by the StanCERA staff. This information includes, but is not limited to, Plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice #23.



SECTION I – EXECUTIVE SUMMARY

The primary purpose of the actuarial valuation and this report is to measure, describe, and identify the following as of the valuation date:

- The funded status of the Plan,
- Past and expected trends in the funding progress of the Plan, and
- Employer and employee contribution rates for Plan Year 2017-2018.

In the balance of this Executive Summary, we present (A) the basis upon which this year's valuation was completed, (B) the key findings of this valuation including a summary of all key results, (C) an examination of the historical trends, and (D) the projected outlook for the Plan.

A. Valuation Basis

This valuation determines the employer contributions required for the employers' fiscal years beginning July 1, 2017. The employers include the County of Stanislaus and related employers, the City of Ceres, and other participating Special Districts.

The Plan's funding policy is to collect contributions from the employers and employees equal to the sum of:

- The Normal Cost under the Entry Age Normal Cost Method,
- Amortization of the Unfunded Actuarial Liability (UAL), and
- The Fund's expected administrative expenses.

The UAL payment is determined as the amount needed to fund the outstanding UAL as of June 30, 2016 over a period of 20 years as a level percentage of pay.

This valuation was prepared based on the Plan provisions shown in Appendix C.

Actuarial experience studies are performed every three years. This valuation was performed based on the economic and demographic assumptions that were determined in the Actuarial Experience Study performed by Cheiron as of June 30, 2015 and adopted by the Board on March 16, 2016. This valuation is the second to use the assumptions determined in the above experience study. A summary of the assumptions and methods used in the current valuation is shown in Appendix B.



SECTION I – EXECUTIVE SUMMARY

B. Key Findings of this Valuation

The key results of the June 30, 2016 actuarial valuation are as follows:

- The actuarially determined employer contribution rate increased from 24.99% of payroll to 29.01% of payroll for the current valuation, reflecting the second year of a three-year phase-in of the impact of changes to the economic and demographic assumptions first adopted for the June 30, 2015 actuarial valuation. Without the phase-in, the employer contribution rate would have increased to 31.95% of payroll for the current valuation.
- The Plan's funded ratio, the ratio of Actuarial Assets over Actuarial Liability, decreased from 73.7% to 72.8%. Likewise, the Plan's funded ratio on a market value basis decreased from 75.8% to 69.1%.
- The Unfunded Actuarial Liability (UAL) is the excess of the Plan's Actuarial Liability over the Actuarial Value of Assets. The Plan experienced an increase in the UAL from \$627.9 million to \$691.3 million as of June 30, 2016. This increase in UAL was due to liability and investment losses along with a contribution shortfall.
- During the year ending June 30, 2016, the return on Plan assets was -1.7% on a market value basis net of investment (but not administrative) expenses, as compared to the 7.25% assumption. The Actuarial Value of Assets recognizes 20% of the difference between the expected and actual return on the Market Value of Assets (MVA). This method of smoothing the asset gains and losses returned 6.3% on the smoothed value of assets, an actuarial asset loss of \$16.3 million. The relatively small loss in the Actuarial Value of Assets reflected the continued recognition of past investment gains which partially offset the lower market return this year.
- During the 2015-16 Plan Year, the actuarial liabilities of the Plan increased more than expected, largely due to salary and COLA increases higher than expected. These and other unexpected changes resulted in a liability loss of \$28.2 million.
- Changes to the valuation software programing due to recommendations from the Actuarial Audit increased liabilities by \$0.7 million.
- Overall participant membership increased compared to last year. There were 519 new hires and rehires during 2015-2016 and the total active population increased from 4,144 to 4,248, or 2.5%. Total projected payroll increased from \$249,704,758 to \$263,395,718, or 5.5%.
- The Actuarial Experience Study as of June 30, 2015 recommended changes to many of the
 actuarial assumptions used in this valuation. The Retirement Board adopted these changes for
 the June 30, 2015 valuation. The Retirement Board decided to implement a three-year phasein of the impact of these changes on the employer contribution rates. For this valuation, the



SECTION I – EXECUTIVE SUMMARY

phase-in is in its second year. The schedule of required employer contributions with and without the phase-in is shown in Table I-1.

Table I-1 Development of Phased Employer Contributions						
	Full Phased					
Plan Year	Contribution	Contribution				
2016-17	30.9%	25.0%				
2017-18	31.9%	29.0%				
2018-19	31.9%	32.4%				
2019-20	32.3%	33.0%				

The net impact of the phase-in is to reduce the employer contribution rate by about 5.9% and 2.9% from what it would have been without phase-in for 2016-17 and 2017-18, respectively. The employer contribution rate is fully phased-in by the 2018-19 plan year, when the rate is 0.5% higher than it would have been without the phase-in. This is followed by contributions higher than they would have been without phase-in by approximately 0.7% of pay in the years 2019-20 and later. The phase-in of rate increases is consistent with practices described by the California Actuarial Advisory Panel (CAAP), as well as other actuarial organizations.

In Tables I-2 and I-3, we summarize the key results of the valuation with respect to assets and liabilities, contribution and membership. We also include the employer contribution rate after the impact of the second year of the three-year phase-in. The results are presented and compared for both the current and prior Plan year.



SECTION I – EXECUTIVE SUMMARY

Table I-2 Stanislaus County Employees' Retirement Association Summary of Key Valuation Results (in millions)						
Valuation Date	Jun		Jı	ine 30, 2016		
Fiscal Year End	_	2017	.	2018		
Actuarial Liability	\$	2,391.5		2,537.1		
Actuarial Value of Assets ¹	\$	1,763.6	\$	1,845.8		
Unfunded Actuarial Liability (Actuarial Value	\$	627.9	\$	691.3		
Funding Ratio (Actuarial Value)		73.7%		72.8%		
Market Value of Assets ¹	\$	1,812.6	\$	1,752.7		
Unfunded Actuarial Liability (Market Value)	\$	578.9	\$	784.3		
Funding Ratio (Market Value)		75.8%		69.1%		
Net Employer Contribution Rate ²		30.86%		31.95%		
Employer Contribution Rate after Phase-In		24.99%		29.01%		

¹ Net of non-valuation reserves.

² Prior to phase in of the assumption change.

Table I-3 Membership Total								
Item	Jı	une 30, 2015	J	une 30, 2016	% Change			
Actives		4,144		4,248	2.5%			
Current Inactives		979		1,030	5.2%			
Retired Members		3,539		3,651	<u>3.2%</u>			
Total Members		8,662		8,929	3.1%			
Ratio of Retired Members to Active Members		85.4%		85.9%				
Active Member Payroll (FYE 2016/2017)	\$	249,704,758	\$	263,395,718	5.5%			
Average Pay per Active	\$	60,257	\$	62,005	2.9%			

The ratio of retired members to active members is a measure of the maturity of the plan. It shows how many retirees are supported by each active member. A higher ratio indicates a more mature plan and potentially higher risk since the retiree benefits are larger relative to the contribution base, i.e. the active member payroll. Table I-3 shows that the ratio of retired members to active members continues to increase, indicating the ongoing maturation of the Plan.



SECTION I – EXECUTIVE SUMMARY

Assets and Liabilities

Table I-4 presents a comparison between the June 30, 2015 and June 30, 2016 StanCERA assets, liabilities, Unfunded Actuarial Liability, and funding ratios, both on a market and smoothed basis.

Table I-4 Assets & Liabilities (in millions)							
Item	Jun	e 30, 2015	Jun	e 30, 2016	% Change		
Actuarial Liability							
Actives	\$	939.3	\$	975.7	3.9%		
Current Inactives		114.4		134.2	17.3%		
Retired Members		1,337.8		1,427.2	<u>6.7%</u>		
Total Actuarial Liability	\$	2,391.5	\$	2,537.1	6.1%		
Market Value of Assets (MVA)	\$	1,812.6	\$	1,752.7	-3.3%		
Actuarial Value of Assets (AVA)	\$	1,763.6	\$	1,845.8	4.7%		
Unfunded Actuarial Liability - MVA	\$	578.9	\$	784.4	35.5%		
Unfunded Actuarial Liability - AVA	\$	627.9	\$	691.3	10.1%		
Funding Ratio - MVA		75.8%		69.1%	-6.7%		
Funding Ratio - AVA		73.7%		72.8%	-0.9%		

Table I-4 indicates that the Actuarial Liability increased by 6.1% and the Actuarial Value of Assets increased by 4.7%, resulting in a decrease in the funding ratio from 73.7% as of June 30, 2015 to 72.8% as of June 30, 2016. The increase in Actuarial Liability and accompanying decrease in the funded status is primarily due to the investment and liability losses, along with a contribution shortfall. StanCERA employs a commonly used actuarial smoothing method on the market value that dampens market volatility. The Actuarial Value of Assets increased while the market value decreased because of the impact of deferred investment gains from prior years. The funding ratio measured on a Market Value of Assets basis was 69.1% as of June 30, 2016.

Section II provides additional information explaining the development of the Actuarial Value of Assets.



SECTION I – EXECUTIVE SUMMARY

Changes in UAL

The Unfunded Actuarial Liability (UAL) for StanCERA increased by \$63.4 million, from \$627.9 million to \$691.3 million. Table I-5 below presents the specific components of the change in the UAL.

As noted above, the return on the actuarial assets used to compute the UAL and the employer contribution rate was 6.3% during the 2015-16 Plan Year. Investment returns lower than the assumed rate of 7.25% increased the UAL by \$16.3 million.

Liability losses increased the UAL by \$28.2 million, mainly due to salary and COLA increases higher than expected.

Changes in the valuation software programing related to recommendations from the actuarial audit conducted by Bartel Associates increased the UAL by \$0.7 million.

The UAL also increased by \$18.3 million due to contributions smaller than the actuarially determined amount. This is a result of the 12-month lag in the implementation of contribution rates.

The expected change in the UAL due to the yearly amortization of the UAL balance – a decrease of \$0.1 million, as a result of the amortization schedule for the current year – combined with the above UAL changes to produce an overall increase of \$63.4 million.

	Table I-5 Increase in Unfunded Actuarial Liability		
	Experience	in i	millions
1.	Unfunded actuarial liability, 6/30/2015	\$	627.9
2		Φ.	(0.1)
2.	Expected change in unfunded actuarial liability	\$	(0.1)
3.	Unfunded increase due to investment loss		16.3
4.	Unfunded increase due to contribution shortfall		18.3
5.	Unfunded increase due to liability loss		28.2
7.	Unfunded change due to audit update		0.7
8.	Total change in unfunded actuarial liability	\$	63.4
9.	Unfunded actuarial liability, 6/30/2016	\$	691.3



SECTION I – EXECUTIVE SUMMARY

Changes in Employer Contributions

Thus far, the experience of the 2015-16 Plan year has been presented in terms of the UAL and funded ratio. Table I-6 below summarizes the impact of actuarial experience and changes in assumptions on the employer contribution rate.

Tab	ole I-6							
Employer Contribution Reconciliation								
		Normal		Admin				
Item	Total	Cost	Amortization	Expense				
FYE 2017 Net Employer Contribution Rate	30.86%	12.24%	17.66%	0.96%				
Change Due to Asset Loss	0.46%	0.00%	0.46%	0.00%				
Change Due to Contribution Shortfall	0.52%	0.00%	0.52%	0.00%				
Change Due to Demographic Losses	0.50%	-0.29%	0.79%	0.00%				
Change Due to Effect of Payroll on Amortization	-0.43%	0.00%	-0.41%	-0.02%				
Change Due to Audit Updates	0.04%	0.02%	0.02%	0.00%				
FYE 2018 Net Employer Contribution Rate - Full	31.95%	11.97%	19.04%	0.94%				
Impact of Phase-in	-2.94%	-0.43%	-2.47%	-0.03%				
FYE 2018 Net Employer Contribution Rate - Phased	29.01%	11.54%	16.57%	0.91%				

A review of the changes in the employer contribution rate from the prior valuation reveals that Plan experience during the year – including demographic and salary changes, as well as asset experience – resulted in a net increase in the employer contribution rate of 1.09% of pay before phase-in of the past changes in the actuarial assumptions are taken into account:

• Asset experience produced an investment loss on a smoothed basis, as described earlier. The smoothed loss increased the contribution rate by 0.46% of pay.

The ratio of actuarial to Market Value of Assets is 105.3%. There are now \$93 million in net deferred losses as of June 30, 2016, as well as nearly \$18 million in a non-valuation Contingency Reserve.

- The Plan received a smaller contribution than the actuarially determined amount. The net impact of the shortfall was an increase in the cost by 0.52% of pay.
- The demographic experience of the Plan rates of retirement, death, disability, and termination, as well as salary and COLA changes caused an increase in cost. Higher than expected Cost of Living Adjustments (COLAs) for current retirees contributed to an increase in the Unfunded Actuarial Liability and the associated amortization payment, as well as salary experience, new entrants and losses associated with new retirees. The



SECTION I – EXECUTIVE SUMMARY

increase in the amortization payment was partially offset by a reduction in the employerpaid Normal Cost as a result of the continued transition of the active workforce to membership in the new PEPRA tiers, which reflect lower benefit levels for new hires.

- Overall payroll was greater than expected by about \$5.6 million. As a result, the unfunded liability amortization payment and administrative expenses were spread over a larger payroll base than expected, and the employer contribution rate decreased by 0.43% of pay.
- The impact of updates to actuarial software coding following the actuarial audit performed by Bartel Associates increased the cost by 0.04% of pay.
- The impact of the change in assumptions due to the experience study performed last year is to be phased-in over three years, as indicated by table I-1. For this valuation, the phase-in is in its second year and reduces the contribution rate by 2.94%.

Plan Risk

Table I-7 shows the ratio of assets to active member payroll for StanCERA.

ine 30, 2016
\$ 263,395,718
\$ 1,752,728,030
6.65
9.63
\$

One of the most important measures of a plan's risk is the ratio of plan assets to payroll. The table above shows StanCERA's assets as a percentage of active member payroll. This ratio indicates the sensitivity of the Plan to the returns earned on Plan assets.

We note in the table that Plan assets currently are 6.7 times covered payroll for the Plan; as a point of reference, the average asset-to-payroll ratio for the '37 Act systems as a whole is currently around 7.0. As funding improves and the Plan reaches 100% funding, the ratio of asset to payroll will increase past nine times payroll, perhaps higher depending on the Plan's future demographic makeup.

To appreciate the impact of the ratio of assets to payroll on plan cost, consider the situation for a new plan with almost no assets. Even if the assets suffer a bad year of investment returns, the impact on the plan cost is nil, because the assets are so small.



SECTION I – EXECUTIVE SUMMARY

On the other hand, consider the situation for StanCERA. Suppose StanCERA's assets lose 10% of their value in a year. Since they are assumed to earn 7.25%, there is an actuarial loss of 17.25% of Plan assets. Based on the current ratio of asset to payroll (665%), that means the loss in assets is about 115% of active payroll (665% of the 17.25% loss). There is only one source of funding to make up for this loss: the employers. Consequently, barring future offsetting investment gains, the employer has to make up the asset loss in future contributions. In this example of a one-year loss of 10%, this shortfall will eventually require an additional annual amortization payment in the vicinity of 8.33% of payroll if amortized over 20 years.

As the Plan matures and becomes better funded, the ratio of asset to payroll will increase. When assets are 963% of pay, the 10% loss discussed above will translate to a loss of over 166% of payroll, which when amortized over 20 years will increase the employer contribution by 12.05% of member pay. Therefore, the Plan is likely to become significantly more sensitive to market variation in the future than it is today.

C. Historical Trends

Despite the fact that for most retirement plans the greatest attention is given to the current valuation results and in particular, the size of the current Unfunded Actuarial Liability and the employer contribution, it is important to remember that each valuation is merely a snapshot in the long-term progress of a pension fund. It is more important to judge a current year's valuation result relative to historical trends, as well as trends expected into the future.



SECTION I – EXECUTIVE SUMMARY

Assets and Liabilities

The chart compares the Market Value of Assets (MVA) and Actuarial Value of Assets (AVA) to the Actuarial Liabilities. The percentage shown in the table below the graph is the ratio of the Actuarial Value of Assets to the Actuarial Liability (the funded ratio). The funded ratio has decreased from 76.3% in 2010 to 72.8% as of June 30, 2016. The drop in the funded ratio in 2015 was primarily due to changes in assumptions. The funded ratio has decreased from the 73.7% of last year because of liability and investment losses along with a contribution shortfall.

Assets and Liabilities Actuarial Liability **→** Assets-Smoothed --- Assets at Market Value 3.0 2.5 2.0 Billions 1.5 1.0 0.5 0.0 2010 2011 2012 2013 2014 2015 2016 **Valuation Year** 2010 2011 2012 2013 2014 2015 2016 **Funded Ratio** 76.3% **78.1%** 76.9% **79.4%** 73.7% 72.8% 81.1% **UAL** (Billions) \$ 0.41 \$ 0.39 \$ 0.44 \$ 0.40 \$ 0.38 \$ 0.63 \$ 0.69

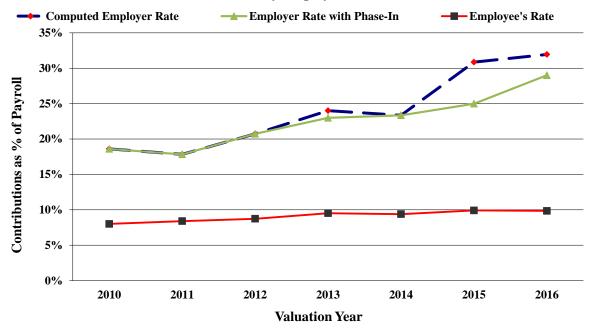


SECTION I – EXECUTIVE SUMMARY

Contribution Trends

In the chart, we present the historical trends for the StanCERA contribution rates. The employer contribution rates have risen since 2010 as result of the investment losses from 2008-2009, compounded by demographic losses and changes to the actuarial assumptions and methods. The impact of these changes was offset to some extent by an extension to the amortization period. The average employee contribution rates have also increased as the Plan's economic and demographic assumptions have changed.

Stanislaus County Employees' Retirement Association





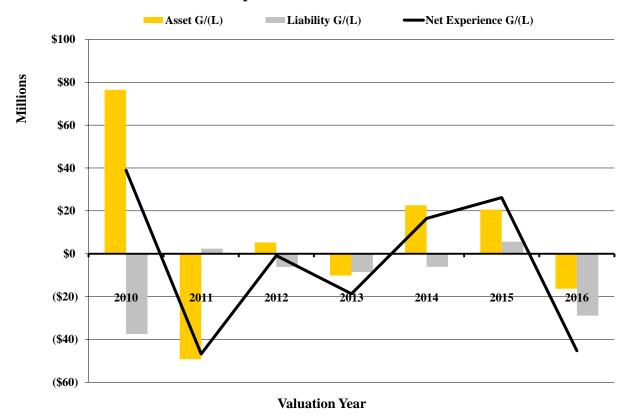
SECTION I – EXECUTIVE SUMMARY

Gains and Losses

The following chart for StanCERA presents the pattern of annual gains and losses, broken into the investment and liability components. The investment gains and losses represent the changes on a smoothed basis (i.e. based on the Actuarial Value of Assets). The chart does not include any changes in StanCERA's assets and liabilities attributable to changes to actuarial methods, procedures or assumptions or Plan benefit changes.

The investment gain in 2009-2010 was by far the most significant gain or loss during the last seven years, although a substantial loss also occurred in 2010-2011. The Plan experienced a substantial liability loss in 2010. The Plan experienced more modest gains and losses from the 2011-2012 through 2014-2015. In 2015-2016, the Plan experienced the largest investment and liability losses in five years.

