Pension Trust

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(805) 781-5465 Phone
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www.SLOPensionTrust.org

San Luis Obispo County
Pension Trust
SLOCPT

AGENDA

Monday, March 26, 2018 9:30 AM
Board of Supervisors Chambers
County Government Center
San Luis Obispo, CA 93408

PENSION TRUST BOARD OF TRUSTEES

Materials for the meeting may be found at
http://www.slocounty.ca.gov/Departments/Pension-Trust/Board-of-Trustees

PUBLIC COMMENT

1. Public Comment: Members of the public wishing to address the Board on matters other than scheduled items may do so when recognized by the Chair. Presentations are limited to three minutes per individual.

ORGANIZATIONAL

None

CONSENT

2. Minutes of the Regular Meeting of February 26, 2018 (Approve Without Correction).

3. Report of Deposits and Contributions for the month of February 2018 (Receive and File).

4. Report of Service Retirements, Disability Retirements and DROP Participants for the month of February (Receive, Approve and File).

5. Applications & Elections to participate in the Deferred Retirement Option Program (DROP) received through March 9, 2018 (Receive, Approve and File).

APPLICATIONS FOR DISABILITY RETIREMENT

6. Application for Industrial Disability Retirement (Case 2018-02) (Recommend Approval).

OLD BUSINESS

None

NEW BUSINESS

7. 2017 Actuarial Audit – Final Report – Bartel Associates (Receive, Approve and File).

8. Employer Contributions Prefunding (Discuss, Direct Staff as necessary).

INVESTMENTS

9. TAO Contingency Fund – Opportunistic – Preliminary Recommendation - (Review, Discuss, and Direct Staff as necessary).

10. Monthly Investment Report for February 2018 (Receive and File).

11. Asset Allocation - (Review, Discuss, and Direct Staff as necessary).

OPERATIONS

12. Staff Reports

13. General Counsel Reports

14. Committee Reports:

a. Audit Committee	No Report
b. Personnel Committee	No Report
c. PAS Replacement Committee	No Report

15. Upcoming Board Topics (subject to change):

    a. April 23, 2018
        i. Disability case(s)
        ii. Pension Trust FY18-19 Budget – preliminary
        iii. Fiduciary Refresher Training
        iv. Conflict of Interest Policy biennial review
        v. TAO Contingency Fund Recommendation
        vi. TAO Contingency Fund Indemnification Authorization

    b. May 21, 2018
        i. Pension Trust FY18-19 Budget – approval
        ii. 2017 Actuarial Audit – GRS comments and adjustments
        iii. 2018 Actuarial Experience Study Report
        iv. Actuarial Assumptions for 2018 Valuation
        v. Quarterly Investment Report for 1Q18
        vi. Investment presentations by Verus, Investment Consultant

    c. June 25, 2018
        i. Audit Report – 2017 – Brown Armstrong
        ii. CAFR – 2017
        iii. 2018 Actuarial Valuation and Contribution Rates
        iv. Prefunding Employer Contributions FY18-19

16. Trustee Comments

REFERRED ITEMS

None

ADDED ITEMS

None

CLOSED SESSION

None

ADJOURNMENT

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Board of Trustees

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San Luis Obispo County Pension Trust
SLOCPT

FEBRUARY 26, 2018
MINUTES
OF THE REGULAR MEETING OF THE PENSION TRUST
BOARD OF TRUSTEES

BOARD MEMBERS PRESENT:	**Matt Janssen, President** **Gere Sibbach** **Jim Hamilton** **Jim Erb** **Jeff Hamm**
BOARD MEMBERS ABSENT:	**Will Clemens, Vice President** **Guy Savage**
STAFF:	**Carl Nelson** **Andrea Paley** **Amy Burke**
COUNSEL:	**Chris Waddell, Esq.**
CONSULTANTS:	**Scott Whalen, Verus** **Paul Wood, Actuary Gabriel Roeder Smith**
OTHERS:	**Larry Batcheldor, SLOCREA** **Jennifer Alderete, Pension Trust** **Lisa Winters, Pension Trust** **Susan Pittaway, DROP Applicant** **Michael Hobbs, Human Resources**

The meeting was called to order by President Janssen at 9:33 AM, who presided over same.

AGENDA ITEM NO. 1: PUBLIC COMMENT.

None.

ORGANIZATIONAL:

None.

CONSENT:

AGENDA ITEM NO. 2 - 5 CONSENT.

Upon the motion of Mr. Hamm, seconded by Mr. Janssen, and unanimously passed, the following action was taken:

ITEM 2: The Minutes of the Regular Meeting of January 22, 2018 were approved without correction.

ITEM 3: The Report of Deposits and Contributions for the Month of January 2018, was received and filed.

ITEM 4: The Report of Service Retirements, Disability and DROP Retirements for the month of January 2018, was received, approved and filed.

ITEM 5: The Report of Applications for participation in the Deferred Retirement Option Program received through February 9, 2018 was received, approved and filed.

APPLICATIONS FOR DISABILITY RETIREMENT:

To be discussed in Closed Session Agenda Item No. 19.

OLD BUSINESS:

None.

NEW BUSINESS:

AGENDA ITEM NO. 6: PENSION TRUST STAFFING & APPROVAL OF RETIREMENT TECHNICIAN JOB SPECIFICATION.

On February 9, 2018 the Personnel Committee met with Pension Trust Executive staff to discuss staff needs as a result of two positions becoming vacant.