Experience Gains and Losses





SECTION I – EXECUTIVE SUMMARY

D. Future Expected Financial Trends

The analysis of projected financial trends is an important component of this valuation. In this Section, we present our assessment of the implications of the June 30, 2016 valuation results in terms of benefit security (assets over liabilities). All the projections in this section are based on the current investment return assumption of 7.25%. We have assumed future total payroll increases of 3.25% per year.

The graph shows the expected employer and employee contribution rates based on achieving the 7.25% assumption **each year** for the next 20 years. This scenario is highly unlikely: even if the Plan does achieve an **average** return of 7.25% over this time period, the returns in each given year will certainly vary. The graph reflects the phase-in of the impact of the assumption change. The expected total contribution rates based on the prior year valuation as of June 30, 2015 are shown (in the dashed line) for comparison.

The contribution rate graph shows that employer contribution rates are expected to increase for the next four years, as the impact of assumption changes are phased-in and this year's market value investment losses are recognized. After 2020, the expected rates stay relatively stable until current unfunded liability amortization period (20 years) ends.

50% 45% 45% 40% 32.4% 33.0% 34.3% 35.3% 35.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 33.9% 33.8% 33.7% 33.5% 33.4% 33.2% 35.0% 34.8% 34.7% 34.5% 34.4% 34.2% 34.1% 34.0% 34

Projection of Contributions, 7.25% Return Each Year

The total contribution rate (employer plus employee) is approximately 39% of member payroll for the June 30, 2016 valuation; it is expected to increase over the next four years to approximately 45% and then decline to approximately 42% if all actuarial assumptions are met. The gradual decline is due to the expected hiring of new PEPRA members to replace the legacy employees as they retire, thus lowering the average normal cost of the Plan.

After 20 years, the employer contribution rate is expected to drop due to the end of the current unfunded liability amortization period, to a level around 10% of pay, representing the expected Normal Cost plus administrative expenses.



SECTION I – EXECUTIVE SUMMARY

Asset and Liability Projections:

The graph shows the projection of assets and liabilities assuming that assets will earn the 7.25% assumption each year during the projection period. The funded ratio shown is based on Actuarial Value of Assets.

Projection of Assets And Liabilities, 7.25% Return Each Year (\$ millions)



The graph above shows that the projected funded status increases over the next 20 years to gradually approach 100%, as can be expected based on the amortization policy, assuming the actuarial assumptions are achieved.

However, as above, it is the **actual** return on Plan assets that will determine the future funding status and contribution rate to the Fund. The Actuarial Value of Assets is greater than the Market Value of Assets as of June 30, 2016, and the two are assumed to be equal past 2020.



SECTION II — ASSETS

Pension Plan assets play a key role in the financial operation of the Plan and in the decisions the Board may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact benefit levels, employer contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on Plan assets including:

- **Disclosure** of Plan assets as of June 30, 2015 and June 30, 2016,
- Statement of the **changes** in market values during the year,
- Development of the Actuarial Value of Assets,
- An assessment of historical investment performance versus inflation, and
- An allocation of the unfunded liability between the **valuation subgroups**.

Disclosure

There are two types of asset values disclosed in the valuation, the Market Value of Assets, and the Actuarial Value of Assets. The market value represents "snap-shot" or "cash-out" values, which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are usually not as suitable for long-range planning as are the Actuarial Value of Assets which reflect smoothing of annual investment returns.

Table II-1 on the next page discloses and compares each asset class as of June 30, 2015 and June 30, 2016.



SECTION II — ASSETS

Statement	Table II	-1 t Market Value			
Statement of		cal Year ending	Fis	cal Year ending	
Assets		June 30, 2015	June 30, 2016		
Cash and Cash Equivalents	\$	71,553,166	\$	55,503,333	
Total Cash and Cash Equivalents	\$	71,553,166	\$	55,503,333	
Receivables					
Interest and Dividends	\$	6,057,937	\$	7,165,933	
Contributions		3,703,589		4,516,013	
Securities Transactions		34,794,799		47,333,635	
Total Receivables	\$	44,556,325	\$	59,015,581	
Fixed Assets					
Capitalized Software	\$	222,653	\$	97,028	
Real Estate Occupied		1,707,899		1,688,922	
Real Estate Leased		1,138,825		1,126,171	
Other		438,357		446,502	
Total Fixed Assets	\$	3,507,734	\$	3,358,623	
Investments at Market Value					
Fixed Income	\$	453,889,853	\$	523,222,780	
Equities		1,194,717,298		1,068,159,217	
Collateral on Loaned Securities		194,948,321		196,552,545	
Other		127,745,699		144,572,623	
Total Investments	\$	1,971,301,171	\$	1,932,507,165	
Liabilities					
Accounts Payable	\$	(9,951,045)	\$	(10,429,303)	
Security Transactions Payable		(52,845,683)		(69,993,618)	
Collateral Held for Loaned Securities		(194,948,321)		(196,552,545)	
Other		(569,143)		(495,523)	
Total Liabilities	\$	(258,314,192)	\$	(277,470,989)	
Market Value of Assets	\$	1,832,604,204	\$	1,772,913,713	



SECTION II — ASSETS

Changes in Market Value

The components of asset change are:

- Contributions (employers and employee)
- Benefit payments
- Expenses (investment and administrative)
- Investment income (realized and unrealized)

Table II-2 on the next page shows the components of change in the Market Value of Assets during the fiscal years ending June 30, 2015 and June 30, 2016.



SECTION II — ASSETS

Ta	ble II-2			
Changes in				
	Fi	iscal Year ending	Fiscal Year end	
Additions		<u>June 30, 2015</u>		<u>June 30, 2016</u>
Contributions				
Employer's Contribution	\$	53,849,031	\$	58,196,310
Members' Contributions		22,960,235		23,916,508
Total Contributions	\$	76,809,266	\$	82,112,818
Net Investment Income				
Net Appreciation/(Depreciation) in				
Fair Value of Investments	\$	32,674,635	\$	(70,114,702)
Interest and Dividends		43,216,684		47,206,807
Commission Recapture		45,354		46,825
Other Investment Income		141,801		197,502
Total Investment Income	\$	76,078,474	\$	(22,663,568)
Investment Expense	•	(7,856,505)		(9,440,764)
Net Investment Income	\$	68,221,969	\$	(32,104,332)
Securities Lending Activities				
Securities Lending Income	\$	714,891	\$	1,116,644
Expenses from Securities Lending Activities		(214,079)	·	(334,588)
Net Securities Lending Income		500,812		782,056
Total Net Investment Income	\$	68,722,781	\$	(31,322,276)
Total Additions	\$	145,532,047	\$	50,790,542
Deductions				
Benefits	\$	100,099,055	\$	106,946,768
Refunds		1,759,101		1,219,042
Administrative Costs		2,378,966		2,315,223
Total Deductions	\$	104,237,122	\$	110,481,033
Net Increase/(Decrease)	\$	41,294,925	\$	(59,690,491)
Net Assets Beginning of Year	\$	1,791,309,279	\$	1,832,604,204
Net Assets End of Year	\$	1,832,604,204	\$	1,772,913,713
Approximate Return		3.87%		-1.72%



SECTION II — ASSETS

Actuarial Value of Assets (AVA)

The Actuarial Value of Assets represents a "smoothed" value developed by the actuary to reduce the volatile results which could develop due to short-term fluctuations in the Market Value of Assets. For this Plan, the Actuarial Value of Assets is calculated on a modified market-related value. The Market Value of Assets is adjusted to recognize, over a five-year period, investment earnings which are greater than (or less than) the assumed investment return. However, in no event will the Actuarial Value of Assets be less than 80% or more than 120% of market value on the valuation date.

The Valuation Assets are the portion of the Actuarial Assets dedicated to funding the basic pension benefits. The Valuation Assets exclude the value of any non-valuation reserves, such as reserves established for legal contingencies. The Valuation Assets also exclude the value of any non-valuation contingency reserves, which have been established according to the Board's funding policy. In valuations prior to the June 30, 2014 valuation, a reserve associated with the Burial Allowance was excluded from the Valuation Assets; both the assets and liabilities associated with this benefit are included in this valuation.

The table on the following page shows the development of the Actuarial Asset and Valuation Assets values.



SECTION II — ASSETS

	Table II-3						
	Development of Actuarial Value of Assets for 6/3 Item)U/ 2 U1	o Total				
1.	Market Value as of 6/30/2015	\$	1,832,604,204				
2.	Non-Investment Cash Flow for 2015-2016		(28,368,215)				
3.	Expected Return in 2015-2016		131,853,449				
4.	Expected Market Value as of $6/30/2016$: $(1+2+3)$	\$	1,936,089,438				
5.	Actual Return in 2015-2016		(31,322,276)				
6.	Actual Return Above Expected in 2015-2016: (5 - 3)		(163,175,725)				
7.	Market Value as of 6/30/2016	\$	1,772,913,713				
8.	Deferred Recognition of Returns Above Expected						
	a. 2015-2016 (80% of -\$163,175,725)		(130,540,580)				
	b. 2014-2015 (60% of -\$69,060,690)		(41,436,414)				
	c. 2013-2014 (40% of \$156,253,060)		62,501,224				
	d. 2012-2013 (20% of \$81,607,988)		16,321,598				
	e. Total	\$	(93,154,172)				
9.	Preliminary Actuarial Value of Assets: (7 - 8e)	\$	1,866,067,885				
10.	Corridor Limit a. 80% of Net Market Value b. 120% of Net Market Value		1,418,330,970 2,127,496,456				
	Actuarial Value after Corridor as of 6/30/2016 Rate of Return on Actuarial Value of Assets	\$	1,866,067,885 6.27%				
13.	Ratio of Actuarial Value to Market Value: (11 ÷ 7)		105.3%				
14.	Special (Non Valuation) Reserves: a. Health Insurance Reserves b. Special COL Reserve c. Legal Contingency Reserve d. Tier 3 Disability Reserve e. Contingency Reserve f. Total Special Reserves (Market Value)	\$	0 0 2,238,799 1,560 17,945,324 20,185,683				
15.	Adjusted Total Special Reserves (105.3% of Market, Except Contingency)	\$	20,303,398				
16.	Pension Reserves at Actuarial Value (Valuation Assets): (11 - 15)	\$	1,845,764,487				



SECTION II — ASSETS

Historical Investment Performance

The table shows the historical annual asset returns on a Market Value, Actuarial Value, and Valuation Asset basis, as well in the increase in the Consumer Price Index (CPI) since 1997. Note that the returns prior to 2013 are expressed net of investment and administrative expenses; the returns for 2013 (and future years) are expressed net of investment expenses only.

Table II-4 Net Return on Assets vs. Increase in Consumer Price Index				
Year Ended June 30	Net Return at Market Value	Net Return at Actuarial Value	Net Return at Valuation Assets	Increase in Consumer Price Index ¹
1997	20.4%			2.3%
1998	13.4%			1.7%
1999	10.6%			2.0%
2000	6.3%			3.7%
2001	7.0%			3.2%
2002	-4.5%			1.1%
2003	5.2%		4.9%	2.1%
2004	6.1%		6.3%	3.3%
2005	8.2%		5.5%	2.5%
2006	9.9%		10.8%	4.3%
2007	16.0%	10.8%	0.6%	2.7%
2008	-8.5%	8.0%	16.7%	5.0%
2009	-17.2%	-9.6%	-9.4%	-1.4%
2010	15.6%	13.0%	14.7%	1.1%
2011	22.1%	3.5%	4.2%	3.6%
2012	0.1%	6.4%	6.5%	1.7%
2013	13.9%	7.0%	7.2%	1.8%
2014	18.0%	9.4%	9.5%	2.1%
2015	3.9%	9.1%	9.0%	0.1%
2016	-1.7%	6.3%	6.3%	1.0%
0-Year Compound Average	6.8%	N/A	N/A	2.2%
5-Year Compound Average	5.3%	N/A	N/A	2.1%
10-Year Compound Average	5.5%	6.2%	6.3%	1.8%
5-Year Compound Average	6.5%	7.6%	7.7%	1.3%

¹ Based on All Urban Consumers - U.S. City Average, June indices.



SECTION II — ASSETS

Allocation of Unfunded Actuarial Liability by Valuation Subgroup

The following table shows the allocation of the Unfunded Actuarial Liability between the two valuation subgroups (County / Former County Members and City of Ceres / Special District Members). The Valuation Assets are reduced by the liability associated with the inactive members and the refundable contribution balances for active members, and the remaining assets are allocated to each subgroup based on their share of the active liability. These UAL balances are used to calculate each subgroup's amortization payment.

Table II-5 Allocation of 6/30/2016 Unfunded Liability (in thousands)												
		C	ounty and		s and Other		m 1					
		For	mer County	L	Districts		Total					
1.	Actuarial Value of Assets					\$	1,845,764					
2.	Accumulated Employee Contributions		188,048		12,911		200,960					
3.	Inactive Actuarial Liability		1,503,330		58,016		1,561,346					
4.	Net Assets for Distribution [1 - 2 - 3]		_			\$	83,459					
5.	Active Actuarial Liability	\$	911,064	\$	64,657	\$	975,721					
6.	Allocation of Remaining Assets		93.37%		6.63%		100.00%					
7.	Remaining Assets		77,928		5,530		83,459					
8.	Total Assets for Actives [2 + 7]		265,977		18,442		284,419					
9.	Active Funded Ratio [8 ÷ 5]		29.2%		28.5%		29.1%					
10.	Actuarial Value of Assets [3 + 8]	\$	1,769,307	\$	76,458	\$	1,845,764					
11.	AVA Funded Ratio $[10 \div (3+5)]$		73.3%		62.3%		72.8%					
12.	Unfunded Actuarial Liability [5 - 8]	\$	645,088	\$	46,215	\$	691,302					

Within the two valuation subgroups (County / Former County Members and City of Ceres / Special District Members), the Actuarial Value of Assets and the Unfunded Actuarial Liability are allocated between Safety and General based on Actuarial Liability. See Table III-1.



SECTION III – LIABILITIES

In this section, we present detailed information on Plan liabilities including:

- **Disclosure** of Plan liabilities at June 30, 2015 and June 30, 2016,
- Statement of **changes** in these liabilities during the year.

Disclosure

Several types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them. Note that these liabilities are not applicable for settlement purposes, including the purchase of annuities and the payment of lump sums.

- **Present Value of Future Benefits:** Used for measuring all future Plan obligations, represents the amount of money needed today to fully fund all benefits of the Plan both earned as of the valuation date and those to be earned in the future by current Plan participants, under the current Plan provisions.
- Actuarial Liability: Used for funding calculations, this liability is calculated taking
 the Present Value of Future Benefits and subtracting the present value of future
 Member Contributions and future Employer Normal Costs under an acceptable
 actuarial funding method. The method used for this Plan is called the Entry Age
 Normal (EAN) funding method.
- **Unfunded Actuarial Liability:** The excess of the Actuarial Liability over the Valuation Assets.

Table III-1 on the following page discloses each of these liabilities for the current and prior valuations. With respect to each disclosure, a subtraction of the appropriate value of Plan assets yields, for each respective type, a **net surplus** or an **Unfunded Actuarial Liability**.



SECTION III – LIABILITIES

Table III-1 Present Value of Future Benefits and Actuarial Liability (in thousands)												
				(iii tiro asaira	5)				Ju	ne 30, 2016	Ju	ne 30, 2015
	General Safety									Total		Total
	$\overline{\mathbf{C}}$	ounty and		eres and	Co	ounty and	•	eres and			_	20002
		Former		Other	Former		Other					
		County	L	Districts		County	I	Districts				
Present Value of Future Benefits												
Actives	\$	969,160	\$	41,124	\$	323,848	\$	52,382	\$	1,386,514	\$	1,333,777
Terminated Vested		90,902		4,502		31,028		7,747		134,179		114,433
Retirees		917,122		21,443		255,781		15,863		1,210,208		1,128,934
Disabled		46,999		2,186		73,301		4,949		127,435		124,026
Beneficiaries		57,625		327		30,572		1,000		89,524		84,821
Total StanCERA	\$	2,081,809	\$	69,581	\$	714,529	\$	81,941	\$	2,947,860	\$	2,785,991
Actuarial Liability												
Total Present Value of Benefits	\$	2,081,809	\$	69,581	\$	714,529	\$	81,941	\$	2,947,860	\$	2,785,991
Present Value of Future Normal Costs												
Employer Portion		150,172		6,650		60,898		10,327		228,047		257,941
Employee Portion		125,151		5,027		45,723		6,845		182,745		136,529
Actuarial Liability	\$	1,806,485	\$	57,903	\$	607,909	\$	64,769	\$	2,537,067	\$	2,391,522
Actuarial Value of Assets	\$	1,323,821	\$	36,089	\$	445,485	\$	40,368	\$	1,845,764	\$	1,763,629
Funded Ratio		73.3%		62.3%		73.3%		62.3%		72.8%		73.7%
Unfunded Actuarial Liability/(Surplus)	\$	482,664	\$	21,814	\$	162,424	\$	24,401	\$	691,302	\$	627,893



SECTION III – LIABILITIES

The table shows the Actuarial Liabilities for each of the valuation subgroups (General and Safety), split by members' status.

Table III-2 Liabilities by Group as of June 30, 2016 (in thousands)												
General Safety										Total		
		ounty and Former	d Ceres and Other			unty and Former		eres and Other				
				istricts	County			Districts				
Actuarial Liability												
Actives	\$	693,836	\$	29,446	\$	217,228	\$	35,210	\$	975,721		
Terminated Vested		90,902		4,502		31,028		7,747		134,179		
Retirees		917,122		21,443		255,781		15,863		1,210,208		
Disabled		46,999		2,186		73,301		4,949		127,435		
Beneficiaries		57,625		327		30,572		1,000		89,524		
Total	\$	1,806,485	\$	57,903	\$	607,909	\$	64,769	\$	2,537,067		



SECTION III – LIABILITIES

Changes in Liabilities

Each of the Liabilities disclosed in the prior tables are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- Plan amendments increasing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above, and also due to changes in Plan assets resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the method used to measure Plan assets

	Table III-3 Development of 2016 Experience Gain/(Loss) (in millions)		
	Item		Cost
1.	Unfunded Actuarial Liability at June 30, 2015	\$	627.9
2.	Middle of year actuarial liability payment		(44.1)
3.	Interest to end of year on 1 and 2	_	44.0
4.	Expected Unfunded Actuarial Liability at June 30, 2016 (1+2+3)	\$	627.8
5.	Actual Unfunded Liability at June 30, 2016	_	691. <u>3</u>
6.	Difference: (4 - 5)	\$	(63.5)
7.	Portion of difference due to:		
	A. Investment experience	\$	(16.3)
	B. Contribution (shortfall)/excess		(18.3)
	C. Audit changes		(0.7)
	D. New entrant loss		(2.0)
	E. Other experience		(26.2)
	F. Total		(63.5)



SECTION IV – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine what level of contributions is needed to properly maintain the funding status of the Plan. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both stable and predictable.

For this Plan, the actuarial funding method used to determine the Normal Cost and the Unfunded Actuarial Liability is the **Entry Age Normal (EAN)** cost method. There are three components to the total contribution: the **Normal Cost rate** (employee and employer), the **Unfunded Actuarial Liability rate** (UAL rate), and the **Administrative Expense** contribution.

The Normal Cost rate is determined in the following steps. First, an individual Normal Cost rate is determined by taking the value, as of entry age into the Plan, of each member's projected future benefits. This value is then divided by the value, also at entry age, of the member's expected future salary producing a Normal Cost rate that should remain relatively constant over a member's career.