Upon the motion of Mr. Erb, seconded by Mr. Hamm, and unanimously passed staff recommendations as follows:

1) To retain three Retirement Program Specialists for primary customer service (reduced down from the 4 positions budgeted); and
2) Approve the new Retirement Technician job specification, benchmarked to the SLO County Accounting Technician-Confidental position. Add a Retirement Technician to the staff budget to act as an administrative paraprofessional to support Retirement Program Specialist staff; and
3) Reclassify the existing Accounting Technician position to a Retirement Technician; and
4) Eliminate the budgeted System Coordinator position; and
5) Incorporate the above-mentioned changes into the Fiscal Year 2018/2019 Administrative Budget to be reviewed and approved at the Regular Meeting held in April 2018.

AGENDA ITEM NO. 7: APPROVAL OF ANNUAL COST-OF-LIVING ADJUSTMENT FOR RETIREES.

Upon the motion of Mr. Erb, seconded by Mr. Hamm, and unanimously passed, the Cost-of-Living Adjustments effective April 1, 2018 for Retirees and Beneficiaries and DROP Participants as provided for in Article 19: Sections 19.01 and 19.02, Article 27, 30 and 31; Sections 30.25 and 31.24 and recommended by the Pension Trust Actuary for COLA Groups as follows:

TIER 1	
Retired on or before January 1,1981	3.0% effective 04-01-2018
Retired 01-02-1981 through January 1, 2018	2.8% effective 04-01-2018
TIER 2 & 3	
Retired on or before January 1, 2018	2.0% effective 04-01-2018

AGENDA ITEM NO. 8: ACTUARIAL EXPERIENCE STUDY & VALUATION – PLANNING & PROCESS.

Mr. Paul Wood, actuary, from Gabriel Roeder Smith made a presentation on the 2018 actuarial experience study and annual actuarial valuation process. He took questions from staff and the Board. No action was required at this time.

Upon the motion of Mr. Hamm, seconded by Mr. Sibbach, and unanimously passed the Gabriel Roeder Smith presentation report was received and filed.

INVESTMENTS:

AGENDA ITEM NO. 9: 4TH QUARTER 2017 INVESTMENT REPORT.

Mr. Scott Whalen, Investment Consultant from Verus presented the 2017 4th quarter market commentary and Pension Trust Investment Portfolio results. He took questions from the Board and Staff.

Upon the motion of Mr. Janssen, seconded by Mr. Erb, and unanimously passed, the 2017 4th Quarter Investment Report from Verus was received and filed.

AGENDA ITEM NO. 10: MONTHLY INVESTMENT REPORT JANUARY 2018.

Upon the motion of Mr. Sibbach, seconded by Mr. Janssen, and unanimously passed, the Investment Report for the period ended January 31, 2018 was received and filed.

AGENDA ITEM NO. 11: CAPITAL MARKET EXPECTATIONS, ASSET ALLOCATION POLICY.

Mr. Scott Whalen, Investment Consultant from Verus presented the 2018 Capital Market Expectations and Asset Allocation Review. No changes to asset allocation policy were recommended. He took questions from the Board and Staff.

Upon the motion of Mr. Hamm, seconded by Mr. Hamilton, and unanimously passed, the presentation on capital market expectations and Pension Trust asset allocation policy by Scott Whalen, Investment Consultant from Verus was received and filed.

AGENDA ITEM NO. 12: RETIREMENT PLAN PEER COMPARISIONS.

Upon the motion of Mr. Janssen, seconded by Mr. Sibbach, and unanimously passed, the Report on Retirement Plan Peer Comparisions was received and filed.

AGENDA ITEM NO. 13: ASSET ALLOCATION.

Staff reported that no action regarding investment asset allocations were necessary at this time.

OPERATIONS:

AGENDA ITEM NO. 14: STAFF ORAL REPORTS.

A) Staff informed that the audit is scheduled for the first week in April and the Audit Committee would meet with the auditors that week – time TBD.

B) Staff provided an update on the status on the medical insurance transition with the County.

C) Staff will be sending an item to the Board of Supervisors agenda regarding contribution rate adjustments for APCD and LAFCO.

D) Staff advised they have received a copy of the final draft of the Bartel report on the actuarial audit.

E) Staff informed that Pension Trust real property holdings has only three buildings remaining and are all currently on the market.

F) Staff reminded Trustees of AB1234 training requirements and filing Form 700 deadlines looming.

AGENDA ITEM NO. 15: GENERAL COUNSEL ORAL REPORTS.

Nothing to report.

AGENDA ITEM NO. 16: COMMITTEE REPORTS – AS NEEDED.

A) AUDIT COMMITTEE: Nothing to report

B) PERSONNEL COMMITTEE: see Agenda Item No. 6.

C) PENSION ADMINISTRATION SYSTEM ADMINISTRATION (PASR) COMMITTEE: Nothing to report.

AGENDA ITEM NO. 17: UPCOMING BOARD TOPICS.

The planned topics for the next three board meetings were included in the agenda summary. This is an information item, nothing further to report.

AGENDA ITEM NO. 18: TRUSTEE COMMENTS.

Nothing to report.

REFERRED ITEMS: None.

ADDED ITEMS: None.