The total Normal Cost is computed by adding the expected dollar amount of each active member's Normal Cost for the current year – known as the Individual Entry Age Method. The total Normal Cost is adjusted with interest to the middle of the year, to reflect the fact that the Normal Cost contributions are paid throughout the year as member payroll payments are made. Finally, the total Normal Cost rate is reduced by the member contribution rate to produce the employer Normal Cost rate. The member contribution rate for each subgroup is determined by adding the expected contributions for each member and dividing by the projected pay for each subgroup.

The EAN Actuarial Liability is calculated by subtracting the present value of future total Normal Cost from the Present Vale of Future Benefits (as described on page 23).

The Unfunded Actuarial Liability (UAL) is the difference between the EAN Actuarial Liability and the Actuarial Value of Assets. The UAL payment is determined as the amount needed to fund the UAL over a closed 20-year period as a level percentage of payroll.

Beginning with the June 30, 2012 actuarial valuation, the Board adopted a policy of adding an amount equal to the expected annual administrative expense to the employer's required contribution. Prior to the June 30, 2012 actuarial valuation, the administrative expenses were included as an offset to the assumed earnings rate, and were shared between the employees and employers. For the June 30, 2016 valuation, this amount is estimated to be \$2.472 million.

Beginning with the June 30, 2015 actuarial valuation, the Board adopted a three-year phase-in of the impact of the assumption changes on the employer contribution rate. For this valuation, the phase-in is in its second year.



SECTION IV - CONTRIBUTIONS

The table presents the calculation of the contribution rates for the Plan for this valuation and compares the total contribution rate with the prior year rate. The tables on the following pages contain more details on the calculation of the UAL amortization payments, as well as details on the calculation of the contribution rates for each group and tier. This includes the second year of phase-in of the assumption change.

Development of the	e Net Employer	Table IV-1 Contribution		30, 2016 for l	FYE 2018						
June 30, 2016 J											
	Gen	eral	Saf	ety	COMPOSITE	COMPOSITE					
	County and	Ceres and	County and	Ceres and							
	Former	Other	Former	Other							
	County	Districts	County	Districts							
1. Total Normal Cost Rate	19.23%	20.45%	31.29%	32.96%	21.82%	22.17%					
2. Member Contribution Rate	<u>8.97%</u>	<u>8.62%</u>	<u>13.29%</u>	<u>13.18%</u>	<u>9.85%</u>	<u>9.92%</u>					
3. Employer Normal Cost Rate (1-2)	10.26%	11.83%	18.00%	19.78%	11.97%	12.24%					
4. UAL Amortization	17.49%	18.87%	24.72%	24.63%	19.04%	17.66%					
5. Administrative Expense Rate	0.84%	0.93%	1.29%	1.34%	<u>0.94%</u>	<u>0.96%</u>					
6. Net Employer Contribution Rate (3+4+5)	28.59%	31.63%	44.01%	45.75%	31.95%	30.86%					
7. Phase-In of Assumption Changes	<u>-2.72%</u>	<u>-2.72%</u>	<u>-3.79%</u>	<u>-3.79%</u>	<u>-2.94%</u>	<u>-5.87%</u>					
8. Final Employer Contribution Rate (6+7)	25.87%	28.91%	40.22%	41.96%	29.01%	24.99%					



SECTION IV - CONTRIBUTIONS

Table IV-2 contains the details of the calculations of the UAL rates for the Plan.

Table IV-2 Development of UAL Amortization Rates											
		Ger	iera	ıl		Sat	fety			TOTAL	
	F	County and ormer County	Ce	eres and Other Districts		County and ormer County	Ce	res and Other Districts			
Salary Scale:											
2017+		3.25%		3.25%		3.25%		3.25%		N/A	
Amortization Factor		13.7846		13.7846		13.7846		13.7846		N/A	
Payroll	\$	200,152,777	\$	8,386,593	\$	47,670,176	\$	7,186,172	\$	263,395,718	
Unfunded Actuarial Liability (actuarial value)	\$	482,664,057	\$	21,814,152	\$	162,423,585	\$	24,400,661	\$	691,302,455	
UAL Amortization	\$	35,014,771	\$	1,582,503	\$	11,782,988	\$	1,770,141	\$	50,150,403	
UAL Amortization Rate		17.49%		18.87%		24.72%		24.63%		19.04%	



SECTION IV - CONTRIBUTIONS

Tables IV-3 and IV-4 contain the calculations of the employer contribution rates for each group and tier, and reflects the second year of the three-year phase-in of the assumption change.

Table IV-3 Development of the General Member Contribution Rate as of June 30, 2016 for FYE 2018											
Development of the General Me	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	PEPRA	TOTAL				
County and Former County											
A. Total Normal Cost Rate	21.63%	17.40%	4.32%	18.43%	20.62%	16.13%	19.23%				
B. Member Contribution Rate	<u>8.43</u> %	<u>7.98</u> %	0.00%	1.08%	<u>9.56</u> %	<u>8.06</u> %	<u>8.97%</u>				
C. Employer Normal Cost Rate (A-B)	13.20%	9.42%	4.32%	17.35%	11.06%	8.07%	10.26%				
D. UAL Amortization Rate	17.49%	17.49%	17.49%	17.49%	17.49%	17.49%	17.49%				
E. Administrative Expense Rate	<u>0.93</u> %	<u>0.81</u> %	<u>0.66</u> %	<u>1.06</u> %	<u>0.86</u> %	<u>0.77</u> %	<u>0.84%</u>				
F. Net June 30, 2016 Contribution Rate (C+D+E)	31.62%	27.72%	22.47%	35.90%	29.41%	26.33%	28.59%				
G. Impact of Phase-In of Assumption Changes	-2.72%	-2.72%	-2.72%	-2.72%	-2.72%	-2.72%	-2.72%				
H. Phase-In June 30, 2016 Contribution Rate (F+G)	28.90%	25.00%	19.75%	33.18%	26.69%	23.61%	25.87%				
Ceres and Other Districts											
A. Total Normal Cost Rate		16.25%		13.70%	21.80%	16.24%	20.45%				
B. Member Contribution Rate		<u>7.78</u> %		0.00%	<u>8.95</u> %	8.12%	<u>8.62%</u>				
C. Employer Normal Cost Rate (A-B)		8.47%		13.70%	12.85%	8.12%	11.83%				
D. UAL Amortization Rate		18.87%		18.87%	18.87%	18.87%	18.87%				
E. Administrative Expense Rate		0.83%		0.99%	0.96%	0.82%	<u>0.93%</u>				
F. Net June 30, 2016 Contribution Rate (C+D+E)		2 8.17 %		33.56%	32.68%	27.81%	31.63%				
G. Impact of Phase-In of Assumption Changes		-2.72%		-2.72%	-2.72%	-2.72%	-2.72%				
H. Phase-In June 30, 2016 Contribution Rate (F+G)		25.45%		30.84%	29.96%	25.09%	28.91%				

Administrative expenses allocated based on projected Employer Normal Cost and UAL Amortization contributions. See Table IV-5.



SECTION IV – CONTRIBUTIONS

Table IV-4										
Development of the Safety Member Contri		of June 30, 2	016 for FYE	2018						
	Tier 2	Tier 4	Tier 5	PEPRA	TOTAL					
County and Former County										
A. Total Normal Cost Rate	29.49%	0.00%	33.37%	26.16%	31.29%					
B. Member Contribution Rate	<u>12.60</u> %	<u>0.00</u> %	<u>13.44</u> %	<u>13.08</u> %	<u>13.29%</u>					
C. Employer Normal Cost Rate (A-B)	16.89%	0.00%	19.93%	13.08%	18.00%					
D. UAL Amortization Rate	24.72%	24.72%	24.72%	24.72%	24.72%					
E. Administrative Expense Rate	<u>1.26</u> %	<u>0.75</u> %	<u>1.35</u> %	<u>1.14</u> %	<u>1.29%</u>					
F. Net June 30, 2016 Contribution Rate (C+D+E)	42.87%	25.47%	46.00%	38.94%	44.01%					
G. Impact of Phase-In of Assumption Changes	-3.79%	-3.79%	-3.79%	-3.79%	-3.79%					
H. Phase-In June 30, 2016 Contribution Rate (F+G)	39.08%	21.68%	42.21%	35.15%	40.22%					
Ceres and Other Districts										
A. Total Normal Cost Rate			33.35%	29.87%	32.96%					
B. Member Contribution Rate			<u>12.96</u> %	<u>14.93</u> %	<u>13.18%</u>					
C. Employer Normal Cost Rate (A-B)			20.39%	14.94%	19.78%					
D. UAL Amortization Rate			24.63%	24.63%	24.63%					
E. Administrative Expense Rate			1.36%	1.20%	<u>1.34%</u>					
F. Net June 30, 2016 Contribution Rate (C+D+E)			46.38%	40.77%	45.75%					
G. Impact of Phase-In of Assumption Changes			-3.79%	-3.79%	-3.79%					
H. Phase-In June 30, 2016 Contribution Rate (F+G)			42.59%	36.98%	41.96%					

Administrative expenses allocated based on projected Employer Normal Cost and UAL Amortization contributions. See Table IV-6.



SECTION IV – CONTRIBUTIONS

Tables IV-5 and IV-6 show the allocation of the administrative expense for each group and tier. The administrative expense is allocated to each group and tier based on their share of the projected employer contributions prior to inclusion of the administrative expense.

Development of the	o Co	noral Mon	nho		IV-5	Pot	o ac of Juno	30	2016 for EVE	2018		
Development of the		Tier 1	IIDC	Tier 2	Tier 3	Nai	Tier 4	50,	Tier 5	PEPRA		TOTAL
County and Former County												
A. Projected Payroll	\$	43,318	\$	14,334,167	\$ 795,643	\$	2,054,851	\$	134,002,854	\$ 48,921,944	\$	200,152,777
B. Employer Normal Cost Rate		13.20%		9.42%	4.32%		17.35%		11.06%	8.06%		
C. UAL Amortization Rate		<u>17.49</u> %		<u>17.49</u> %	<u>17.49</u> %		<u>17.49</u> %		<u>17.49</u> %	<u>17.49</u> %		
D. Employer Contribution Rate												
Prior to Administrative Expense (B-C)		30.69%		26.91%	21.81%		34.84%		28.55%	25.55%		
E. Projected Employer Contribution												
Prior to Administrative Expense (A*D)	\$	13,294	\$	3,857,324	\$ 173,530	\$	715,910	\$	38,257,815	\$ 12,499,557	\$	55,517,430
F. Allocated Administrative Expense	\$	403	\$	116,811	\$ 5,255	\$	21,680	\$	1,158,556	\$ 378,522	\$	1,681,226
G. Administrative Expense Rate (F÷A)		0.93%		0.81%	0.66%		1.06%		0.86%	0.77%	•	0.84%
Ceres and Other Districts												
A. Projected Payroll			\$	217,340		\$	135,400	\$	6,351,117	\$ 1,682,736	\$	8,386,593
B. Employer Normal Cost Rate				8.47%			13.70%		12.85%	8.12%		
C. UAL Amortization Rate				<u>18.87</u> %			<u>18.87</u> %		<u>18.87</u> %	18.87%		
D. Employer Contribution Rate												
Prior to Administrative Expense (B-C)				27.34%			32.57%		31.72%	26.99%		
E. Projected Employer Contribution												
Prior to Administrative Expense (A*D)			\$	59,421		\$	44,100	\$	2,014,574	\$ 454,170	\$	2,572,265
F. Allocated Administrative Expense			\$	1,799		\$	1,335	\$	61,007	\$ 13,754	\$	77,896
G. Administrative Expense Rate (F÷A)				0.83%			0.99%		0.96%	0.82%)	0.93%



SECTION IV - CONTRIBUTIONS

Table IV-6 Development of the Safety Member Administrative Expense Rate as of June 30, 2016 for FYE 2018									
Development of the Safety Memb	Tier 2	ILIV	Tier 4	aic	Tier 5	U, 2	PEPRA	<u>.</u> 2(TOTAL
County and Former County									
A. Projected Payroll	\$ 3,472,407	\$	85,035	\$	32,259,312	\$	11,853,422	\$	47,670,176
B. Employer Normal Cost Rate	16.89%		0.00%		19.93%		13.08%		
C. UAL Amortization Rate	<u>24.72</u> %		<u>24.72</u> %		<u>24.72</u> %		<u>24.72</u> %		
D. Employer Contribution RatePrior to Administrative Expense (B-C)E. Projected Employer Contribution	41.61%		24.72%		44.65%		37.80%		
Prior to Administrative Expense (A*D)	\$ 1,444,869	\$	21,021	\$	14,403,783	\$	4,480,594	\$	20,350,266
F. Allocated Administrative Expense	\$ 43,755	\$	637	\$	436,188	\$	135,685	\$	616,264
G. Administrative Expense Rate (F÷A)	1.26%		0.75%		1.35%		1.14%		1.29%
Ceres and Other Districts									
A. Projected Payroll				\$	6,363,557	\$	822,615	\$	7,186,172
B. Employer Normal Cost Rate					20.39%		14.94%		
C. UAL Amortization Rate					24.63%		24.63%		
D. Employer Contribution Rate									
Prior to Administrative Expense (B-C)					45.02%		39.57%		
E. Projected Employer Contribution									
Prior to Administrative Expense (A*D)				\$	2,864,873	\$	325,509	\$	3,190,382
F. Allocated Administrative Expense				\$	86,757	\$	9,857	\$	96,614
G. Administrative Expense Rate (F÷A)					1.36%		1.20%		1.34%



SECTION V – REQUIRED CAFR EXHIBITS

The GASB adopted Statement Nos. 67 and 68 which replaced GASB Statement Nos. 25 and 27. GASB 67 is effective for periods beginning after June 15, 2013 (first effective June 30, 2014 for the Plan) and GASB 68 is effective for fiscal years beginning after June 15, 2014 (first effective for the fiscal year July 1, 2014 to June 30, 2015 for the Employers). The disclosures needed to satisfy the new GASB requirements can be found in the StanCERA GASB 67/68 Report as of June 30, 2016.

In accordance with Government Finance Officers Association (GFOA) and their recommended checklist for Comprehensive Annual Financial Reports (CAFRs), we continue to prepare the Solvency Test disclosure and Actuarial Gain/Loss exhibit.

Solvency Test

The solvency test shows the portion of actuarial liabilities for active member contributions, inactive members, and the employer financed portion of the active members that are covered by the Actuarial Value of Assets.

The Actuarial Accrued Liability under GASB 25 is determined assuming that the Plan is ongoing and participants continue to terminate employment, retire, etc., in accordance with the actuarial assumptions. Beginning June 30, 2015, liabilities are discounted at the assumed valuation interest rate of 7.25%.



SECTION V – REQUIRED CAFR EXHIBITS

Valuation Date June 30,	(1) Active Member Contributions	(2) Retirees And Beneficiaries	SOLVE	ole V-1 NCY TEST In thousands) Actuarial Accrued Liabilities	Valuation Assets	Liabil	n of Actua lities Covel ported Ass (2)	red
2003	\$ 176,622	\$ 455,784	\$ 325,689	\$ 958,095	\$ 928,022	100%	100%	91%
2004	166,806	518,922	349,617	1,035,345	993,180	100%	100%	88%
2005	205,556	551,810	358,994	1,116,310	1,049,691	100%	100%	81%
2006 1	219,907	619,109	355,888	1,194,904	1,154,048	100%	100%	89%
2008 ²	272,657	739,838	536,329	1,548,824	1,317,167	100%	100%	57%
2009	298,342	781,082	574,292	1,653,716	1,171,767	100%	100%	16%
2010	323,940	829,323	584,561	1,737,824	1,325,801	100%	100%	30%
2011	337,201	897,384	523,133	1,757,718	1,372,046	100%	100%	26%
2012	351,569	987,546	549,598	1,888,713	1,451,764	100%	100%	20%
2013 3	191,968	1,065,792	661,466	1,919,227	1,524,076	100%	100%	40%
2014	193,301	1,144,734	688,335	2,026,371	1,644,077	100%	100%	44%
2015	196,074	1,337,781	857,667	2,391,522	1,763,629	100%	100%	27%
2016	200,960	1,427,166	908,941	2,537,067	1,845,764	100%	100%	24%

¹ Results recalculated, reflecting Level 1 assumption changes (new retirement, termination and withdrawal decrements) & new EFI EAN methodology.

³ Reflects change to include only refundable contribution balance.



² Reflects transfer as of June 30, 2008 of \$50 million from Non-Valuation to Valuation Reserves.

SECTION V – REQUIRED CAFR EXHIBITS

Table V-2 displays the historical experience of gains and losses for the Plan. Each year there will be a gain or loss due to both assets and liabilities. In addition, there can be gains or losses due to changes in plan provisions or due to the adoption of new assumptions and methods. This year there is a large loss due to low investment returns and due to plan experience.

						Tal	ble V-2					
			Act	uarial	(Gains)/Loss	es						
	(Change in UAAL beyond expected)											
Plan Y		A	sset Sources	Liability Sources		Total		Changes in Plan		Changes in		
Endi	ing		isset Sources	Liuo	inty Boarces		1 otal		Provisions		Assumptions/Methods	
6/30	0/2004	\$	8,536,049	\$	12,492,070	\$	21,028,119	\$		0	\$ (2,088,246)	
6/30	0/2005		26,573,640		11,238,430		37,812,070			0	0	
6/30	0/2006		(27,756,878)		21,366,204		(6,390,674)			0	(14,845,293)	
6/30	0/2007 1		86,178,774		0		86,178,774			0	134,470,779	
6/30	0/2008		(50,709,169)		67,324,195		16,615,026			0	0	
6/30	0/2009		228,905,354		12,996,828		241,902,182			0	0	
6/30	0/2010		(76,507,113)		37,492,978		(39,014,135)			0	(51,743,766)	
6/30	0/2011		49,205,018		(2,387,353)		46,817,665			0	(72,085,966)	
6/30	0/2012		(5,283,786)		6,191,029		907,243			0	52,606,350	
6/30	0/2013		10,200,000		8,500,000		18,700,000			0	(63,400,000)	
6/30	0/2014		(22,600,000)		6,100,000		(16,500,000)			0	400,000	
6/30	0/2015		(20,600,000)		(5,600,000)		(26,200,000)			0	269,800,000	
6/30	0/2016 ²		16,300,000		28,900,000		45,200,000			0	0	

¹Actuarial valuation was not performed for fiscal year ending June 30, 2007.



² Changes due to Actuarial Audit included as Liability Loss of \$700,000.

APPENDIX A – MEMBERSHIP INFORMATION

The data for this valuation was provided by the StanCERA as of June 30, 2016. Cheiron did not audit any of the data. However, we performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice #23.