** 11:45 AM – A recess was called at this time

** 1:00 PM – The meeting resumed at this time in room D361.

CLOSED SESSION:

****** Entered into Closed Session at 1:04 PM

****** Returned to Open Session at 2:51 PM

AGENDA ITEM NO. 19: APPLICATION FOR INDUSTRIAL DISABILITY RETIREMENT CASE NO. 2017-03.

President Janssen reported that the Board of Trustees, through a unanimous roll-call vote, approved the recommendation of the referee retained to conduct a hearing on Industrial Disability Case No. 2017-03 to deny the application by a Deputy Sheriff for Industrial Disability Retirement.

ADJOURNMENT.

There being no further business, the meeting was adjourned at 2:51 PM. The next Regular Meeting was set for March 26, 2018, at 9:30 AM, in the Board of Supervisors Chambers, New County Government Center, San Luis Obispo, California 93408.

Respectfully submitted,

Carl Nelson
Executive Secretary

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REPORT OF DEPOSITS AND CONTRIBUTIONS FOR THE MONTH OF FEBRUARY 2018

PP 3 2/2/2018 By Employer and Tier:	Pensionable Salary	Employer Contributions	Employer Rate	Employee Contributions	Employer for Employee Contributions	Employee Rate	Combined Rate	Additional Contributions	Buy Backs	TOTAL Contributions
County Tier 1	3,968,391.64	926,274.31	23.34%	452,968.69	338,656.80	19.95%	43.29%	1,537.50	706.22	**1,720,143.52**
County Tier 2	931,838.58	222,212.94	23.85%	39,399.36	78,596.30	12.66%	36.51%	67.90	709.70	**340,986.20**
County Tier 3	2,211,802.09	490,246.36	22.17%	257,295.53	-	11.63%	33.80%	-	832.64	**748,374.53**
Superior Court Tier 1	276,364.09	72,034.75	25.06%	44,899.73	-	16.25%	41.31%	-	-	**116,934.48**
Superior Court Tier 3	56,150.50	16,505.65	28.55%	4,998.43	-	8.90%	37.46%	-	114.54	**21,618.62**
APCD Tier 1	69,253.39	14,528.28	20.98%	8,122.06	4,634.10	18.42%	39.40%	-	-	**27,284.44**
APCD Tier 3	10,580.80	2,182.16	20.62%	1,095.10	-	10.35%	30.97%	-	-	**3,277.26**
Pension Trust Staff Tier 1	7,168.55	1,647.33	22.98%	873.13	665.96	21.47%	44.45%	-	-	**3,186.42**
Pension Trust Staff Tier 2	7,936.80	1,823.87	22.98%	210.33	737.33	11.94%	34.92%	-	-	**2,771.53**
Pension Trust Staff Tier 3	8,606.05	1,935.51	22.49%	1,104.98	-	12.84%	35.33%	-	-	**3,040.49**
LAFCO Tier 1	12,494.29	3,378.46	27.04%	677.19	1,448.97	17.02%	44.06%	-	-	**5,504.62**
	7,560,586.78	1,752,769.62	23.18%	811,644.53	424,739.46	16.35%	39.54%	1,605.40	2,363.10	**$ 2,993,122.11**

PP 4 2/16/2018 By Employer and Tier:	Pensionable Salary	Employer Contributions	Employer Rate	Employee Contributions	Employer for Employee Contributions	Employee Rate	Combined Rate	Additional Contributions	Buy Backs	TOTAL Contributions
County Tier 1	3,965,905.44	925,675.61	23.34%	452,657.43	338,727.43	19.95%	43.30%	1,537.50	706.22	**1,719,304.19**
County Tier 2	941,563.89	224,116.15	23.80%	46,124.77	79,371.05	13.33%	37.13%	67.90	709.70	**350,389.57**
County Tier 3	2,238,545.93	496,147.77	22.16%	260,564.35	-	11.64%	33.80%	-	832.64	**757,544.76**
Superior Court Tier 1	272,749.23	68,251.00	25.02%	44,315.39	-	16.25%	41.27%	-	-	**112,566.39**
Superior Court Tier 3	57,956.55	11,058.59	23.79%	7,693.90	-	13.28%	37.07%	-	114.54	**18,867.03**
APCD Tier 1	70,429.39	15,492.86	22.00%	8,977.28	4,701.72	19.42%	41.42%	-	-	**29,171.86**
APCD Tier 3	10,580.80	2,292.20	21.66%	1,205.13	-	11.39%	33.05%	-	-	**3,497.33**
Pension Trust Staff Tier 1	7,168.55	1,647.33	22.98%	873.13	665.96	21.47%	44.45%	-	-	**3,186.42**
Pension Trust Staff Tier 2	7,936.80	1,823.87	22.98%	210.33	737.33	11.94%	34.92%	-	-	**2,771.53**
Pension Trust Staff Tier 3	8,789.32	1,976.73	22.49%	1,127.76	-	12.83%	35.32%	-	-	**3,104.49**
LAFCO Tier 1	12,494.29	3,378.46	27.04%	677.19	1,448.97	17.02%	44.06%	-	-	**5,504.62**
	7,594,120.19	1,751,860.57	23.07%	824,426.66	425,652.46	16.46%	39.53%	1,605.40	2,363.10	**$ 3,005,908.19**
TOTAL FOR THE MONTH	**15,154,706.97**	**3,504,630.19**	**23.13%**	**1,636,071.19**	**850,391.92**	**16.41%**	**39.53%**	**3,210.80**	**4,726.20**	**$ 5,999,030.30**
TOTAL YEAR TO DATE	**30,257,163.23**	**6,901,117.23**	**22.81%**	**3,183,420.12**	**1,704,584.64**	**16.15%**	**38.96%**	**7,172.97**	**25,713.00**	**$ 11,822,007.96**