	General N	<u> Iembers</u>	Safety M	<u>embers</u>	Tot	tal
	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016
Active Participants						
Number	3,421	3,521	723	727	4,144	4,248
Average Age	45.45	45.15	38.08	38.11	44.17	43.94
Average Service	10.94	10.62	10.25	10.29	10.82	10.56
Average Pay (does not reflect	\$ 55,116	\$ 56,364	\$ 68,004	\$ 71,555	\$ 57,364	\$ 58,964
impact of furloughs)						
Service Retired						
Number	2,472	2,552	349	367	2,821	2,919
Average Age	69.46	69.64	64.57	64.76	68.85	69.02
Average Annual Total Benefit	\$ 28,315	\$ 29,368	\$ 51,627	\$ 53,226	\$ 31,199	\$ 32,368
Beneficiaries						
Number	323	334	87	94	410	428
Average Age	72.70	73.11	66.66	66.90	71.42	71.75
Average Annual Total Benefit	\$ 16,700	\$ 16,980	\$ 27,721	\$ 27,902	\$ 19,039	\$ 19,379
Duty Disabled						
Number	108	102	118	123	226	225
Average Age	67.01	68.02	57.88	57.58	62.24	62.31
Average Annual Total Benefit	\$ 23,941	\$ 24,834	\$ 36,607	\$ 37,475	\$ 30,554	\$ 31,744
Ordinary Disabled						
Number	75	72	7	7	82	79
Average Age	64.36	64.57	57.00	58.00	63.73	63.99
Average Annual Total Benefit	\$ 15,637	\$ 16,412	\$ 22,342	\$ 23,013	\$ 16,210	\$ 16,996
Total In Pay						
Number	2,978	3,060	561	591	3,539	3,651
Average Age	69.59	69.84	63.39	63.52	68.61	68.82
Average Annual Total Benefit	\$ 26,577	\$ 27,560	\$ 44,395	\$ 45,562	\$ 29,402	\$ 30,474
Terminated Vested						
Number	393	399	80	80	473	479
Average Age	50.07	49.88	43.33	42.48	48.93	48.64
Average Service	10.00	10.23	10.01	9.27	10.00	10.07
Transfers						
Number	367	398	139	153	506	551
Average Age	46.41	46.51	40.61	41.22	44.82	45.04
Average Service	6.30	6.80	6.81	7.32	6.44	6.95
Total Inactives						
Number	760	797	219	233	979	1,030
Average Age	48.31	48.20	41.60	41.65	46.81	46.72
Average Service	8.21	8.52	7.98	7.99	8.16	8.40



APPENDIX A – MEMBERSHIP INFORMATION

Data pertaining to active and inactive Members and their beneficiaries as of the valuation date was supplied by the Plan Administrator on electronic media. As is usual in studies of this type, Member data was neither verified nor audited. Cheiron did perform an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice #23.

Plan Year Ending	Added During Year	A	Allowance Added	Removed During Year	Allowance Removed	At End of Year	Annual Allowance	% Increase in Retiree Allowance	A	verage Annual lowance
2008	369	\$	9,084,777	(148)	\$ (1,731,738)	2,666	\$ 63,296,000	19.18%	\$	23,742
2009	156	\$	2,168,425	(71)	\$ (647,870)	2,751	\$ 66,720,003	5.41%	\$	24,253
2010	159	\$	3,349,900	(80)	\$ (751,427)	2,830	\$ 71,464,735	7.11%	\$	25,334
2011	263	\$	4,724,416	(78)	\$ (1,194,042)	3,015	\$ 74,826,404	4.70%	\$	25,732
2012	226	\$	3,565,634	(99)	\$ (978,729)	3,142	\$ 80,157,222	7.12%	\$	26,737
2013	198	\$	6,036,138	(91)	\$ (1,144,584)	3,249	\$ 89,975,736	12.25%	\$	27,694
2014	222	\$	6,703,273	(86)	\$ (1,725,066)	3,385	\$ 96,405,454	7.15%	\$	28,480
2015	237	\$	7,778,716	(83)	\$ (2,043,313)	3,539	\$ 104,052,097	7.93%	\$	29,402
2016	211	\$	7,066,750	(99)	\$ (2,160,689)	3,651	\$ 111,260,240	6.93%	\$	30,474



		Cou	inty and F	ormer Cou	nty		Ceres and Other Districts General Members Safety Members Total						Total County and Former County, Ceres and Other Districts	
	General I	Members	Safety M		To		General 1							
	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016
Active Participants														
Number	3,297	3,393	643	645	3,940	4,038	124	128	80	82	204	210	4,144	4,248
Average Age	45.43	45.13	38.09	38.09	44.24	44.01	45.96	45.55	38.03	38.27	42.85	42.70	44.17	43.94
Average Service	10.91	10.58	10.18	10.21	10.79	10.52	11.87	11.73	10.83	10.87	11.46	11.40	10.82	10.56
Average Pay ¹	\$ 54,846	\$ 56,134	\$ 66,311	\$ 70,051	\$ 56,717	\$ 58,357	\$ 62,276	\$ 62,462	\$ 81,614	\$ 83,383	\$ 69,859	\$ 70,632	\$ 57,364	\$ 58,964
Terminated Vested														
Number	380	384	68	71	448	455	13	15	12	9	25	24	473	479
Average Age	49.99	49.84	43.25	42.58	48.97	48.71	52.38	50.93	43.75	41.67	48.24	47.46	48.93	48.64
Average Service	10.00	10.22	9.96	9.28	10.00	10.07	9.98	10.59	10.28	9.17	10.12	10.06	10.00	10.07
Transfers														
Number	342	370	121	125	463	495	25	28	18	28	43	56	506	551
Average Age	46.66	46.83	40.21	40.92	44.97	45.34	43.08	42.21	43.28	42.57	43.16	42.39	44.82	45.04
Average Service	6.16	6.75	6.67	6.98	6.29	6.81	8.18	7.56	7.70	8.85	7.98	8.21	6.44	6.95
Total Inactives														
Number	722	754	189	196	911	950	38	43	30	37	68	80	979	1,030
Average Age	48.41	48.36	41.31	41.52	46.94	46.95	46.26	45.26	43.47	42.35	45.03	43.91	46.81	46.72
Average Service	8.18	8.52	7.86	7.82	8.11	8.37	8.80	8.62	8.73	8.93	8.77	8.76	8.16	8.40

¹ All payroll figures shown are annual.



APPENDIX A – MEMBERSHIP INFORMATION

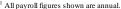
County and Former County Members

County and Former County Members																		
						General l	Members								Safety M	embers		
	Tie	r 1	Tie	r 2	Tie	r 3	Tie	r 4	Tie	r 5	PEP	RA	Tiers	1 & 4	Tiers	2 & 5	PEP	PRA
	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016
Active Participants																		
Number	1	1	247	247	17	15	36	23	2,227	2,070	769	1,037	2	1	480	446	161	198
Average Age	56.00	57.00	38.73	39.66	53.24	53.40	61.00	61.22	48.95	49.59	36.49	37.05	59.50	62.00	41.27	42.09	28.32	28.93
Average Service	16.76	17.76	4.09	5.25	17.75	18.05	34.73	35.00	14.61	15.40	1.12	1.58	26.57	21.63	13.16	13.96	1.08	1.72
Average Pay ¹	\$ 37,398	\$ 41,745	\$ 50,552	\$ 54,911	\$ 49,340	\$ 51,118	\$ 74,329	\$ 86,099	\$ 59,919	\$ 62,361	\$ 40,768	\$ 43,416	\$ 83,543	\$ 81,949	\$ 71,433	\$ 76,864	\$ 50,826	\$ 54,645
Terminated Vested																		
Number	17	11	66	58	22	21	1	1	274	293	0	0	0	0	68	70	0	1
Average Age	62.24	62.55	55.95	55.86	54.77	56.05	66.00	67.00	47.35	47.67	0.00	0.00	0.00	0.00	43.25	42.83	0.00	25.00
Average Service	10.47	10.20	8.85	8.77	12.15	12.74	5.55	5.55	10.09	10.34	0.00	0.00	0.00	0.00	9.96	9.41	0.00	0.24
Transfers																		
Number	4	5	118	119	13	13	2	2	193	207	12	24	1	1	114	115	6	9
Average Age	61.75	61.80	48.61	48.18	50.54	50.08	58.00	59.00	45.49	46.71	35.08	35.33	67.00	68.00	40.27	41.29	34.67	33.22
Average Service	10.81	11.59	2.49	2.89	15.86	14.61	14.33	14.33	7.89	8.92	1.04	1.25	6.08	6.08	6.97	7.41	1.17	1.67
Total Inactives																		
Number	21	16	184	177	35	34	3	3	467	500	12	24	1	1	182	185	6	10
Average Age	62.14	62.31	51.24	50.69	53.20	53.76	60.67	61.67	46.58	47.27	35.08	35.33	67.00	68.00	41.38	41.87	34.67	32.40
Average Service	10.53	10.63	4.77	4.81	13.53	13.46	11.41	11.41	9.18	9.75	1.04	1.25	6.08	6.08	8.09	8.16	1.17	1.52

¹ All payroll figures shown are annual.

CERES and Other District Members

			General Members											Safety Members				
	Tier	1	Tie	r 2	Tie	r3	Tie	r 4	Tie	r 5	PEP	RA	Tiers	1 & 4	Tiers	2 & 5	PEP	RA
	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016	7/1/2015	7/1/2016
Active Participants																		
Number	0	0	4	4	0	0	2	2	90	86	28	36	0	0	72	68	8	14
Average Age	0.00	0.00	44.00	45.00	0.00	0.00	61.00	62.00	48.40	48.77	37.32	37.00	0.00	0.00	38.89	39.54	30.25	32.07
Average Service	0.00	0.00	9.56	10.56	0.00	0.00	41.13	42.13	14.66	15.31	1.14	1.64	0.00	0.00	11.96	12.91	0.68	0.97
Average Pay ¹	\$ 0	\$ 0	\$ 48,436	\$ 52,363	\$ 0	\$ 0	\$ 62,454	\$ 65,243	\$ 68,978	\$ 70,998	\$ 42,695	\$ 43,040	\$ 0	\$ 0	\$ 84,047	\$ 89,555	\$ 59,711	\$ 53,405
Terminated Vested																		
Number	1	1	4	4	0	0	0	0	8	9	0	1	0	0	12	9	0	0
Average Age	61.00	62.00	55.25	56.25	0.00	0.00	0.00	0.00	49.88	48.33	0.00	42	0.00	0.00	43.75	41.67	0.00	0.00
Average Service	5.32	5.32	7.59	7.59	0.00	0.00	0.00	0.00	11.75	12.21	0.00	13	0.00	0.00	10.28	9.17	0.00	0.00
Transfers																		
Number	0	0	5	5	0	0	0	0	19	21	1	2	0	0	18	27	0	1
Average Age	0.00	0.00	50.00	51.00	0.00	0.00	0.00	0.00	41.79	41.38	33.00	29.00	0.00	0.00	43.28	43.07	0.00	29.00
Average Service	0.00	0.00	2.19	2.19	0.00	0.00	0.00	0.00	10.16	9.39	0.55	1.75	0.00	0.00	7.70	9.12	0.00	1.73
Inactives																		
Number	1	1	9	9	0	0	0	0	27	30	1	3	0	0	30	36	0	1
Average Age	61.00	62.00	52.33	53.33	0.00	0.00	0.00	0.00	44.19	43.47	33.00	33.33	0.00	0.00	43.47	42.72	0.00	29.00
Average Service	5.32	5.32	4.59	4.59	0.00	0.00	0.00	0.00	10.63	10.24	0.55	5.59	0.00	0.00	8.73	9.13	0.00	1.73





APPENDIX A – MEMBERSHIP INFORMATION

Valuation Date	Plan Type	Number	Annual Payroll	Average Annual Salary	Increase in Average Pay
June 30, 2003	General	3,626	\$163,505,000	\$45,092	6.76%
	Safety	637	\$34,159,000	\$53,625	3.98%
	Total	4,263	\$197,664,000	\$46,367	5.23%
June 30, 2004	General	3,618	\$164,462,000	\$45,457	0.81%
	Safety	630	\$35,501,000	\$56,351	5.08%
	Total	4,248	\$199,963,000	\$47,072	1.52%
June 30, 2005	General	3,651	\$173,399,000	\$47,494	4.48%
	Safety	687	\$38,282,000	\$55,723	-1.11%
	Total	4,338	\$211,681,000	\$48,797	3.66%
June 30, 2006	General	3,702	\$179,767,000	\$48,559	2.24%
	Safety	689	\$40,001,000	\$58,057	4.19%
	Total	4,391	\$219,768,000	\$50,050	2.57%
June 30, 2008	General	3,719	\$230,942,000	\$62,098	27.88%
	Safety	731	\$44,638,000	\$61,064	5.18%
	Total	4,450	\$275,580,000	\$61,928	23.73%
June 30, 2009	General	3,627	\$201,144,000	\$55,457	-10.69%
	Safety	739	\$47,172,000	\$63,832	4.53%
	Total	4,366	\$248,316,000	\$56,875	-8.16%
June 30, 2010	General	3,464	\$202,200,198	\$58,372	5.26%
	Safety	685	\$46,630,275	\$68,073	6.64%
	Total	4,149	\$248,830,473	\$59,974	5.45%
June 30, 2011	General	3,232	\$184,906,498	\$57,211	-1.99%
	Safety	637	\$41,800,298	\$65,621	-3.60%
	Total	3,869	\$226,706,796	\$58,596	-2.30%
June 30, 2012	General	3,233	\$179,260,736	\$55,447	-3.08%
	Safety	661	\$41,657,273	\$63,022	-3.96%
	Total	3,894	\$220,918,009	\$56,733	-3.18%
June 30, 2013	General	3,230	\$176,437,755	\$54,625	-1.48%
	Safety	694	\$42,590,563	\$61,370	-2.62%
	Total	3,924	\$219,028,318	\$55,818	-1.61%
June 30, 2014	General	3,303	\$179,606,090	\$54,377	-0.45%
	Safety	689	\$43,422,198	\$63,022	2.69%
	Total	3,992	\$223,028,288	\$55,869	0.09%
June 30, 2015	General	3,421	\$188,550,804	\$55,116	1.36%
	Safety	723	\$49,166,923	\$68,004	7.91%
	Total	4,144	\$237,717,727	\$57,364	2.68%
June 30, 2016	General	3,521	\$198,457,059	\$56,364	2.26%
	Safety	727	\$52,020,521	\$71,555	5.22%
	Total	4,248	\$250,477,580	\$58,964	2.79%

Actuarial valuation was not performed for fiscal year ending June 30, 2007.



StanCERA Membership – Retired Members as of June 30, 2016

	Co	unty and Fo	rmer Count	y	C	eres and Ot	her Districts		Tot	al
	General M	<u> Iembers</u>	Safety M	<u>lembers</u>	General N	<u> Iembers</u>	Safety M	<u>lembers</u>		
		Annual		Annual		Annual		Annual		Annual
		Average		Average		Average		Average		Average
Age	Number	Benefit	Number	Benefit	Number	Benefit	Number	Benefit	Number	Benefit
35-39	0	\$ 0	0	\$0	0	\$ 0	0	\$0	0	\$0
40-44	0	\$0	0	\$ 0	0	\$0	0	\$ 0	0	\$ 0
45-49	0	\$0	4	\$ 53,013	0	\$0	0	\$ 0	4	\$ 53,013
50-54	52	\$ 19,387	45	\$ 60,831	0	\$0	5	\$ 29,581	102	\$ 38,171
55-59	207	\$ 28,060	54	\$ 49,246	7	\$ 23,244	3	\$ 102,382	271	\$ 32,980
60-64	472	\$ 33,209	72	\$ 46,820	15	\$ 28,677	4	\$ 106,153	563	\$ 35,347
65-69	671	\$ 32,944	71	\$ 56,106	17	\$ 28,821	2	\$ 67,608	761	\$ 35,104
70-74	467	\$ 29,980	57	\$ 57,453	10	\$ 30,569	0	\$ 0	534	\$ 32,924
75-79	279	\$ 24,108	27	\$ 49,897	5	\$ 35,817	0	\$ 0	311	\$ 26,536
80-84	145	\$ 23,639	13	\$ 51,045	3	\$ 51,130	0	\$ 0	161	\$ 26,364
85-89	126	\$ 23,970	4	\$ 25,147	0	\$0	0	\$ 0	130	\$ 24,006
90-94	54	\$ 20,968	6	\$ 28,289	0	\$0	0	\$ 0	60	\$ 21,700
95+	22	\$ 14,661	0	\$ 0	0	\$ 0	0	\$0	22	\$ 14,661
All Ages	2,495	\$ 29,349	353	\$ 52,462	57	\$ 30,193	14	\$ 72,491	2,919	\$ 32,368



StanCERA Membership - Service-Connected Disabled Members as of June 30, 2016

	Co	unty and Fo	ormer Count	y	C	eres and Ot	her Districts		Tot	al
	General M	<u> Iembers</u>	Safety M	<u>lembers</u>	General N	<u> Iembers</u>	Safety M	embers		
		Annual		Annual		Annual		Annual		Annual
		Average		Average		Average		Average		Average
Age	Number	Benefit	Number	Benefit	Number	Benefit	Number	Benefit	Number	Benefit
25-29	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
30-34	0	\$ 0	4	\$ 25,317	0	\$ 0	0	\$ 0	4	\$ 25,317
35-39	0	\$ 0	3	\$ 34,751	0	\$ 0	1	\$ 50,244	4	\$ 38,624
40-44	1	\$ 15,007	5	\$ 33,558	0	\$ 0	0	\$ 0	6	\$ 30,466
45-49	2	\$ 22,579	17	\$ 37,770	0	\$ 0	1	\$ 29,717	20	\$ 35,848
50-54	2	\$ 27,382	14	\$ 33,604	1	\$ 29,388	0	\$ 0	17	\$ 32,624
55-59	7	\$ 22,301	20	\$ 31,443	0	\$ 0	0	\$ 0	27	\$ 29,073
60-64	24	\$ 23,716	22	\$ 42,386	1	\$ 23,022	3	\$ 39,409	50	\$ 32,859
65-69	23	\$ 27,238	15	\$ 44,566	2	\$ 24,357	0	\$ 0	40	\$ 33,592
70-74	12	\$ 21,663	12	\$ 36,388	2	\$ 21,107	1	\$ 79,574	27	\$ 30,311
75-79	14	\$ 27,598	3	\$ 35,584	0	\$ 0	0	\$ 0	17	\$ 29,007
80-84	6	\$ 22,957	2	\$ 36,255	0	\$ 0	0	\$ 0	8	\$ 26,282
85-89	5	\$ 27,789	0	\$ 0	0	\$ 0	0	\$ 0	5	\$ 27,789
90-94	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
95+	0	\$ 0	0	\$ 0	0	\$0	0	\$ 0	0	\$ 0
All Ages	96	\$ 24,893	117	\$ 37,022	6	\$ 23,889	6	\$ 46,294	225	\$ 31,744



StanCERA Membership - Nonservice-Connected Disabled Members as of June 30, 2016

	Co	ounty and Fo	rmer Count	y	C	eres and Ot	her Districts		Tot	al
	General N	<u> Members</u>	Safety M	<u>lembers</u>	General N	<u> Members</u>	Safety M	<u>embers</u>		
		Annual		Annual		Annual		Annual		Annual
		Average		Average		Average		Average		Average
Age	Number	Benefit	Number	Benefit	Number	Benefit	Number	Benefit	Number	Benefit
35-39	1	\$ 13,974	0	\$ 0	0	\$ 0	0	\$ 0	1	\$ 13,974
40-44	2	\$ 15,824	0	\$ 0	0	\$ 0	0	\$ 0	2	\$ 15,824
45-49	3	\$ 17,844	1	\$ 22,256	0	\$ 0	1	\$ 34,973	5	\$ 22,152
50-54	7	\$ 16,225	0	\$ 0	0	\$ 0	0	\$ 0	7	\$ 16,225
55-59	9	\$ 17,567	1	\$ 25,388	0	\$ 0	0	\$ 0	10	\$ 18,349
60-64	10	\$ 18,028	2	\$ 22,080	0	\$ 0	0	\$ 0	12	\$ 18,704
65-69	18	\$ 16,167	1	\$ 14,213	0	\$0	0	\$ 0	19	\$ 16,064
70-74	10	\$ 18,781	1	\$ 20,100	0	\$ 0	0	\$ 0	11	\$ 18,901
75-79	8	\$ 13,190	0	\$ 0	0	\$0	0	\$ 0	8	\$ 13,190
80-84	1	\$ 11,840	0	\$ 0	0	\$ 0	0	\$ 0	1	\$ 11,840
85-89	2	\$ 13,685	0	\$ 0	0	\$0	0	\$ 0	2	\$ 13,685
90-94	1	\$ 6,978	0	\$ 0	0	\$0	0	\$ 0	1	\$ 6,978
95+	0	\$0	0	\$ 0	0	\$0	0	\$0	0	\$ 0
All Ages	72	\$ 16,412	6	\$ 21,019	0	\$ 0	1	\$ 34,973	79	\$ 16,996