REPORT OF SERVICE & DISABILITY RETIREMENTS & DROP PARTICIPANTS FOR THE MONTH OF:	FEBRUARY 2018

RETIREE NAME	DEPARTMENT	DATE	MONTHLY ALLOWANCE
FAHEY, DANA	PROBATION / RESERVE	02-01-2018	Awaiting calcs
FAHEY, SHIREEN	HEALTH / RESERVE	02-28-2018	Option selection
HANAN, THOMAS	SOCIAL SERVICES	02-24-2018	Awaiting calcs
OLIVIERI, DANIEL	MENTAL HEALTH / RECIPROCAL	02-10-2018	Awaiting calcs
PERRY, SUZANNE	LIBRARY	02-25-2018	Option selection
PRIOR, BRADLEY	PUBLIC HEALTH	02-14-2018	Option selection
WYSE, TERI	GENERAL HOSPITAL / RESERVE	02-11-2018	762.96 354.93** 1.51*
ADDENDUM:			
OLSON, DEBBIE	SHERIFF CORONER / ALTERNATE PAYEE	09-01-2017	Option selection
ACKER, STEPHANIE	DISTRICT ATTORNEY / RECIPROCAL	12-30-2017	Awaiting calcs
ALLEN, LEEANA	APCD / ALTERNATE PAYEE	12-30-2017	6408.92 64.98*
BOWEN, BRENDA	SUPERIOR COURT	12-30-2017	3983.75
McCALLISTER, D. DIANE	GENERAL HOSPITAL / RESERVE	12-01-2017	1493.39 280.59*
MIRANDA, PAUL	SHERIFF-CORONER / RECIPROCAL	12-02-2017	239.09 4.78*
TACKET, ARTHUR	MENTAL HEALTH / RECIPROCAL	12-30-2017	3746.83 285.50*
GINN, LAUNNIE	AGRICULTURE COMM / RECIPROCAL	01-01-2018	Option selection
HOWARD, STEPHEN	CHILD SUPPORT SERVICES / RECIPROCAL	01-26-2018	Awaiting calcs
BATSON, ELLA MARIE (DROP)	PROBATION / ALTERNATE PAYEE	01-01-2018	488.63 00.99*
MADRID, ARMIDA	PROBATION	01-30-2018	4226.60
MONROE, RICKY (DROP)	FACILITIES MAINTANENCE	01-01-2018	3489.30 12.47*

** Employee Additional Contribution Allowance (per Sections 5.07, 27.12, 28.12, 29.12, 30.12, and 31.12 of the Plan)*
*** Social Security Coordinated Temporary Annuity (per Section 13.06 of the Plan)*

Board of Trustees

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San Luis Obispo County Pension Trust
SLOCPT

Date: March 26, 2018

To: Board of Trustees

From: Carl Nelson – Executive Secretary

Agenda Item 5: Applications & Elections to Participate in the Defered Retirement Option Program (DROP)

Recomendation:

It is recommended that you receive and approve the Application & Election to Participate in DROP for the individuals listed below.

Discussion:

The San Luis Obispo County Pension Trust has received an Application & Election to Participate in DROP from the following members listed below:

No DROP Applications this month

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San Luis Obispo County Pension Trust
SLOCPT

Date: March 26, 2018

To: Board of Trustees

From: Carl Nelson – Executive Secretary
Amy Burke – Deputy Executive Secretary

Agenda Item 7: 2017 Actuarial Audit – Final Report

Recommendation:

It is recommended that the Board receive and file the final report from Bartel Associates on their actuarial audit of the 2017 Actuarial Valuation and the 2016 Actuarial Experience Study,

Discussion:

During 2017 the Board of Trustees retained Bartel Associates to perform an actuarial audit of SLOCPT's 2017 Actuarial Valuation and the 2016 Actuarial Experience Study. SLOCPT's actuary is Gabriel Roeder Smith (GRS) and it is the practice of SLOCPT to have an actuarial audit performed every five years by an independent actuarial firm.

Bartel Associates delivered a preliminary report to the Board of Trustees at its January 22, 2018 meeting. **Bartel's primary findings are that they have no material differences with GRS's actuarial work and find that the 2017 Actuarial Valuation has been reasonably calculated in accordance with the Plan provisions and can be relied upon.**

The final detailed report on the Actuarial Audit has been discussed with Bartel and GRS. The final draft of that report is attached to this memo. As is normal in such audits, there are be a number of audit findings that fall below the level of materiality to the overall Valuation results. Such findings involve technical details of how actuarial valuations are performed and serve to inform and improve the actuarial practices of the actuary being audited. The final audit report also comments on a variety of actuarial assumptions used in the valuation.

Following staff review and review by GRS, a number of minor suggested changes to actuarial methods as recommended in the Actuarial Audit are planned for inclusion in GRS' practices. Only one item in the audit was found to be inaccurate (treatment of Tier 2 pick-up contributions) due to a miscommunication from GRS to Bartel. That actuarial audit comment was subsequently removed from the final report. GRS reported positively on the thoroughness of the Bartel actuarial audit and the usefulness of some of the technical findings.