APPENDIX A – MEMBERSHIP INFORMATION

StanCERA Membership – Beneficiaries as of June 30, 2016

	Co	unty and Fo	ormer Count	y	C	eres and Ot	her Districts	:	Tot	al
	General N	<u> Iembers</u>	Safety M	<u>lembers</u>	General N	<u> Members</u>	Safety M	<u>lembers</u>		
		Annual		Annual		Annual		Annual		Annual
		Average		Average		Average		Average		Average
Age	Number	Benefit	Number	Benefit	Number	Benefit	Number	Benefit	Number	Benefit
0-24	1	\$ 30,243	2	\$ 17,784	0	\$ 0	0	\$ 0	3	\$ 21,937
25-29	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0	0	\$ 0
30-34	1	\$ 36,559	0	\$ 0	0	\$ 0	0	\$ 0	1	\$ 36,559
35-39	3	\$ 9,148	0	\$ 0	0	\$ 0	0	\$ 0	3	\$ 9,148
40-44	1	\$ 5,846	2	\$ 24,632	0	\$ 0	0	\$ 0	3	\$ 18,370
45-49	15	\$ 12,061	3	\$ 22,409	0	\$ 0	0	\$ 0	18	\$ 13,786
50-54	12	\$ 11,881	5	\$ 34,295	0	\$ 0	0	\$ 0	17	\$ 18,474
55-59	12	\$ 14,320	11	\$ 16,959	0	\$ 0	2	\$ 30,832	25	\$ 16,802
60-64	35	\$ 15,023	13	\$ 22,498	0	\$ 0	0	\$ 0	48	\$ 17,047
65-69	49	\$ 19,727	13	\$ 33,379	1	\$ 11,180	0	\$ 0	63	\$ 22,409
70-74	50	\$ 17,915	9	\$ 34,163	0	\$ 0	0	\$ 0	59	\$ 20,394
75-79	38	\$ 20,916	19	\$ 32,820	1	\$ 17,401	0	\$ 0	58	\$ 24,755
80-84	40	\$ 16,782	8	\$ 33,357	0	\$ 0	0	\$ 0	48	\$ 19,545
85-89	37	\$ 17,664	6	\$ 20,959	0	\$ 0	0	\$ 0	43	\$ 18,124
90-94	24	\$ 16,040	1	\$ 964	0	\$ 0	0	\$ 0	25	\$ 15,437
95+	14	\$ 11,036	0	\$ 0	0	\$ 0	0	\$ 0	14	\$ 11,036
All Ages	332	\$ 16,996	92	\$ 27,838	2	\$ 14,291	2	\$ 30,832	428	\$ 19,379



APPENDIX A – MEMBERSHIP INFORMATION

StanCERA Membership - Benefit Form Elections as of June 30, 2016

bundeligh benefit form Ex	County and Fo	,	Ceres and Ot	her Districts	
	General	Safety	General	Safety	Total
Service Retired					
Option #0 (Unmodified 60% to Spouse)	2,054	313	43	11	2,421
Option #1 (Cash Refund)	208	9	6	0	223
Option #2 (100% Continuance)	201	29	8	2	240
Option #3 (50% Continuance)	30	1	0	1	32
Option #4 (Other)	2	1	0	0	3
Total Service Retired	2,495	353	57	14	2,919
Ordinary Disability					
Option #0 (Unmodified 60% to Spouse)	62	4	0	1	67
Option #1 (Cash Refund)	5	2	0	0	7
Option #2 (100% Continuance)	5	0	0	0	5
Option #3 (50% Continuance)	0	0	0	0	0
Total Ordinary Disability	72	6	0	1	79
Duty Disability					
Option #0 (Unmodified 60% to Spouse)	86	105	5	5	201
Option #1 (Cash Refund)	1	1	1	0	3
Option #2 (100% Continuance)	6	10	0	1	17
Option #3 (50% Continuance)	3	1	0	0	4
Total Duty Disability	96	117	6	6	225
Total	2,663	476	63	21	3,223



APPENDIX A – MEMBERSHIP INFORMATION

Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2016 General Members (County and Former County)

Count

						Years o	f Service						
Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Total Count
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	17	11	2	0	0	0	0	0	0	0	0	0	30
25-29	108	88	47	11	14	8	0	0	0	0	0	0	276
30-34	89	72	69	49	37	65	22	0	0	0	0	0	403
35-39	57	67	47	30	28	108	102	27	1	0	0	0	467
40-44	30	37	29	19	20	88	116	98	9	0	0	0	446
45-49	31	26	25	9	17	86	91	118	50	11	0	0	464
50-54	27	27	20	13	5	57	94	129	72	46	8	0	498
55-59	18	16	10	8	11	57	83	111	47	60	20	7	448
60-64	9	2	6	3	7	39	58	62	36	30	6	10	268
65-69	2	1	2	1	1	15	16	17	13	7	1	1	77
70 & Over	1	0	0	0	0	1	6	7	0	0	0	1	16
Total Count	389	347	257	143	140	524	588	569	228	154	35	19	3,393

	Years of Service													
Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Avg. Comp.	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0	
20-24	34,927	33,242	33,606	0	0	0	0	0	0	0	0	0	34,221	
25-29	40,653	38,393	41,490	47,536	46,234	46,908	0	0	0	0	0	0	40,814	
30-34	42,337	45,531	45,928	53,697	49,943	54,876	50,362	0	0	0	0	0	48,063	
35-39	45,121	42,374	46,101	48,077	51,510	55,274	59,057	58,120	39,115	0	0	0	51,529	
40-44	43,099	41,921	45,317	49,107	58,781	58,426	54,736	65,453	76,556	0	0	0	55,742	
45-49	43,533	43,500	45,190	53,011	52,812	59,959	57,509	68,539	68,144	68,933	0	0	59,543	
50-54	42,705	48,828	51,065	55,118	44,953	58,378	65,119	63,274	64,767	71,526	71,349	0	61,384	
55-59	46,961	45,518	52,599	46,527	63,240	59,877	62,729	60,504	72,233	70,252	78,575	62,530	62,773	
60-64	49,224	36,418	74,121	52,496	62,175	48,869	62,533	63,264	70,935	77,462	50,372	80,804	63,419	
65-69	93,127	34,867	82,858	40,352	35,661	71,283	64,412	58,606	75,065	64,217	42,199	47,357	65,895	
70 & Over	219,835	0	0	0	0	265,000	99,845	51,163	0	0	0	44,565	92,913	
Average	43,224	42,357	46,517	51,000	52,873	57,615	60,032	63,667	68,961	71,668	71,049	70,404	56,134	



APPENDIX A – MEMBERSHIP INFORMATION

Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2016 General Members (Ceres and Other Districts)

Count

						Years o	f Service						
Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Total Count
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	2	2	0	0	0	0	0	0	0	0	0	0	4
25-29	1	3	3	1	0	0	0	0	0	0	0	0	8
30-34	3	1	2	2	3	0	1	0	0	0	0	0	12
35-39	3	3	0	1	0	3	8	2	0	0	0	0	20
40-44	2	1	1	0	1	3	4	3	1	0	0	0	16
45-49	2	1	0	0	1	4	4	1	1	1	1	0	16
50-54	0	2	0	1	0	4	4	4	1	3	0	0	19
55-59	0	1	1	0	0	3	2	6	3	3	0	1	20
60-64	0	0	1	1	0	0	2	0	2	0	1	0	7
65-69	0	0	0	0	0	3	0	1	0	0	0	1	5
70 & Over	0	0	0	0	0	1	0	0	0	0	0	0	1
Total Count	13	14	8	6	5	21	25	17	8	7	2	2	128

						Years of	Service						
Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Avg. Comp.
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	35,688	37,752	0	0	0	0	0	0	0	0	0	0	36,720
25-29	31,217	36,374	39,943	53,508	0	0	0	0	0	0	0	0	39,210
30-34	36,563	64,273	52,558	40,086	66,813	0	47,523	0	0	0	0	0	50,601
35-39	47,964	40,784	0	40,929	0	69,055	64,164	66,583	0	0	0	0	58,041
40-44	53,038	31,907	39,321	0	55,384	56,588	66,086	78,178	68,565	0	0	0	60,618
45-49	54,847	55,718	0	0	171,672	74,645	74,367	88,104	82,549	68,144	84,914	0	78,553
50-54	0	86,178	0	39,064	0	80,764	58,752	62,891	57,480	63,835	0	0	66,844
55-59	0	47,288	36,663	0	0	53,270	73,652	61,835	85,544	66,192	0	74,632	64,596
60-64	0	0	35,856	38,106	0	0	54,673	0	80,523	0	52,527	0	56,697
65-69	0	0	0	0	0	102,601	0	92,112	0	0	0	55,853	91,153
70 & Over	0	0	0	0	0	125,258	0	0	0	0	0	0	125,258
Average	43,996	48,466	42,098	41,963	85,499	75,783	64,572	68,852	78,284	65,461	68,720	65,243	62,462



APPENDIX A – MEMBERSHIP INFORMATION

Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2016 Safety Members (County and Former County)

Count

	Years of Service													
Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Total Count	
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0	
20-24	12	11	3	0	0	0	0	0	0	0	0	0	26	
25-29	29	36	29	22	4	1	0	0	0	0	0	0	121	
30-34	8	17	7	9	15	43	14	0	0	0	0	0	113	
35-39	4	8	6	8	3	20	56	11	0	0	0	0	116	
40-44	0	1	1	0	1	12	33	46	6	0	0	0	100	
45-49	0	2	0	1	0	6	12	30	27	6	0	0	84	
50-54	1	1	1	1	0	6	11	10	13	10	1	0	55	
55-59	0	1	0	3	0	3	1	5	3	0	0	0	16	
60-64	0	0	0	0	0	0	3	3	1	2	0	0	9	
65-69	0	0	0	1	0	3	0	0	1	0	0	0	5	
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Count	54	77	47	45	23	94	130	105	51	18	1	0	645	

						Years of	f Service						
Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Avg. Comp.
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	48,682	51,632	52,091	0	0	0	0	0	0	0	0	0	50,323
25-29	50,135	52,159	56,984	61,112	65,614	73,164	0	0	0	0	0	0	55,077
30-34	54,787	55,451	53,903	59,598	63,313	70,572	70,750	0	0	0	0	0	64,332
35-39	54,022	60,129	60,403	63,154	66,819	72,882	75,664	81,172	0	0	0	0	72,008
40-44	0	60,088	70,587	0	71,920	74,064	72,554	82,215	76,727	0	0	0	77,279
45-49	0	75,154	0	45,451	0	71,521	75,416	82,659	85,365	80,747	0	0	80,940
50-54	79,150	76,144	154,710	84,761	0	67,625	76,101	93,439	82,643	90,213	118,670	0	84,858
55-59	0	57,685	0	74,194	0	76,940	72,671	90,549	73,563	0	0	0	78,575
60-64	0	0	0	0	0	0	64,408	82,334	81,949	75,969	0	0	74,901
65-69	0	0	0	85,117	0	95,125	0	0	92,143	0	0	0	92,527
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0
Average	51,326	54,722	59,018	62,755	64,545	72,396	74,077	83,702	83,027	85,475	118,670	0	70,051



APPENDIX A – MEMBERSHIP INFORMATION

Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2016 General Members (Ceres and Other Districts)

Count

						Years o	f Service						
Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Total Count
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	0	1	0	0	0	0	0	0	0	0	0	0	1
25-29	5	2	1	3	1	1	0	0	0	0	0	0	13
30-34	4	1	0	2	2	9	2	0	0	0	0	0	20
35-39	0	0	1	0	0	3	5	2	0	0	0	0	11
40-44	0	1	0	0	1	1	7	7	1	0	0	0	18
45-49	1	1	0	0	0	1	1	4	2	2	0	0	12
50-54	0	1	0	0	0	0	0	0	2	0	0	0	3
55-59	0	0	0	0	0	0	0	0	1	0	1	0	2
60-64	0	0	0	0	0	1	0	0	0	0	1	0	2
65-69	0	0	0	0	0	0	0	0	0	0	0	0	0
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Count	10	7	2	5	4	16	15	13	6	2	2	0	82

						Years of	Service						
Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35 & Over	Avg. Comp.
Under 20	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	0	56,363	0	0	0	0	0	0	0	0	0	0	56,363
25-29	44,519	57,076	62,639	74,253	81,550	72,445	0	0	0	0	0	0	59,703
30-34	49,019	84,469	0	80,274	64,799	82,945	86,064	0	0	0	0	0	74,466
35-39	0	0	87,652	0	0	80,704	88,248	89,794	0	0	0	0	86,418
40-44	0	89,634	0	0	73,997	102,637	90,408	101,336	108,983	0	0	0	95,415
45-49	74,885	83,650	0	0	0	67,506	92,861	97,876	116,729	97,612	0	0	94,924
50-54	0	60,463	0	0	0	0	0	0	112,763	0	0	0	95,330
55-59	0	0	0	0	0	0	0	0	90,044	0	101,182	0	95,613
60-64	0	0	0	0	0	99,990	0	0	0	0	131,265	0	115,628
65-69	0	0	0	0	0	0	0	0	0	0	0	0	0
70 & Over	0	0	0	0	0	0	0	0	0	0	0	0	0
Average	49,356	69,819	75,146	76,661	71,287	83,199	89,273	98,496	109,668	97,612	116,224	0	83,383



APPENDIX A – MEMBERSHIP INFORMATION

Reconciliation of Plan Membership Since Prior Valuation All Members

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
July 1, 2015	4,144	506	283	473	82	226	2,821	410	8,945
New Entrants	506	0	0	0	0	0	0	0	506
Rehires	13	(1)	(7)	(3)	0	0	0	0	2
Duty Disabilities	(5)	(1)	0	0	0	6	0	0	0
Ordinary Disabilities	(1)	0	0	0	1	0	0	0	0
Retirements	(126)	(13)	(1)	(29)	0	0	169	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(56)	(7)	0	63	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	(1)	0	0	0	(5)	(3)	(21)	30	0
Died, Without Beneficiary, and Other Terminations	(102)	(2)	102	(1)	0	(3)	(50)	0	(56)
Transfers	(36)	75	(14)	(22)	0	0	0	0	3
Beneficiary Deaths	0	0	0	0	0	0	0	(17)	(17)
Domestic Relations Orders	0	0	0	0	0	0	0	4	4
Withdrawals Paid	(88)	(5)	(36)	(2)	0	0	0	0	(131)
Member Reclassifications	0	(1)	0	0	1	(1)	0	1	0
July 1, 2016	4,248	551	327	479	79	225	2,919	428	9,256



APPENDIX A – MEMBERSHIP INFORMATION

Reconciliation of Plan Membership Since Prior Valuation General Members (County and Former County)

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
July 1, 2015	3,297	342	234	380	75	102	2,420	322	7,172
New Entrants	424	0	0	0	0	0	0	0	424
Rehires	11	(1)	(6)	(3)	0	0	0	0	1
Duty Disabilities	0	0	0	0	0	0	0	0	0
Ordinary Disabilities	(1)	0	0	0	1	0	0	0	0
Retirements	(107)	(10)	(1)	(22)	0	0	140	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(41)	(4)	0	45	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	0	0	0	0	(5)	(2)	(18)	25	0
Died, Without Beneficiary, and Other Terminations	(87)	(2)	87	(1)	0	(3)	(47)	0	(53)
Transfers	(31)	50	(6)	(11)	0	0	0	0	2
Beneficiary Deaths	0	0	0	0	0	0	0	(17)	(17)
Domestic Relations Orders	0	0	0	0	0	0	0	1	1
Withdrawals Paid	(72)	(4)	(32)	(2)	0	0	0	0	(110)
Member Reclassifications	0	(1)	1	(2)	1	(1)	0	1	(1)
July 1, 2016	3,393	370	277	384	72	96	2,495	332	7,419



APPENDIX A – MEMBERSHIP INFORMATION

Reconciliation of Plan Membership Since Prior Valuation Safety Members (County and Former County)

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
July 1, 2015	643	121	33	68	6	113	337	86	1,407
New Entrants	56	0	0	0	0	0	0	0	56
Rehires	2	0	(1)	0	0	0	0	0	1
Duty Disabilities	(4)	(1)	0	0	0	5	0	0	0
Ordinary Disabilities	0	0	0	0	0	0	0	0	0
Retirements	(15)	(2)	0	(4)	0	0	21	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(11)	(2)	0	13	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	(1)	0	0	0	0	(1)	(2)	4	0
Died, Without Beneficiary, and Other Terminations	(10)	0	10	0	0	0	(3)	0	(3)
Transfers	(2)	11	(2)	(6)	0	0	0	0	1
Beneficiary Deaths	0	0	0	0	0	0	0	0	0
Domestic Relations Orders	0	0	0	0	0	0	0	2	2
Withdrawals Paid	(13)	(1)	(3)	0	0	0	0	0	(17)
Member Reclassifications	0	(1)	0	0	0	0	0	0	(1)
July 1, 2016	645	125	37	71	6	117	353	92	1,446



APPENDIX A – MEMBERSHIP INFORMATION

Reconciliation of Plan Membership Since Prior Valuation General Members (Ceres and Other Districts)

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
July 1, 2015	124	25	9	13	0	6	52	1	230
New Entrants	14	0	0	0	0	0	0	0	14
Rehires	0	0	0	0	0	0	0	0	0
Duty Disabilities	0	0	0	0	0	0	0	0	0
Ordinary Disabilities	0	0	0	0	0	0	0	0	0
Retirements	(4)	0	0	(2)	0	0	6	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(1)	(1)	0	2	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	0	0	0	0	0	0	(1)	1	0
Died, Without Beneficiary, and Other Terminations	(3)	0	3	0	0	0	0	0	0
Transfers	(1)	4	(3)	0	0	0	0	0	0
Beneficiary Deaths	0	0	0	0	0	0	0	0	0
Domestic Relations Orders	0	0	0	0	0	0	0	0	0
Withdrawals Paid	(1)	0	(1)	0	0	0	0	0	(2)
Member Reclassifications	0	0	(1)	2	0	0	0	0	1
July 1, 2016	128	28	7	15	0	6	57	2	243



APPENDIX A – MEMBERSHIP INFORMATION

Reconciliation of Plan Membership Since Prior Valuation Safety Members (Ceres and Other Districts)

	Actives	Transfers	Non Vested Terminations due Refunds	Vested Terminations	Ordinary Disabled	Duty Disabled	Retired	Beneficiaries	Total
July 1, 2015	80	18	7	12	1	5	12	1	136
New Entrants	12	0	0	0	0	0	0	0	12
Rehires	0	0	0	0	0	0	0	0	0
Duty Disabilities	(1)	0	0	0	0	1	0	0	0
Ordinary Disabilities	0	0	0	0	0	0	0	0	0
Retirements	0	(1)	0	(1)	0	0	2	0	0
Retirements from General with Safety Service	0	0	0	0	0	0	0	0	0
Vested Terminations	(3)	0	0	3	0	0	0	0	0
Died, With Beneficiaries' Benefit Payable	0	0	0	0	0	0	0	0	0
Died, Without Beneficiary, and Other Terminations	(2)	0	2	0	0	0	0	0	0
Transfers	(2)	10	(3)	(5)	0	0	0	0	0
Beneficiary Deaths	0	0	0	0	0	0	0	0	0
Domestic Relations Orders	0	0	0	0	0	0	0	1	1
Withdrawals Paid	(2)	0	0	0	0	0	0	0	(2)
Member Reclassifications	0	1	0	0	0	0	0	0	1
July 1, 2016	82	28	6	9	1	6	14	2	148



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods used in the actuarial valuation as of July 1, 2016 are:

Actuarial Methods

1. Actuarial Cost Method

Annual contributions to the Stanislaus County Employees' Retirement Association (the Plan) are computed under the Entry Age Normal Actuarial Cost Method, computed to the final decrement.