Attached to this memo is an exhibit from GRS commenting on the findings in the actuarial audit. GRS will be addressing these minor modifications as part of their work on the 2018 Actuarial Experience Study slated for presentation to the Board of Directors at the May 21, 2018 meeting.

Respectfully Submitted

San Luis Obispo County
Pension Trust
SLOCPT

BARTEL ASSOCIATES, LLC

Actuarial Review of January 1, 2017 Actuarial Valuation

And

January 1, 2011 through December 31, 2015 Experience Study

March 12, 2018

March 12, 2018

Carl Nelson, CFA
San Luis Obispo County Pension Trust
Executive Secretary & Chief Investment Officer
100 Mill Street
San Luis Obispo, CA 93408

Dear Mr. Nelson:

We are pleased to present the results of our review of the San Luis Obispo County Pension Trust (SLOCPT) January 1, 2017 actuarial valuation and January 1, 2011 through December 1, 2015 experience study. The purpose of our review was to verify the reasonableness of the actuarial calculations and recommendations made in those reports. Our report also comments on those calculations, methodologies and recommendations.

We would like to acknowledge the assistance of both SLOCPT and GRS staff. Both provided timely, helpful, and thorough responses to our questions and provided the supporting information we requested.

This review was conducted by the undersigned. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion in this report.

We would be pleased to discuss our review and this report with SLOCPT staff.

Sincerely,

Mary Elizabeth Redding,	Tak Frazita,
FSA, MAAA, EA, FCA	ASA, MAAA, EA
Vice President	Associate Actuary

c: Marilyn Oliver, Cathy Wandro, Bartel Associates, LLC

TABLE OF CONTENTS

SECTION 1
EXECUTIVE SUMMARY

This report has been prepared by Bartel Associates, LLC to present the results of our review of the January 1, 2017 actuarial valuation and the January 1, 2011 through December 31, 2015 experience study of the San Luis Obispo County Pension Trust (SLOCPT) by Gabriel Roeder Smith & Company (GRS). Our review was based on actuarial reports, census data, and additional information provided by SLOCPT and GRS.

Overall, we believe GRS's actuarial work produced for SLOCPT is reasonable, appropriate, and accurate, as well as following generally accepted actuarial principles and practices. We believe the experience study and the actuarial methods and assumptions selected based upon it are reasonable and overall comply with Actuarial Standards of Practice. Likewise, we find the overall census data work and calculation of actuarial liabilities reasonable, appropriate, and in compliance with actuarial standards of practice. Finally, we find the overall determination of the member and employer contribution rates to be reasonable. Our most significant findings are summarized as:

- On a percentage basis, the largest differences we found were in calculating the liabilities for Tier 2 deferred and reciprocal members. However, due to the small size of that group, the total dollar AAL difference was about $120,000.
- Across all groups, Bartel Associates' calculation of the Actuarial Accrued Liability as of January 1, 2017 is 1.7% lower than the GRS calculation. The 2017/18 employer contribution rate that would have resulted from our valuation is 3.7% below, or 0.92% of payroll lower than the rate GRS calculated.

We do have several comments and recommendations for GRS and SLOCPT based upon our review. Those comments are detailed in the following sections.

We would like to again express our thanks to SLOCPT and GRS staff for their assistance in this project.

* * * * * * *

Mary Elizabeth Redding

Tal Frazita

Mary Elizabeth Redding, FSA, MAAA, EA, FCA Vice President	Tak Frazita, ASA, MAAA, EA Associate Actuary
Catherine A. Wandro Catherine A. Wandro, ASA, MAAA, FCA Assistant Vice President	Marilyn M. Oliver Marilyn M. Oliver, FSA, MAAA, EA, FCA Vice President

PART 1: REVIEW OF ACTUARIAL VALUATION PURPOSE, SCOPE AND METHODOLOGY

Purpose of the Actuarial Review

Bartel Associates, LLC has performed an actuarial review of SLOCPT's January 1, 2017 actuarial valuation to provide assurance to SLOCPT that the actuarial calculations, methods, assumptions, and conclusions are reasonable and conform to Actuarial Standards of Practice.

Scope of the Actuarial Review

The scope our review includes the following:

1) Conduct an independent review and analysis of the valuation results, including an evaluation of the data used for reasonableness and consistency as well as a review of mathematical calculations for completeness and accuracy.
2) Verification that all appropriate benefits have been valued and valued accurately.
3) Verification that the data provided by the system is consistent with data used by GRS.
4) Evaluation of the actuarial cost method and actuarial asset valuation method in use and whether other methods would be more appropriate for SLOCPT.
5) Verification of the reasonableness of the calculation of the unfunded actuarial accrued liability

Methodology

Our actuarial review process consisted of the following steps:

1) Compare the demographics of the data provided by SLOCPT with the valuation data used by GRS for the January 1, 2017 actuarial valuation. Review GRS's data editing procedures. Process the data in accordance with Bartel Associates' procedures, taking into account additional information provided by GRS, and compare the results to GRS's valuation data.
2) Independently summarize SLOCPT's benefit provisions. Using that, develop an actuarial valuation model. Use the actuarial assumptions in GRS's report, comparing those to the assumptions recommended in the experience study. Compare the benefit provisions in GRS's report to our independent summary.
3) Select "sample lives" who are individuals from each benefit tier and member status with a range of pay, service, and gender. Use the valuation model to determine actuarial liabilities for each. Obtain a summary of GRS's results for these same individuals. Discuss any discrepancies. Adjust the valuation model as required and appropriate.
4) Run the valuation model with GRS's valuation data, compile results by categories and compare to GRS's results.

5) Review the assets included in the valuation. Review GRS's calculation of the actuarial valuation of assets. Determine whether the methodology is appropriate.
6) Review and replicate the calculation of the unfunded actuarial accrued liability and its amortization. Determine whether the methodology is appropriate.
7) Review and replicate the calculation of employer contribution rates. Determine whether the methodology is appropriate.
8) Review the complete actuarial valuation report for compliance with actuarial standards, clarity, and completeness. Present recommendations for improvement.

The remainder of Part 1 of our report presents the results of each of these steps.

Part 1: Review of Actuarial Valuation Results: Census Data

The exhibit below provides a comparison by status of key data indicators in GRS's valuation data and the SLOCPT raw data as processed by Bartel Associates. In general, the data files match very closely, with differences attributable mainly to differences in classification (Miscellaneous/Probation/Safety) of a few beneficiaries and vested members.

Overall, we believe the census data is reasonable and, as used in the valuation, complies with Actuarial Standards of Practice regarding data quality. In our opinion data is adequate to support the valuation's conclusions.

Observations and Recommendations

1) The census data file we received from SLOCPT had 58 Tier 2 and Tier 3 employees under 80 hours per pay period. The valuation file we received from GRS had only 1 Tier 2 person under 80 hours. The difference in total payroll is about $2 million. There is minimal impact on the contribution rate.
2) Survivor benefits of retirees electing the Social Security level option are unaffected by that election. The survivor benefit amount is included in the census data for retirees electing Option 8 (50% Joint and Survivor Option 3 with Social Security level benefit). However, the survivor benefit is not included in the census data if Option 7 (l00% Joint and Survivor Option 2 with Social Security level benefit) was elected. The survivor benefit cannot be determined from the data, so GRS has estimated it as 100% of the retiree's benefit. This impacts 35 people, or about 2% of retirees. This is a reasonable estimate. We recommend that in the future, the survivor benefit be included in the census data for retirees electing Option 7.
3) The census data field for the contribution balance of retirees election Option 1 is being interpreted differently by SLOCPT and GRS. GRS stated the contribution balance is as of the member's original retirement date. SLOCPT told us the amount is the remaining balance as of the valuation date. 195 retirees have either option 1 or option 6. If the contribution balance is as of the valuation date but it is being treated in the valuation as being as of the original retirement date, the resulting accrued liability would be slightly understated. We recommend GRS and SLOCPT clarify this field.
4) A data error occurred for one of the selected sample lives. The post-62 benefit was missing from the original census data sent by SLOCPT to GRS. GRS requested this amount, and SLOCPT supplied it. That amount was included in the valuation data passed to Bartel Associates, but had not been in the actual data used for the valuation.

Comparison of Census Data

	GRS Valuation Data	SLOCPT Data Processed by Bartel Associates	Ratio Bartel/GRS
Active			
Number	2,675	2,675	100%
Avg. Age	45.5	45.5	100%
Avg. Service	9.7	9.7	100%
Avg. Pay	$ 69,166	$ 68,477	99%
Deferred			
Number	247	245	99%
Avg. Age	50.3	50.3	100%
Avg. Service	8.9	9.0	100%
Avg. Term Age	40.2	40.1	100%
Contrib Balance	$ 92,285	$ 92,610	100%
Reciprocal			
Number	213	213	100%
Avg. Age	49.0	49.0	100%
Avg. Service	4.6	4.6	100%
Avg. Term Age	39.1	39.2	100%
Contrib Balance	$ 58,329	$ 58,329	100%
Retired			
Number	2,414	2,414	100%
Avg. Age	68.4	68.4	100%
Avg. RA	58.3	58.3	100%
Beneficiaries			
Number	204	204	100%
Avg. Age	75.4	75.4	100%

More detailed comparisons of the census data are provided in Appendix A.

PART 1: REVIEW OF ACTUARIAL VALUATION RESULTS: ACTUARIAL LIABILITIES

Shown below is a comparison of key valuation actuarial liabilities calculated by Bartel Associates compared to those in GRS's valuation report (amounts in $000s). Appendix C provides a more detailed listing of results by Tier and Status. Appendix B provides a comparison of Bartel Associates' and GRS's test life results.

	Bartel Associates				GRS Valuation			
	Misc	Probation	Safety	Total	Misc	Probation	Safety	Total
Present Value of Future Benefits (PVFB)								
Actives	706,756	47,391	157,816	911,963	708,181	44,438	158,109	910,728
Retirees and Beneficiaries	842,994	42,357	222,766	1,108,116	864,764	43,152	227,027	1,134,943
Deferred and Reciprocal	56,931	1,866	5,481	64,279	57,177	1,885	5,441	64,503
Total	1,606,680	91,615	386,063	2,084,358	1,630,122	89,475	390,577	2,110,173
Actuarial Accured Liability (AAL)								
Actives	492,910	28,807	102,313	624,031	495,508	28,585	103,804	627,897
Retirees and Beneficiaries	842,994	42,357	222,766	1,108,116	864,764	43,152	227,027	1,134,943
Deferred and Reciprocal	56,931	1,866	5,481	64,279	57,177	1,885	5,441	64,503
Total	1,392,835	73,030	330,560	1,796,425	1,417,449	73,622	336,271	1,827,342
Total Normal Cost (TNC)								
Actives	19.5%	22.9%	25.8%	20.5%	20.1%	22.7%	26.3%	21.1%