Under this Cost Method, the Normal Cost is calculated as the amount necessary to fund Members' benefits as a level percentage of total payroll over their projected working lives. At each valuation date, the Actuarial Liability is equal to the difference between the liability for the Members' total projected benefit and the present value of future Normal Cost contributions.

The excess of the Actuarial Liability over Plan assets is the Unfunded Actuarial Liability, and the liability for each valuation group is amortized as a level percentage of payroll over a closed period (20 years as of the current valuation).

Amounts may be added to or subtracted from the Unfunded Actuarial Liability due to Plan amendments or changes in actuarial assumptions.

The total Plan cost is the sum of the Normal Cost (computed on an Individual basis), the amortization of the Unfunded Actuarial Liability, and the expected Administrative Expenses.

The increase in Plan cost due to the change in assumptions as a result of the Actuarial Experience Study Report for the period covering July 1, 2012 through June 30, 2015 is phased-in over three years, beginning with the cost calculated in the June 30, 2015 actuarial valuation. For this valuation, the phase-in is in its second year.

2. Actuarial Value of Plan Assets

The Actuarial Value of Plan assets is a modified market-related value. The Market Value of Assets is adjusted to recognize, over a five-year period, differences between actual investment earnings and the assumed investment return. The Actuarial Value of Assets is limited to no less than 80% and no more than 120% of the market value.

The detailed calculations of the Actuarial Value of Plan assets are shown in Section II.

3. Changes in Actuarial Methods

None



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

Actuarial Assumptions

All actuarial assumptions are based on the Actuarial Experience Study Report for the period covering July 1, 2012 through June 30, 2015 report. The assumptions were adopted at the March 16, 2016 Board meeting.

4. Rate of Return

The annual rate of return on all Plan assets is assumed to be 7.25%, net of investment expenses.

5. Cost of Living

The cost of living as measured by the Consumer Price Index (CPI) will increase at the rate of 3.00% per year.

6. Administrative Expenses

An allowance of \$2,472,000 for Plan administrative expenses has been included in the annual cost calculated.

7. Interest Credited to Employee Accounts

The employee accounts are credited with 0.25% interest annually.

8. Increases in Pay

Base salary increase: 3.25%

Assumed pay increases for active Members consist of increases due to base salary adjustments (as noted above), plus service-based increases due to longevity and promotion, as shown below.



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

Longevity & Promotion Increases							
Service	General	Safety					
0	6.00%	7.00%					
1	5.00%	6.00%					
2	4.00%	5.00%					
3	3.00%	4.00%					
4	2.00%	3.00%					
5	1.50%	2.00%					
6	1.00%	1.75%					
7	0.75%	1.50%					
8	0.50%	1.25%					
9	0.50%	1.00%					
10	0.50%	0.75%					
11+	0.50%	0.50%					

9. PEPRA Compensation Limit

The assumption used for increasing the compensation limit that applies to PEPRA members is 3.0%

10. Post Retirement COLA

100% of CPI up to 3% annually with banking, 2.7% annual increases assumed. Increases are assumed to occur on April 1.

11. Social Security Wage Base

General Plan 3 members have their benefits offset by an assumed Social Security Benefit. For projecting the Social Security Benefit, the annual Social Security Wage Base increase is assumed to be 3.25% per year.

12. Internal Revenue Code Section 415 Limit

The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

13. 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.



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

14. Family Composition

Percentage married for all active members who retire, become disabled, or die during active service is shown in the following table.

Percentage Married						
Gender	Gender Percentage					
Males	80%					
Females	50%					

Spouses of male members are assumed to be three years younger than the member and spouses of female members are assumed to be two years older than the member.

15. Accumulated Vacation Time Load

Active members' service retirement and related benefits are loaded by 3.0% for Safety Members and 3.5% for General Members for conversion of vacation time. No other adjustment is made to the liabilities for anticipated future service purchases.

16. Rates of Separation

Rates of termination apply to all active Members who terminate their employment.

Separate rates of termination are assumed among Safety and General Members.

Te	ermination Rat	tes
Years of	General	Safety
Service	All	All
0	18.0%	18.0%
1	14.0%	12.0%
2	11.7%	9.0%
3	9.4%	7.0%
4	7.1%	6.0%
5	5.0%	5.0%
10	3.5%	5.0%
15	2.9%	3.4%
20	1.5%	0.0%
25	1.3%	0.0%
30+	0.0%	0.0%

Termination rates do not apply once a member is eligible for retirement.



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

17. Withdrawal

Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits. Separate rates of withdrawal are assumed among Safety and General Members, and are based on service. The rates do not overlap with the service retirement rates.

50% of all General Member terminations with less than 10 years of service are assumed to take a refund of contributions, as well as 20% of those with 10 or more years of service.

35% of all Safety Member terminations with less than 10 years of service are assumed to take a refund of contributions, and 10% of those with 10 or more years are assumed to take a refund.

18. Vested Termination and Reciprocal Transfers

Rates of vested termination apply to active Members who terminate their employment after five years of service and leave their member contributions on deposit with the Plan. Alternatively, those who terminate their employment with less than five years of service can leave their member contributions with the Plan and transfer to a reciprocal employer, therefore retaining entitlement to future Plan benefits.

Vested terminated Tier 3 General Members are assumed to begin receiving benefits at age 65 while all other General Members are assumed to begin at age 58; terminated Safety Members are assumed to begin receiving benefits at age 53. 25% of vested terminated General Members are assumed to be reciprocal; 50% of vested terminated Safety Members are assumed to be reciprocal.

Reciprocal members are assumed to receive 4% annual pay increases from the date of transfer to the assumed retirement date.

19. Form of Benefit

Upon retirement, all married members are assumed to elect the normal payment form (joint & 50% survivor annuity for Tier 3 and joint & 60% survivor annuity for all other tiers). Non-married members are assumed to elect a single life annuity. Actual form elections are not anticipated to materially affect results due to the actuarially equivalent optional form factors.



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

20. Rates of Service-Connected Disability

Separate rates of duty disability are assumed among Safety and General Members; rates for both sexes for Safety Members are combined. On the next page are sample rates:

Rates of Service-Connected Disability							
	Gen	eral	Safety				
Age	Male	Female	All				
20	0.0043%	0.0002%	0.0759%				
25	0.0102%	0.0004%	0.1932%				
30	0.0211%	0.0008%	0.3457%				
35	0.0284%	0.0024%	0.5309%				
40	0.0401%	0.0056%	0.7426%				
45	0.0613%	0.0101%	1.1297%				
50	0.0897%	0.0162%	1.5092%				
55	0.1227%	0.0249%	1.7230%				
60	0.1637%	0.0349%	0.0000%				
65	0.0000%	0.0000%	0.0000%				

21. Rates of Nonservice-Connected Disability

Separate rates of ordinary disability are assumed among Safety and General Members. Rates of ordinary disability for Safety Members are assumed to follow the CalPERS Public Agency Police Non-Industrial Disability table; rates of ordinary disability for General Members are assumed to follow the CalPERS Public Agency Miscellaneous Non-Industrial Disability table. The rates shown are applied after five Years of Service. On the next page are sample rates:



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

Rates of Non Service-Connected Disability							
	Gen	eral	Safety				
Age	Male	Female	All				
20	0.0170%	0.0100%	0.0100%				
25	0.0170%	0.0100%	0.0100%				
30	0.0190%	0.0240%	0.0200%				
35	0.0490%	0.0810%	0.0300%				
40	0.1220%	0.1550%	0.0400%				
45	0.1910%	0.2180%	0.0500%				
50	0.2130%	0.2290%	0.0800%				
55	0.2210%	0.1790%	0.1300%				
60	0.2220%	0.1350%	0.2000%				
65	0.2100%	0.1180%	0.2000%				
70	0.1800%	0.1140%	0.2000%				
75	0.1420%	0.1180%	0.2000%				
80	0.1420%	0.1180%	0.2000%				
81+	0.0000%	0.0000%	0.0000%				

22. Rates of Mortality for Non-Annuitants

Rates of ordinary death for active Members are specified by the CalPERS Pre-Retirement Non-Industrial Mortality table, adjusted by 100.3% for males and 98.8% for females, with generational mortality improvements projected from 2009 using Scale MP-2015. Duty related mortality rates are only applicable for Safety Active Members, and are based on the CalPERS Pre-Retirement Individual Death table without adjustment or projection.

The table on the following page provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

	Non-Annuitant Mortality Rates									
	Ordinary Death - General and Safety Duty Death									
Age	Male	Female	Safety All							
20	0.0330%	0.0209%	0.0030%							
25	0.0426%	0.0241%	0.0070%							
30	0.0522%	0.0262%	0.0100%							
35	0.0607%	0.0368%	0.0120%							
40	0.0798%	0.0525%	0.0130%							
45	0.1129%	0.0745%	0.0140%							
50	0.1651%	0.1049%	0.0150%							
55	0.2428%	0.1508%	0.0160%							
60	0.3556%	0.2198%	0.0170%							
65	0.5107%	0.3233%	0.0180%							
70	0.7110%	0.4616%	0.0190%							

23. Rates of Mortality for Nonservice-Connected Disabled Retirees

Rates of mortality for current nonservice-connected disabled Members are specified by the CalPERS Non-Industrially Disabled Annuitant Mortality table, adjusted by 96.4% for males and 110.4% for females, with generational mortality improvements projected from 2009 using Scale MP-2015.

The table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Nonservice-Connected Disabled Mortality Rates							
Age	Male	Female					
45	1.250%	0.943%					
50	1.720%	1.358%					
55	2.020%	1.402%					
60	2.539%	1.667%					
65	3.008%	2.259%					
70	3.750%	3.107%					
75	5.204%	4.269%					
80	7.934%	6.642%					
85	12.692%	10.910%					
90	17.804%	17.755%					



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

24. Rates of Mortality for Service-Connected Disabled Retirees

Rates of mortality for current service-connected disabled Members are specified by the CalPERS Industrially Disabled Annuitant Mortality table, adjusted by 100.2% for males and 100.1% for females, with generational mortality improvements projected from 2009 using Scale MP-2015.

The table provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.

Service-Connected								
Disal	Disabled Mortality Rates							
Age	Male	Female						
45	0.339%	0.298%						
50	0.533%	0.496%						
55	0.637%	0.460%						
60	0.869%	0.634%						
65	1.431%	1.068%						
70	2.216%	1.777%						
75	3.842%	2.955%						
80	6.642%	4.983%						
85	10.410%	7.967%						
90	16.218%	12.347%						

25. Rates of Mortality for Emerging Disabled Retirees

Rates of mortality for future disabled retirees, both nonservice- and service-connected, are specified by mortality tables consisting of blends of the mortality assumptions for current nonservice- and service-connected disabled retirees. The blend for future disabled Safety retirees is 5% and 95%, respectively. The blend for future disabled General retirees is 75% and 25%, respectively. The proportions reflect the expected splits in future disabled retirees between nonservice- and service-connected disablement.

26. Rates of Mortality for Healthy Annuitants

Rates of mortality for retired Members and their beneficiaries are specified by the CalPERS Healthy Annuitant table, adjusted by 93.4% for males and 107.9% for females, with generational mortality improvements projected from 2009 using Scale MP-2015.

The table on the following page provides a sample of the base mortality rates including adjustments but prior to any projections for mortality improvements.



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

Healthy A	Healthy Annuitant Mortality Rates							
Age	Male	Female						
45	0.225%	0.229%						
50	0.497%	0.534%						
55	0.594%	0.496%						
60	0.763%	0.576%						
65	0.986%	0.807%						
70	1.649%	1.365%						
75	2.786%	2.366%						
80	4.928%	3.987%						
85	8.807%	7.202%						
90	15.118%	13.310%						

27. Mortality Improvement

As mentioned above, the mortality assumptions employ a fully generational mortality improvement projection from base year 2009 using Scale MP-2015.



APPENDIX B – STATEMENT OF CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

28. Rates of Retirement

Retirement is assumed to occur among eligible members in accordance with the table below:

	Gen	Retirement eral f Service					
Age	0-9	10-29			0-9	f Service 10-19	20+
40-44	0.00%	0.00%	0.00%	Age 40-48	0.00%	0.00%	5.00%
45-49	0.00%	0.00%	10.00%	49	0.00%	0.00%	20.00%
50-54	0.00%	5.00%	10.00%	50	0.00%	10.00%	30.00%
55	0.00%	10.00%	25.00%	51	0.00%	10.00%	20.00%
56	0.00%	10.00%	25.00%	52	0.00%	10.00%	20.00%
57	0.00%	10.00%	25.00%	53	0.00%	10.00%	20.00%
58	0.00%	15.00%	25.00%	54	0.00%	10.00%	20.00%
59	0.00%	15.00%	25.00%	55	0.00%	10.00%	30.00%
60	0.00%	15.00%	25.00%	56	0.00%	10.00%	30.00%
61	0.00%	20.00%	25.00%	57	0.00%	10.00%	30.00%
62	0.00%	25.00%	40.00%	58	0.00%	10.00%	30.00%
63	0.00%	20.00%	25.00%	59	0.00%	10.00%	30.00%
64	0.00%	25.00%	25.00%	60	0.00%	25.00%	100.00%
65	0.00%	35.00%	35.00%	61	0.00%	25.00%	100.00%
66	0.00%	45.00%	45.00%	62	0.00%	25.00%	100.00%
67	0.00%	20.00%	25.00%	63	0.00%	25.00%	100.00%
68	0.00%	20.00%	25.00%	64	0.00%	25.00%	100.00%
69	0.00%	20.00%	25.00%	65	0.00%	100.00%	100.00%
70	50.00%	50.00%	100.00%	66	0.00%	100.00%	100.00%
71	50.00%	50.00%	100.00%	67	0.00%	100.00%	100.00%
72	50.00%	50.00%	100.00%	68	0.00%	100.00%	100.00%
73	50.00%	50.00%	100.00%	69	0.00%	100.00%	100.00%
74	50.00%	50.00%	100.00%	70+	100.00%	100.00%	100.00%
75+	100.00%	100.00%	100.00%				

29. Changes in Actuarial Assumptions

The administrative expenses assumption increased by 3.00% from \$2,400,000 to \$2,472,000, per the procedure established in the Actuarial Experience Study Report for the period covering July 1, 2012 through June 30, 2015.



APPENDIX C – SUMMARY OF PLAN PROVISIONS

All actuarial calculations are based on our understanding of the statutes governing the StanCERA as contained in the County Employees Retirement Law (CERL) of 1937, with provisions adopted by the County Board of Supervisors, a district Board of Directors, or the StanCERA Board, effective through June 30, 2016. The benefit and contribution provisions of this law are summarized briefly below, along with corresponding references to the State Code. This summary does not attempt to cover all the detailed provisions of the law.

A. Definitions

Compensation:

Compensation means the cash remuneration for services paid by the employer. It includes base pay and certain differential, incentive, and special pay allowances defined by the Board of Retirement. Overtime is excluded, with the exception of overtime paid under the Fair Labor Standards Act that is regular and recurring.

For Tier 6 (PEPRA) members, only pensionable compensation up to the PEPRA Compensation Limit will count for computing Plan benefits and employee contributions and employer contributions. For those participating in Social Security, the compensation cap is \$117,020 for calendar year 2016. For those not participating in Social Security, the compensation cap is \$140,424 for calendar year 2016. In addition, it is possible that some sources of compensation, such as any payments deemed to be terminal or special pays, may be excluded from the benefit and contribution computations for PEPRA members.

Credited Service: In general, Credited Service is earned for the period during which Member Contributions are paid. Since Tier 3 Members participate in a non-contributory Plan, their Credited Service is calculated based on their date of Membership only.

Temporary service for which the Member was not credited, or service for which the Member withdrew his or her Member Contributions, may be purchased by paying or repaying the Member Contributions with interest. The categories of services that credit may be purchased for are listed below:

- **Prior Part-time Service**: If a Member worked for an employer within the Association on a part-time or 'extra help' basis before his membership in the Retirement Association, the Member may buyback this service.
- Intermittent Part-time Service



APPENDIX C – SUMMARY OF PLAN PROVISIONS

- **Prior full time Service:** Member may buyback full time service that may have been cashed out upon termination.
- Leave of Absence (Including absence with State Disability or Worker's Compensation): No unpaid leave of absence can be bought back except for absence due to medical reasons of up to one year.
- **Public Service:** Only Tier 1 and 4 Members may buy back this service.
- **Military Time:** Only Tier 1 and 4 Members may buy back this service.
- Enhance Prior Tier Service: Applies to certain active and deferred Members with Tier 1, 2 or 3 service.
- Military "call up"
- **AB 2766:** Only Safety Employees can buy back this service.

A percentage of credited sick leave may be credited according to the Member's applicable bargaining unit.

Final

Compensation:

For Members belonging to Tier 2, Tier 3, and Tier 6, Final Compensation means the highest Compensation earned during any 36 consecutive months of the Member's employment. For all others, it is the highest Compensation earned during any twelve months of employment.

General Member: Any Member who is not a Safety Member is a General Member.

Safety Member: Any sworn Member engaged in law enforcement, probation, or fire suppression is a Safety Member.

B. Membership

Eligibility:

All full-time, permanent employees of Stanislaus County, City of Ceres, Stanislaus County Superior Court, Salida Sanitary District, East Side Mosquito Abatement, Keyes Community Services, Hills Ferry Cemetery, and StanCOG hired on or after October 1, 1988 become Members on their date of appointment. All others hired before October 1, 1988 became Members on the first day of the calendar month following their date of appointment.



APPENDIX C – SUMMARY OF PLAN PROVISIONS

Detailed membership eligibility according to Tier and membership date is shown in Table 1 on the following page.

C. Service Retirement

Eligibility:

New members who meet the requirements to enter a legacy tier under PEPRA will enter Tier 2; all other new members will enter Tier 6.

Tier 3 General Members are eligible to retire at age 55 if they have earned 10 years of Credited Service. Tier 6 (PEPRA) General Members are eligible to retire at age 52 if they have earned five years of Credited Service. All other General Members are eligible to retire at age 50 if they have earned five years of Credited Service and have been an Association member for at least 10 years. Alternatively, General non-PEPRA Members are eligible to retire at any age after having earned 30 years of Credited Service, or upon reaching age 70 with no service requirement.

Safety Members are eligible to retire at age 50 if they have earned five years of Credited Service and have been an Association member for at least 10 years. Alternatively, Safety Members are eligible to retire at any age after having earned 20 years of Credited Service, or upon reaching age 70 with no service requirement. The 20-year Credited Service retirement eligibility is not applicable to Tier 6 (PEPRA) Safety Members, nor is the 10-year Association membership requirement.

Benefit Amount: The Service Retirement Benefit payable to the Member is equal to the Member's Final Compensation multiplied by credited service, the benefit factor from Table 1 and the age factor from Table 2 corresponding to the Member's code section. The appropriate code sections for each group are listed in Table 1. For Tier 3 members, the age factors are applied after the benefit amount as determined under Table 1 has been offset by the designated fraction of the member's projected age 65 Social Security benefit.

> For Tier 3 Members with Credited Service up to 35 years, the percentage of Final Compensation may not exceed 70% and for those with more than 35 years, it may not exceed 80%. For all other non-PEPRA Members, the percentage of Final Compensation may not exceed 100%. For those members integrated with Social Security (other than Tiers 3 and 6), Retirement Benefits based on the first \$350 of monthly Final Average Compensation are reduced by one-third.