	Ratio Bartel / GRS			
	Misc	Probation	Safety	Total
Present Value of Future Benefits (PVFB)				
Actives	99.8%	106.6%	99.8%	100.1%
Retirees and Beneficiaries	97.5%	98.2%	98.1%	97.6%
Deferred and Reciprocal	99.6%	99.0%	100.7%	99.7%
Total	98.6%	102.4%	98.8%	98.8%
Actuarial Accured Liability (AAL)				
Actives	99.5%	100.8%	98.6%	99.4%
Retirees and Beneficiaries	97.5%	98.2%	98.1%	97.6%
Deferred and Reciprocal	99.6%	99.0%	100.7%	99.7%
Total	98.3%	99.2%	98.3%	98.3%
Total Normal Cost (TNC)				
Actives	96.8%	101.0%	98.3%	97.3%

PART 1: REVIEW OF ACTUARIAL VALUATION RESULTS: ACTUARIAL LIABILITIES

Present Value of Future Benefits (PVFB) is the value today of all projected benefits for each member, taking into account the time value of money (discounting for interest until the time the benefits are projected to be paid) as well as the projected level of benefits, probability of remaining employed, and the expected lifetime of the member and beneficiary. The average ratio is 98.8%. This indicates that overall, there is a good match with GRS for both the benefits being projected for active employees and the actuarial assumptions.

Actuarial Accrued Liability (AAL) is the portion of the present value of future benefits deemed earned to date under the selected actuarial cost method, and the total Normal Cost is the portion of the PVFB allocated to the coming year. Under the Entry Age method used in SLOCPT's valuation, this allocation is in proportion to the present value of future pay beginning from each member's entry age. For inactive members, PVFB is the same as the AAL. The average AAL ratio is 99.4 % for active members and the average total normal cost ratio is 97.3%. This indicates that overall, there is a reasonable match with GRS for present value of future pay, entry age, and valuation methodology.

Observations and Recommendations

While our overall match was good, we identified one specific area where we believe benefits are not being correctly valued. For retirees electing Option 3, GRS's calculation of the spouse continuance benefit differs slightly from SLOCPT's actual method of calculating the spouse continuance; specifically due to the survivor COLA allocation. This leads to a very small overstatement of the potential survivor benefit for the 260 retirees with option 3.

Conclusion

We believe our total results are within an acceptable range of GRS's indicating that the significant liabilities are reasonably valued.

PART 1: REVIEW OF ACTUARIAL VALUATION RESULTS: VALUE OF ASSETS

Actuarial Value of Assets

Bartel Associates verified the market value of assets (MVA) and change in market value for the year against the fiduciary net position reported in SLOCPT's 2016 CAFR. We were not able to verify the approximately $4 million excludable assets, but note they are approximately 0.3% of the asset value. We have replicated GRS's calculation of the actuarial value of assets.

The actuarial value of assets (AVA) methodology used in the valuation recognizes investment returns above and below the assumed rate of return over five year periods. This method is intended to smooth short term asset volatility in order to lower the volatility in employer contribution rates. The actuarial value of assets is not limited to a corridor around the market value of assets.

An exception to the five year smoothing period was made for the asset loss resulting from the 2008 market downturn. The 2008 asset loss was originally recognized over a 10 year period, although an additional $10 million of the deferred loss was recognized in each of the January 1, 2011 and January 1, 2014 valuations. There are 2 years remaining as of January 1, 2017.

Observations and Recommendations

Asset Revenues and Disbursements

In the actuarial valuation report, the discount for pre-payment of certain employer contributions is not shown separately but only combined with administrative expenses. We believe this amount should be shown separately. It is a discount applied to the required employer contributions in exchange for earlier payment. Thus, the fund is expected to have higher investment revenues for the period, and these extra earnings should offset the discount applied. We believe the most appropriate place to show this discount is next to the employer contributions it was applied to.

Asset Smoothing Method

The asset smoothing method is based on delayed recognition of investment returns different than the expected rate of return applied to the previous year's actuarial value of assets. As applied, the methodology does not result in the actuarial value of assets equaling market value after a period of 5 years of returns exactly at the assumed rate. The method's actuarial value of assets would be close to market value in that situation (within 3%, depending on previous results), and would approach market value over time. While we do not believe this result is desirable, it does not preclude the method from being reasonable.

We find the actuarial asset value methodology to be reasonable. The 5-year asset smoothing period is the most common method used by public plans.

The methodology, in our opinion, meets Actuarial Standard of Practice No. 44 since:

1) Differences between the AVA and MVA are recognized over a reasonable period of time. The 10-year recognition of the 2008 asset loss was an exception to the 5-year smoothing policy, and caused a temporary lengthening of the overall smoothing period. However, there are only 2 years remaining in the recognition of the 2008 asset loss so the impact is almost fully realized.
2) While the AVA is not limited to a corridor around the MVA, we believe the 5-year smoothing policy is "sufficiently short" to make the absence of a corridor acceptable.
3) The method is not biased – it is not expected to produce AVA values over or under the MVA.
4) Realized and unrealized gains and losses are treated identically.