APPENDIX C – SUMMARY OF PLAN PROVISIONS

Table 1: Member Group Descriptions

	Open		Man	C. 1.		Top	
Group	or Closed	FAP	Max Cola	Code Section	Description	Retirement Factor Age	Benefit Factor
General Tier I	Closed	1	3	31676.12	2% at 57	62	2.00%
General Tier II	Open	3	3	31676.1	2% at 62	65	1.67%
General Tier III	Closed	3	0	31499.14	Non- Contributory	65	First 35 Years: 2.0% of FAS less 1/35 th of Social Security benefit at age 65. Next 10 Years: 1% of FAS
General Tier IV	Closed	1	3	31676.14	2% at 55	65	1.67%
General Tier V	Closed	1	3	31676.14	2% at 55	65	1.67%
General Tier VI	Open	3	3	7522.2	PEPRA	67	1.00%
Safety Tier II	Open	3	3	31664	2% at 50	50	2.00%
Safety Tier IV	Closed	1	3	31664.1	3% at 50	50	3.00%
Safety Tier V	Closed	1	3	31664.1	3% at 50	50	3.00%
Safety Tier VI	Open	3	3	7522.25 (2)	PEPRA	57	1.00%

Table 2: Age Factors

	Safety	Safety	Safety	General	General	General	General	General
Age	2% at Age 50 CERL §: 31664	3% at Age 50 CERL §: 31664.1	PEPRA GC §: 7522.25 Opt2	2% at Age 62 CERL §: 31676.1	2% at Age 57 CERL §: 31676.12	2% at Age 55 CERL §: 31676.14	2% at Age 65 CERL §: 31499.14	PEPRA GC §: 7522.20
41	0.6258	0.6258	N/A	N/A	N/A	N/A	N/A	N/A
42	0.6625	0.6625	N/A	N/A	N/A	N/A	N/A	N/A
43	0.7004	0.7004	N/A	N/A	N/A	N/A	N/A	N/A
44	0.7397	0.7397	N/A	N/A	N/A	N/A	N/A	N/A
45	0.7805	0.7805	N/A	N/A	N/A	N/A	N/A	N/A
46	0.8226	0.8226	N/A	N/A	N/A	N/A	N/A	N/A
47	0.8678	0.8678	N/A	N/A	N/A	N/A	N/A	N/A
48	0.9085	0.9085	N/A	N/A	N/A	N/A	N/A	N/A
49	0.9522	0.9522	N/A	N/A	N/A	N/A	N/A	N/A
50	1.0000	1.0000	2.0000	0.7091	0.6681	0.8850	N/A	N/A
51	1.0516	1.0000	2.1000	0.7457	0.7056	0.9399	N/A	N/A
52	1.1078	1.0000	2.2000	0.7816	0.7454	1.0000	N/A	1.0000
53	1.1692	1.0000	2.3000	0.8181	0.7882	1.0447	N/A	1.1000
54	1.2366	1.0000	2.4000	0.8556	0.8346	1.1048	N/A	1.2000
55	1.3099	1.0000	2.5000	0.8954	0.8850	1.1686	0.3900	1.3000
56	1.3099	1.0000	2.6000	0.9382	0.9399	1.2365	0.4300	1.4000
57	1.3099	1.0000	2.7000	0.9846	1.0000	1.3093	0.4700	1.5000
58	1.3099	1.0000	2.7000	1.0350	1.0447	1.3608	0.5100	1.6000
59	1.3099	1.0000	2.7000	1.0899	1.1048	1.4123	0.5600	1.7000
60	1.3099	1.0000	2.7000	1.1500	1.1686	1.4638	0.6100	1.8000
61	1.3099	1.0000	2.7000	1.1947	1.2365	1.5153	0.6700	1.9000
62	1.3099	1.0000	2.7000	1.2548	1.3093	1.5668	0.7400	2.0000
63	1.3099	1.0000	2.7000	1.3186	1.3093	1.5668	0.8200	2.1000
64	1.3099	1.0000	2.7000	1.3865	1.3093	1.5668	0.9000	2.2000
65	1.3099	1.0000	2.7000	1.4593	1.3093	1.5668	1.0000	2.3000
66	1.3099	1.0000	2.7000	1.4593	1.3093	1.5668	1.0000	2.4000
67	1.3099	1.0000	2.7000	1.4593	1.3093	1.5668	1.0000	2.5000

Form of Benefit:

The Service Retirement Benefit will be paid monthly beginning at retirement and for the life of the Member. If the member selects the unmodified benefit form, in the event of the Member's death 60% of the



APPENDIX C – SUMMARY OF PLAN PROVISIONS

benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. For Tier 3 Members, the benefit payable to beneficiary is limited to 50%. In the event there is no surviving spouse or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

Actuarially equivalent optional benefit forms are also available.

Annually on April 1, benefits for all retired members other than those in Tier 3 are adjusted to reflect changes in the CPI for the San Francisco Bay Area since the prior year. Benefits may be increased or decreased, but the cumulative changes shall never reduce the benefit below the original monthly allowance. Annual increases may not exceed the COLA figures shown in Table 1, but CPI increases above this figure are "banked" and used for future increases when the CPI increases by less than the figures shown.

In addition, ad hoc cost of living adjustments have been granted in the past and may be granted in the future.

A lump sum benefit of \$5,000 will be payable upon the death of a retired member. No death benefit is payable for Tier 3 retired members.

D. Service-Connected Disability:

Eligibility: All non-Tier 3 Members are eligible for Service-Connected Disability

Retirement benefits at any age if they are permanently disabled as a result of injuries or illness sustained in the line of duty. Tier 3 Members are not

eligible to receive disability benefits.

Benefit Amount: The Service-Connected Disability Retirement Benefit payable to Members

is equal to the greater of 50% of their Final Compensation or – if the Member is eligible at disability for a Service Retirement Benefit – the

Service Retirement Benefit accrued on the date of disability.

Form of Benefit: The Service-Connected Disability Retirement Benefit will be paid

monthly beginning at the effective date of disability retirement and for the life of the Member; in the event of the Member's death, 100% of the benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. In the event there is no surviving spouse or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's

designated beneficiary.



APPENDIX C – SUMMARY OF PLAN PROVISIONS

Actuarially equivalent optional benefit forms and COLA adjustments (as described for the Service Retirement benefit) are also available. A lump sum benefit of \$5,000 will be payable upon the death of the member.

E. Nonservice-Connected Disability

Eligibility:

Tier 3 Members are not eligible to receive disability benefits. All other Members are eligible for Nonservice-Connected Disability Retirement benefits if they are permanently disabled at any age after earning five years of Credited Service.

Benefit Amount: The Nonservice-Connected Disability Retirement Benefit payable to Tier 1 General Members is equal to the greatest of:

- 1.8% of Final Compensation at disability multiplied by years of Credited Service at disability;
- 1.8% of Final Compensation at disability multiplied by years of Credited Service projected to age 62, but not to exceed one-third of Final Compensation; or
- If the Member is eligible at disability for a Service Retirement Benefit, the Service Retirement Benefit accrued on the date of disability.

The Nonservice-Connected Disability Retirement Benefit payable to Tiers 2, 4, 5, and 6 General Members is equal to the greatest of:

- 1.5% of Final Compensation at disability multiplied by years of Credited Service at disability;
- 1.5% of Final Compensation at disability multiplied by years of Credited Service projected to age 65, but not to exceed one-third of Final Compensation; or
- If the Member is eligible at disability for a Service Retirement Benefit, the Service Retirement Benefit accrued on the date of disability.

The Nonservice-Connected Disability Retirement Benefit payable to Safety Members is equal to the greatest of:

- 1.8% of Final Compensation at disability multiplied by years of Credited Service at disability;
- 1.8% of Final Compensation at disability multiplied by years of Credited Service projected to age 55, but not to exceed one-third of Final Compensation; or
- If the Member is eligible at disability for a Service Retirement Benefit, the Service Retirement Benefit accrued on the date of disability.



APPENDIX C – SUMMARY OF PLAN PROVISIONS

Form of Benefit: The Nonservice-Connected Disability Retirement Benefit will be paid monthly beginning at the effective date of disability retirement, and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. In the event there is no surviving spouse or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

> Actuarially equivalent optional benefit forms and COLA adjustments (as described for the Service Retirement benefit) are also available. A lump sum benefit of \$5,000 will be payable upon the death of the member.

F. Death Benefit

Eligibility:

A Tier 3 Member's survivors are not eligible to receive death benefits. All other Members' survivors are eligible to receive different Death benefits dependent on the Member's cause of death and retirement eligibility.

Benefit Amount: In the event the Member's death resulted from injury or illness sustained in connection with the Member's duties, the Death Benefit payable to a surviving spouse, domestic partner, or eligible dependent children will be the greater of 50% of the Member's Final Compensation at the time of death or the Service Retirement Benefit.

> In the event the Member's death did not result from injury or illness sustained in connection with the Member's duties and at the time of death, the Member was eligible for Service Retirement or Non-Service Connected Disability (i.e. the employee was employed at least five years), the Death Benefit payable to the spouse, partner or children will be 60% of the survivor benefit based on benefit due on Member's date of death.

> In all other cases, the designated beneficiary (not necessarily a spouse/partner/child) will receive a refund of the Member's contributions with interest plus one month of Final Compensation for each year of service to a maximum of six years.

Form of Benefit: Annuity death benefits will be paid monthly beginning at the Member's death and for the life of the surviving spouse/partner or to the age of majority of dependent minor children if there is no spouse/partner. Lump sum benefits will be paid as described above.

> COLA adjustments (as described for the annuity benefits) are also available.



APPENDIX C – SUMMARY OF PLAN PROVISIONS

G. Withdrawal Benefits

Eligibility: Tier 3 Members are not eligible to receive withdrawal benefits. All other

Members are eligible for a Withdrawal Benefit upon termination of employment, if not eligible to receive or electing to waive a monthly

benefit.

Benefit Amount: The Withdrawal Benefit is a refund of the Member's accumulated

Contributions with interest. Upon receipt of the Withdrawal Benefit the

Member forfeits all Credited Service.

Form of Benefit: The Withdrawal Benefit is paid in a lump sum upon election by the

Member.

H. Deferred Vested Benefit

Eligibility: A Member is eligible for a Deferred Vested Benefit upon termination of

employment after earning five years of Credited Service, including reciprocity service from another system. For Tier 3 Members, the vesting

requirement is 10 years of Credited Service.

The Member must leave his or her Member Contributions with interest on

deposit with the Plan. This requirement does not apply to Tier 3 Members

since they participate in a non-contributory Plan.

Benefit Amount: The Deferred Vested Benefit is computed in the same manner as the

Service Retirement Benefit, but it is based on Credited Service and Final

Compensation on the date of termination.

Form of Benefit: The Deferred Vested Benefit will be paid monthly beginning at retirement

and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. For Tier 3 Members, the benefit payable to beneficiary is limited to 50%. In the event there is no surviving spouse or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the

Member's designated beneficiary.

Actuarially equivalent optional benefit forms and COLA adjustments (as described for the Service Retirement benefit) are also available. A lump sum benefit of \$5,000 will be payable upon the death of the member. No

death benefit is payable for Tier 3 retired members.



APPENDIX C – SUMMARY OF PLAN PROVISIONS

I. Reciprocal Benefit

Eligibility:

A Member is eligible for a Reciprocal Benefit upon termination of employment after earning five years of Credited Service and entry, within a specified period of time, into another retirement system recognized as a reciprocal system by the Plan. For Tier 3 Members, the vesting requirement is 10 years of Credited Service.

The Member must leave his or her Member Contributions with interest on deposit with the Plan. This requirement does not apply to Tier 3 Members since they participate in a non-contributory Plan.

Benefit Amount: The Reciprocal Benefit is computed in the same manner as the Service Retirement Benefit, but it is based on Credited Service on the date of termination and Final Compensation on the date of retirement; Final Compensation is based on the highest of the Compensation earned under this Plan or the reciprocal plan.

Form of Benefit: The Reciprocal Benefit will be paid monthly beginning at retirement and for the life of the Member; in the event of the Member's death, 60% of the benefit will continue for the life of the Member's spouse or to the age of majority of dependent minor children if there is no spouse. For Tier 3 Members, the benefit payable to beneficiary is limited to 50%. In the event there is no surviving spouse or minor children, any unpaid remainder of the Member's accumulated contributions will be paid to the Member's designated beneficiary.

> Actuarially equivalent optional benefit forms and COLA adjustments (as described for the Service Retirement benefit) are also available.

> A lump sum benefit of \$5,000 will be payable upon the death of the member. No death benefit is payable for Tier 3 retired members.

J. Optional Benefit Forms

Prior to retirement, a member may elect to convert his retirement allowance into a benefit of equivalent actuarial value in accordance with one of the optional forms described below.

- 1. A reduced retirement allowance payable during his life with the provision that on his death the excess, if any, of his accumulated deductions at the time of retirement over the annuity payments made to him will be paid to his designated beneficiary or estate; or
- 2. A reduced retirement allowance payable during his life with the provision that after his death the reduced allowance will be continued



APPENDIX C – SUMMARY OF PLAN PROVISIONS

for life to the beneficiary designated by him at the time of his retirement; or

3. A reduced retirement allowance payable during his life with the provision that after his death an allowance of one-half of his reduced allowance will be continued for life to the beneficiary designated by him at the time of his retirement.

In addition, a member participating in Social Security may elect to receive an increased monthly allowance before age 62 (earliest possible receipt of Social Security benefits) and then take a reduced monthly allowance at age 62 and after. This option will not affect any monthly payments payable to a beneficiary. This option is not available to those receiving a disability benefit.

K. Member Contributions

Other than Tiers 3 and 6, all Members contribute a percentage of Compensation to the Plan through payroll deduction. The percentage contributed depends on the Member's nearest age upon joining the Plan. Members do not contribute after earning 30 years of Credited Service.

Tier 6 (PEPRA) Members must contribute half of the Normal Cost of the Plan. Contributions for these members will be based on the Normal Cost associated with their benefits, including COLA; General and Safety members will pay different rates. Members will continue to contribute after earnings 30 years of service.

City of Ceres members in Tiers 1 and 4 pay the Tier 2 and 5 rates ("Full" rates), rather than the rates for their respective Tiers ("Half" rates).

Interest is credited semiannually to each Member's accumulated contributions. The crediting rate is set by the Board; the current annual rate is 0.25%.

The employee contribution rates are shown in the Appendix E.

L. Changes in Plan Provisions

No change



APPENDIX D – GLOSSARY

1. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs such as mortality, withdrawal, disability, retirement, changes in compensation and rates of investment return.

2. Actuarial Cost Method

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a Normal Cost and an Actuarial Liability.

3. Actuarial Gain (Loss)

The difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

4. Actuarial Liability

The portion of the Actuarial Present Value of Projected Benefits that will not be paid by future Normal Costs. It represents the value of the past Normal Costs with interest to the valuation date.

5. Actuarial Present Value (Present Value)

The value as of a given date of a future amount or series of payments. The Actuarial Present Value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made.

6. Actuarial Valuation

The determination, as of a specified date, of the Normal Cost, Actuarial Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

7. 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. The purpose of an Actuarial Value of Assets is to smooth out fluctuations in market values.



APPENDIX D – GLOSSARY

8. Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date, with each value based on the same set of actuarial assumptions.

9. Amortization Payment

The portion of the pension plan contribution, which is designed to pay interest and principal on the Unfunded Actuarial Liability in order to pay for that liability in a given number of years.

10. Entry Age Normal 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 of the individual between entry age and assumed exit ages.

11. Funded Ratio

The ratio of the Actuarial Value of Assets to the Actuarial Liability.

12. 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.

13. Projected Benefits

Those pension plan benefit amounts which are expected to be paid in the future under a particular set of Actuarial Assumptions, taking into account such items as increases in future compensation and service credits.

14. Unfunded Actuarial Liability

The excess of the Actuarial Liability over the Actuarial Value of Assets. The Unfunded Actuarial Liability is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling StanCERA's benefit obligation in the event of a plan termination or other similar action. However, it is an appropriate measure for assessing the need for or the amount of future contributions.



APPENDIX E – MEMBER CONTRIBUTION RATES

Employee Normal contribution rates vary by benefit formula as defined in the CERL and described in the table below, with the exception that City of Ceres members in Tiers 1 and 4 pay the Tier 2 and 5 rates ("Full" rates), rather than the rates for their respective Tiers ("Half" rates).

	Code	
Plan/Tier	Section	Member Contribution Provides Average Annuity
General Tier 1	31621.5	1/200th of Final Average Salary (FAS) at age 60
General Tier 2	31621	1/120th of Final Average Salary (FAS) at age 60
General Tier 3	NA	NA
General Tier 4	31621.3	1/240th of Final Average Salary (FAS) at age 55
General Tier 5	31621.9	1/120th of Final Average Salary (FAS) at age 55
Safety Tier 2	31639.25	1/100th of Final Average Salary (FAS) at age 50
Safety Tier 4	31639.5	1/200th of Final Average Salary (FAS) at age 50
Safety Tier 5	31639.25	1/100th of Final Average Salary (FAS) at age 50

Employee COLA contribution rates are determined based on 50% of the normal cost associated with the expected COLA benefits, including all forms of decrement and the value of any assumed joint and survivor benefits, determined for each individual entry age.

Similar to the benefit formulas, for those members integrated with Social Security (other than Tiers 3 and 6), contributions based on the first \$350 of monthly compensation are reduced by one-third.

The rates were changed following the Experience Study covering the period June 30, 2012 through June 30, 2015. The current employee contribution rates are shown in the following tables, and were determined based on the assumptions used in the current actuarial valuation. These assumptions include an interest rate of 7.25% per annum, an average salary increase of 3.25% per year (plus longevity and promotion increases), and the CalPERS mortality tables with adjustment as specified in the Appendix B and projected using Scale MP-2015 from 2009 to 2037 for General members and to 2039 for Safety members. The projection periods are based upon the duration of liabilities for the respective groups as of June 30, 2015. The rates are blended using a male/female weighting of 25% male / 75% female for General members, and 80% male / 20% female for Safety members. Basic and COLA rates were determined based on an assumption that members would cease making contributions after 30 years of service.

Employee contribution rates for Tier 6 (PEPRA) members are determined based on half the Normal Cost (including COLA) for the PEPRA members, computed separately for General and Safety members, and for County and Ceres / Other District members. Due to the passage of SB13, contribution rates for PEPRA members are not rounded, and are recomputed each year.

The member contribution rates shown in this appendix apply only to pensionable compensation (up to the PEPRA Compensation Limits for PEPRA members).



		General Tier 1		
Entry	Basic	Basic	COL	COL
Age	First \$350	Over \$350	First \$350	Over \$350
16	2.26%	3.40%	1.12%	1.68%
17	2.26%	3.40%	1.12%	1.68%
18	2.26%	3.40%	1.12%	1.68%
19	2.26%	3.40%	1.12%	1.68%
20	2.26%	3.40%	1.12%	1.68%
21	2.28%	3.42%	1.15%	1.73%
22	2.30%	3.45%	1.18%	1.77%
23	2.31%	3.47%	1.21%	1.81%
24	2.33%	3.49%	1.23%	1.85%
25	2.34%	3.51%	1.27%	1.90%
26	2.35%	3.52%	1.29%	1.94%
27	2.35%	3.53%	1.33%	1.99%
28	2.36%	3.54%	1.36%	2.04%
29	2.36%	3.54%	1.39%	2.08%
30	2.36%	3.54%	1.42%	2.13%
31	2.41%	3.61%	1.45%	2.18%
32	2.46%	3.69%	1.49%	2.23%
33	2.51%	3.76%	1.52%	2.28%
34	2.56%	3.83%	1.56%	2.34%
35	2.61%	3.91%	1.60%	2.40%
36	2.66%	3.99%	1.65%	2.47%
37	2.71%	4.06%	1.69%	2.54%
38	2.76%	4.14%	1.74%	2.61%
39	2.82%	4.22%	1.79%	2.68%
40	2.87%	4.31%	1.83%	2.75%
41	2.93%	4.39%	1.87%	2.80%
42	2.99%	4.48%	1.90%	2.85%
43	3.05%	4.57%	1.93%	2.90%
44	3.11%	4.66%	1.97%	2.95%
45	3.17%	4.75%	1.99%	2.99%
46	3.23%	4.85%	2.03%	3.04%
47	3.30%	4.95%	2.05%	3.08%
48	3.37%	5.05%	2.08%	3.12%
49	3.44%	5.16%	2.09%	3.14%
50	3.52%	5.28%	2.11%	3.16%
51	3.60%	5.40%	2.11%	3.17%
52	3.68%	5.52%	2.09%	3.13%
53	3.75%	5.63%	2.05%	3.07%
54	3.82%	5.73%	2.01%	3.02%
55	3.88%	5.82%	1.97%	2.96%
56	3.92%	5.88%	1.91%	2.86%
57	3.93%	5.89%	1.78%	2.67%
58	3.78%	5.67%	1.75%	2.62%
59+	3.74%	5.61%	1.71%	2.57%



	General Tier 2					
Entry	Basic	Basic	COL	COL		
Age	First \$350	Over \$350	First \$350	Over \$350		
16	3.56%	5.33%	0.91%	1.36%		
17	3.56%	5.33%	0.91%	1.36%		
18	3.56%	5.33%	0.91%	1.36%		
19	3.56%	5.33%	0.91%	1.36%		
20	3.56%	5.33%	0.91%	1.36%		
21	3.58%	5.38%	0.93%	1.39%		
22	3.61%	5.41%	0.95%	1.42%		
23	3.63%	5.45%	0.97%	1.45%		
24	3.65%	5.48%	0.99%	1.48%		
25	3.67%	5.51%	1.01%	1.51%		
26	3.69%	5.53%	1.03%	1.55%		
27	3.70%	5.55%	1.06%	1.59%		
28	3.71%	5.56%	1.09%	1.63%		
29	3.71%	5.56%	1.11%	1.66%		
30	3.71%	5.57%	1.13%	1.70%		
31	3.78%	5.68%	1.16%	1.74%		
32	3.86%	5.79%	1.19%	1.79%		
33	3.94%	5.90%	1.23%	1.84%		
34	4.01%	6.02%	1.25%	1.88%		
35	4.09%	6.14%	1.29%	1.93%		
36	4.17%	6.26%	1.33%	1.99%		
37	4.25%	6.38%	1.36%	2.04%		
38	4.34%	6.51%	1.40%	2.10%		
39	4.42%	6.64%	1.43%	2.15%		
40	4.51%	6.77%	1.47%	2.21%		
41	4.60%	6.90%	1.50%	2.25%		
42	4.69%	7.04%	1.53%	2.29%		
43	4.78%	7.17%	1.55%	2.33%		
44	4.88%	7.32%	1.57%	2.36%		
45	4.98%	7.46%	1.60%	2.40%		
46	5.08%	7.62%	1.62%	2.43%		
47	5.18%	7.77%	1.65%	2.47%		
48	5.29%	7.94%	1.67%	2.51%		
49	5.40%	8.11%	1.69%	2.54%		
50	5.52%	8.28%	1.71%	2.57%		
51	5.63%	8.45%	1.73%	2.59%		
52	5.74%	8.61%	1.73%	2.60%		
53	5.83%	8.75%	1.73%	2.60%		
54	5.90%	8.85%	1.73%	2.59%		
55	5.94%	8.91%	1.70%	2.55%		
56	5.94%	8.90%	1.64%	2.46%		
57	5.90%	8.85%	1.54%	2.31%		
58	6.03%	9.04%	1.51%	2.26%		
59+	6.24%	9.36%	1.48%	2.22%		



		General Tier 4		
Entry	Basic	Basic	COL	COL
Age	First \$350	Over \$350	First \$350	Over \$350
16	2.05%	3.07%	1.21%	1.81%
17	2.05%	3.07%	1.21%	1.81%
18	2.05%	3.07%	1.21%	1.81%
19	2.05%	3.07%	1.21%	1.81%
20	2.05%	3.07%	1.21%	1.81%
21	2.05%	3.08%	1.24%	1.86%
22	2.06%	3.09%	1.27%	1.90%
23	2.06%	3.10%	1.30%	1.95%
24	2.07%	3.10%	1.33%	1.99%
25	2.07%	3.10%	1.35%	2.03%
26	2.11%	3.16%	1.39%	2.08%
27	2.15%	3.23%	1.41%	2.12%
28	2.19%	3.29%	1.44%	2.16%
29	2.24%	3.35%	1.47%	2.20%
30	2.28%	3.42%	1.50%	2.25%
31	2.33%	3.49%	1.53%	2.30%
32	2.37%	3.56%	1.57%	2.35%
33	2.42%	3.63%	1.61%	2.41%
34	2.47%	3.70%	1.65%	2.47%
35	2.51%	3.77%	1.69%	2.53%
36	2.56%	3.84%	1.73%	2.60%
37	2.61%	3.92%	1.78%	2.67%
38	2.67%	4.00%	1.83%	2.74%
39	2.72%	4.08%	1.87%	2.81%
40	2.77%	4.16%	1.93%	2.89%
41	2.83%	4.24%	1.96%	2.94%
42	2.89%	4.33%	1.99%	2.98%
43	2.95%	4.42%	2.02%	3.03%
44	3.01%	4.52%	2.05%	3.07%
45	3.08%	4.62%	2.07%	3.11%
46	3.15%	4.72%	2.10%	3.15%
47	3.22%	4.83%	2.11%	3.17%
48	3.29%	4.93%	2.13%	3.20%
49	3.35%	5.02%	2.14%	3.21%
50	3.40%	5.10%	2.14%	3.21%
51	3.43%	5.14%	2.13%	3.20%
52	3.44%	5.16%	2.11%	3.16%
53 5.1	3.31%	4.96%	2.06%	3.09%
54+	3.28%	4.91%	2.03%	3.05%



		General Tier 5		
Entry	Basic	Basic	COL	COL
Age	First \$350	Over \$350	First \$350	Over \$350
16	4.09%	6.14%	1.21%	1.81%
17	4.09%	6.14%	1.21%	1.81%
18	4.09%	6.14%	1.21%	1.81%
19	4.09%	6.14%	1.21%	1.81%
20	4.09%	6.14%	1.21%	1.81%
21	4.11%	6.16%	1.24%	1.86%
22	4.12%	6.18%	1.27%	1.90%
23	4.13%	6.19%	1.30%	1.95%
24	4.13%	6.20%	1.33%	1.99%
25	4.14%	6.20%	1.35%	2.03%
26	4.22%	6.33%	1.39%	2.08%
27	4.30%	6.45%	1.41%	2.12%
28	4.39%	6.58%	1.44%	2.16%
29	4.47%	6.71%	1.47%	2.20%
30	4.56%	6.84%	1.50%	2.25%
31	4.65%	6.98%	1.53%	2.30%
32	4.74%	7.11%	1.57%	2.35%
33	4.84%	7.25%	1.61%	2.41%
34	4.93%	7.40%	1.65%	2.47%
35	5.03%	7.54%	1.69%	2.53%
36	5.13%	7.69%	1.73%	2.60%
37	5.23%	7.84%	1.78%	2.67%
38	5.33%	8.00%	1.83%	2.74%
39	5.44%	8.16%	1.87%	2.81%
40	5.55%	8.32%	1.93%	2.89%
41	5.66%	8.49%	1.96%	2.94%
42	5.78%	8.66%	1.99%	2.98%
43	5.90%	8.84%	2.02%	3.03%
44	6.02%	9.03%	2.05%	3.07%
45	6.16%	9.23%	2.07%	3.11%
46	6.30%	9.45%	2.10%	3.15%
47	6.44%	9.65%	2.11%	3.17%
48	6.57%	9.86%	2.13%	3.20%
49	6.69%	10.04%	2.14%	3.21%
50	6.80%	10.19%	2.14%	3.21%
51	6.86%	10.29%	2.13%	3.20%
52	6.88%	10.31%	2.11%	3.16%
53	6.62%	9.93%	2.06%	3.09%
54+	6.55%	9.83%	2.03%	3.05%



		Safety Tier 2		
Entry	Basic	Basic	COL	COL
Age	First \$350	Over \$350	First \$350	Over \$350
20	4.90%	7.35%	1.83%	2.75%
21	5.00%	7.50%	1.91%	2.87%
22	5.10%	7.65%	1.97%	2.96%
23	5.21%	7.81%	2.04%	3.06%
24	5.31%	7.97%	2.10%	3.15%
25	5.42%	8.13%	2.17%	3.25%
26	5.53%	8.29%	2.23%	3.35%
27	5.64%	8.46%	2.30%	3.45%
28	5.75%	8.63%	2.37%	3.55%
29	5.87%	8.81%	2.44%	3.66%
30	5.99%	8.99%	2.52%	3.78%
31	6.12%	9.18%	2.60%	3.90%
32	6.24%	9.37%	2.68%	4.02%
33	6.38%	9.56%	2.77%	4.15%
34	6.51%	9.77%	2.84%	4.26%
35	6.65%	9.98%	2.92%	4.38%
36	6.80%	10.20%	2.99%	4.48%
37	6.95%	10.42%	3.05%	4.58%
38	7.10%	10.64%	3.13%	4.69%
39	7.23%	10.85%	3.21%	4.81%
40	7.36%	11.05%	3.30%	4.95%
41	7.49%	11.23%	3.34%	5.01%
42	7.61%	11.41%	3.37%	5.06%
43	7.70%	11.55%	3.41%	5.11%
44	7.76%	11.64%	3.43%	5.14%
45	7.77%	11.66%	3.43%	5.15%
46	7.74%	11.60%	3.46%	5.19%
47	7.65%	11.48%	3.48%	5.22%
48	7.83%	11.75%	3.50%	5.25%
49+	8.10%	12.15%	3.52%	5.28%



	Safety Tier 4				
Entry	Basic	Basic	COL	COL	
Age	First \$350	Over \$350	First \$350	Over \$350	
20	2.59%	3.89%	2.49%	3.74%	
21	2.64%	3.97%	2.60%	3.90%	
22	2.70%	4.05%	2.68%	4.02%	
23	2.75%	4.13%	2.75%	4.13%	
24	2.81%	4.21%	2.83%	4.24%	
25	2.87%	4.30%	2.90%	4.35%	
26	2.92%	4.39%	2.97%	4.46%	
27	2.98%	4.47%	3.05%	4.57%	
28	3.04%	4.57%	3.12%	4.68%	
29	3.11%	4.66%	3.19%	4.79%	
30	3.17%	4.75%	3.23%	4.85%	
31	3.24%	4.85%	3.28%	4.92%	
32	3.30%	4.95%	3.35%	5.03%	
33	3.37%	5.06%	3.43%	5.14%	
34	3.44%	5.17%	3.51%	5.26%	
35	3.52%	5.28%	3.59%	5.39%	
36	3.60%	5.39%	3.66%	5.49%	
37	3.68%	5.52%	3.74%	5.61%	
38	3.76%	5.65%	3.83%	5.74%	
39	3.85%	5.77%	3.92%	5.88%	
40	3.93%	5.89%	4.03%	6.04%	
41	4.00%	6.00%	4.02%	6.03%	
42	4.07%	6.11%	4.01%	6.02%	
43	4.15%	6.22%	4.02%	6.03%	
44	4.22%	6.33%	4.02%	6.03%	
45	4.26%	6.39%	4.02%	6.03%	
46	4.28%	6.42%	4.05%	6.07%	
47	4.27%	6.41%	4.07%	6.10%	
48	4.11%	6.17%	4.09%	6.13%	
49+	4.05%	6.08%	4.11%	6.16%	



	Safety Tier 5				
Entry	Basic	Basic	COL	COL	
Age	First \$350	Over \$350	First \$350	Over \$350	
20	5.18%	7.78%	2.49%	3.74%	
21	5.29%	7.93%	2.60%	3.90%	
22	5.40%	8.10%	2.68%	4.02%	
23	5.51%	8.26%	2.75%	4.13%	
24	5.62%	8.43%	2.83%	4.24%	
25	5.73%	8.60%	2.90%	4.35%	
26	5.85%	8.77%	2.97%	4.46%	
27	5.97%	8.95%	3.05%	4.57%	
28	6.09%	9.13%	3.12%	4.68%	
29	6.21%	9.32%	3.19%	4.79%	
30	6.34%	9.51%	3.23%	4.85%	
31	6.47%	9.71%	3.28%	4.92%	
32	6.60%	9.91%	3.35%	5.03%	
33	6.74%	10.12%	3.43%	5.14%	
34	6.89%	10.33%	3.51%	5.26%	
35	7.04%	10.56%	3.59%	5.39%	
36	7.19%	10.79%	3.66%	5.49%	
37	7.36%	11.03%	3.74%	5.61%	
38	7.53%	11.29%	3.83%	5.74%	
39	7.69%	11.54%	3.92%	5.88%	
40	7.85%	11.78%	4.03%	6.04%	
41	8.00%	12.00%	4.02%	6.03%	
42	8.15%	12.22%	4.01%	6.02%	
43	8.29%	12.44%	4.02%	6.03%	
44	8.43%	12.65%	4.02%	6.03%	
45	8.52%	12.78%	4.02%	6.03%	
46	8.56%	12.84%	4.05%	6.07%	
47	8.54%	12.81%	4.07%	6.10%	
48	8.22%	12.33%	4.09%	6.13%	
49+	8.10%	12.15%	4.11%	6.16%	



			PEPRA Rates			
		Gen	eral	Safety		
		County and	Ceres and	County and	Ceres and	
		Former County	Other Districts	Former County	Other Districts	
		8.06%	8.55%	13.07%	14.29%	
Assumptions	3:					
	Interest:	7.25%				
	Salary:	2015 Valuation Scale (Service based, includes wage inflation at 3.25%)				
	Mortality:	Because the PEPRA contributions rates are based on 50% of the actual Normal Cost, the mortality rates are the same as those used in the Actuarial Valuation (CalPERS mortality tables with adjustments based on StanCERA experience projected generationally from 2009 using Scale MP-2015)				

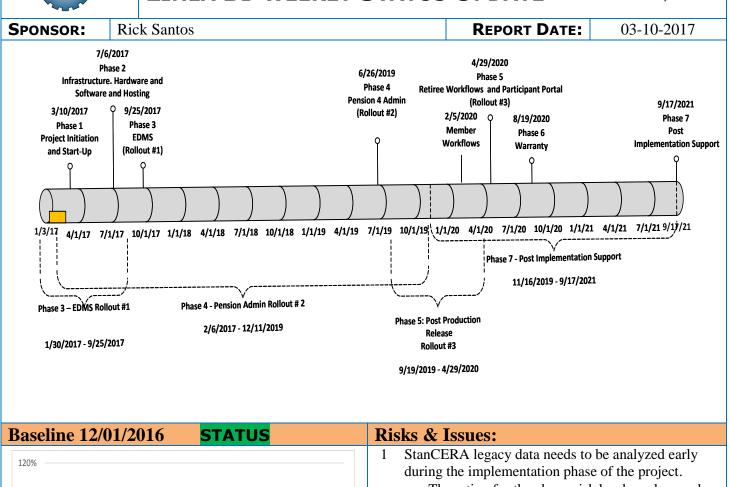


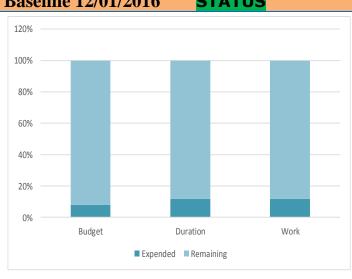




PAS IMPLEMENTATION LINEA BI-WEEKLY STATUS UPDATE







- The rating for the above risk has been lowered from high to low after further discussions with the StanCERA management. The mitigation strategy for the risk has been revised.
- 2 StanCERA needs to develop a communication plan for the external entities such as employers and vendors.
 - The rating for the above risk has been lowered from high to low after further discussions with the StanCERA management. The mitigation strategy for the risk has been revised.

Accomplishments: Upcoming:

- ➤ Completed review and provided comments on the Tegrit Phase 3 Statement of Work.
- Completed review and provided comments on the Backfile Methodology document.
- Facilitated the weekly PM meeting.
- Participated in Tegrit work sessions conducted by Paul Booth, Project Risk meetings, and several ad-hoc meetings or discussions.

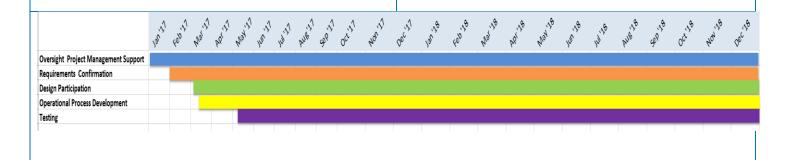
Accomplishments: (Contd.)

- Reviewed Tegrit meeting minutes, decision logs, and action items, as needed.
- Compiled project decisions and action items generated during meetings for tracking purposes.
- Researched and communicated information in fulfillment of action items identified in meetings.
- Tracked requirements discussed in work sessions using the RTM.
- Began working with Tegrit and StanCERA through meetings and discussions to define the vision and communication plans for employer reporting.

- ➤ Participate in multiple Tegrit work sessions and/or other meetings scheduled each week.
- ➤ Continue tracking requirements discussed in work sessions using the RTM.
- > Continue to review Tegrit meeting minutes, decision logs, and action items, as needed.
- Continue to compile and track decisions and action items generated during meetings.

Upcoming: (Contd.)

- ➤ Work with Paul Booth to refine document inventory and associate with RFP requirements for ECM development.
- Assist StanCERA, as needed, with executing their plan to manifest paper files for back file conversion and other back file preparation tasks.
- Complete work on project timeline graphic for office now that the overall project schedule has been completed.



From: RETIREMENT
To: Santos, Rick
CC: Kellie Gomes

Date: 3/16/2017 11:12 AM

Subject: Fwd: ATTN: Rick Santos - SACRS Board of Director's Outreach Program

Rick,

I hope this email finds you doing well. I am following up on our conversation.

As you know, I am the Vice President of SACRS and the Safety Trustee for CCCERA. I would like to be placed on your April 25, 2017 Board of Trustees' meeting agenda to discuss SACRS.

The purpose of my appearance is to have a very frank and open talk about SACRS. I am conducting what I call a SACRS Board of Director's Outreach Program. So far, I have attended the Board of Trustees' meetings at Alameda, Mendocino, San Mateo and Sonoma Counties.

I want to hear from your Staff and Trustees about what they like, do not like and possible improvements regarding SACRS and our conferences.

Again, this is a very informal conversation and should take no more than 15 minutes depending on how many questions or concerns your Board has.

Typical concerns that I have addressed so far are the length, location and the amount of marketers in regards to our conferences. There have also been concerns about the controversy we had at the 2015 Spring Conference Business Meeting with the Board of Director's elections which I can address as well should this concern arise.

I want to instill with all members of SACRS that our organization is only as good as us members make it. The feedback I have gotten so far has been shared with the SACRS BOD's and we have been able to address a lot of the issues.

I also want to assist any members of your System who want to get involved with SACRS such as becoming members of the various SACRS Committees.

I look forward to hearing back from you. Sincerely,
Gabe Rodrigues