The methodology used also meets the "Acceptable Practice" definition in the California Actuarial Advisory Panel's (CAAP's) publication "Actuarial Funding Policies and Practices for Public Pension and OPEB Plans and Level Cost Allocation Model". One of the "acceptable practices" is a 5-year (or shorter) smoothing period with no corridor.

During the 10-year recognition period of the 2008 asset loss, the overall recognition period was longer than 5-years. The CAAP considers a smoothing period longer than 5 years with no market value corridor to be a "non-recommended practice". We recommend that the Board consider in advance the actions it might take with regard to asset smoothing if another severe market downturn occurs.

Asset Allocation

As part of the actuarial valuation, the actuary allocates valuation assets between the Miscellaneous, Probation, and Safety groups. The allocation is made by first allocating total member contributions, total employer contributions, and total benefit payments to each group based on expected amounts. The prior year's valuation assets are updated with these allocated amounts, and the difference between this updated amount and the current year's valuation assets are allocated so each group's liabilities end up with the same funded percent.

This method is much simpler and more transparent than attempting to create bookkeeping accounts for each group and tracking the assets and expenses attributable to each. However, if in the future a change should be made that impacts the liability of only one group or employer, this method would result in the cost of that change being spread among all groups. We recommend that the Board consider any change to the asset allocation method that might be made in advance of such a change occurring.

Amortization Method for Unfunded Actuarial Accrued Liability (UAAL)

SLOCPT's adopted policy is to amortize the UAAL as a level percentage of payroll over a fixed period of 23 years from January 1, 2017.

The CAAP's publication "Actuarial Funding Policies and Practices for Public Pension and OPEB Plans and Level Cost Allocation Model" provides a detailed discussion of amortization policies and expresses a preference for:

1) Level percentage of pay amortization
    a. Meets the general policy goal of being a reasonable allocation of the cost of benefits to years of service
    b. Mirrors the percentage of pay cost allocation inherent in the Entry Age cost method.
2) Multiple fixed amortization layers
    a. Track UAAL components by source, increasing transparency
    b. Avoids the "reset" needed by a single fixed period amortization policy (such as SLOCPT's) when the single amortization period becomes too short to provide contribution stability.
3) Amortization periods of 15-20 years for actuarial gains and losses, to avoid negative amortization.

Observations and Recommendations

Under SLOCPT's current actuarial assumptions (7.125% discount rate and 3.375% payroll growth) an amortization period of 23 years produces "negative amortization" meaning that the amortization payment is less than interest in the UAAL. Thus the UAAL will actually increase during the year, even if all actuarial assumptions are met and the required contributions are paid. Negative amortization will continue for four years, until the amortization period declines to 19 years. At that point the amortization payment will be slightly larger than interest on the UAAL. In subsequent years more and more of the UAAL principal will be paid each year and the balance is expected to decline, if all assumptions are met.

As the amortization period declines, any unexpected decreases or increases on the UAAL will have increasingly larger impacts on the contribution rate. Two options to alleviate this are:

1) Freeze the amortization period at a point where sufficient smoothing is provided, or
2) Create new UAAL layers for changes to the UAAL and amortize them each over a fixed period.

We recommend that the Board discuss these options over the next few years so that a policy can be established in advance.

Payroll Growth Assumption

The assumed rate of overall payroll growth is 3.375%. This means that amortization payments are structured to increase 3.375% each year. If total payroll grows less than 3.375%, the amortization payment will increase each year as a percentage of payroll.

Typically, the overall payroll growth assumption follows the assumed rate of inflation plus productivity growth, or 2.625% + .25% = 2.875%. Additionally, 3.375% is higher than average rates in the recent past: the 3-year average is 4.0%, but the 5-year average is 2.8% and the 10-year average is 2.0%.

Determination of Contribution Rates

Overall, we have verified that GRS's calculations of the total UAAL and the total employer and member Normal Cost contribution rates as a percentage of payroll are reasonable and calculated accurately, reflecting the results of the actuarial valuation.

Comments and Recommendations

We note that the expected investment return rate (discount rate) is net of administrative expenses. GASB Statements 67 and 68 require separate reporting of administrative costs, as current period expenses. SLOCPT might consider this approach for funding purposes as well, to increase transparency and permit use of the same discount rate for both purposes.

We assume that the employer contribution rates determined in the actuarial valuation are intended to apply only to pensionable earnings, in particular, to the earnings of Tier 3 employees only up to the PEPRA limits. We recommend this be specifically stated in the report.

PART 1: REVIEW OF ACTUARIAL VALUATION RESULTS: EMPLOYER CONTRIBUTION RATES

The required contribution rates for the year are calculated separately for each tier and then applied to total beginning-of-the-year payroll to determine the required overall contribution rates. During the year, Tier 1 employees are expected to leave the group and be replaced with Tier 3 employees. Tier 3 employer contribution rates are slightly higher (about .65% of pay) than Tier 1, so we would expect a small actuarial gain to be generated. The relationship of employer contribution rates between the Tiers should be monitored. A more detailed projection of expected payroll by Tier would produce a more accurate contribution rate for the year.

The following chart compares the employer contribution rates we calculated for each group, including reallocation of UAL, as compared to GRS's results.

Bartel Associates				
	Miscellaneous	**Probation**	**Safety**	**Total**
Total Normal Cost	19.49%	22.94%	25.83%	20.51%
Member Contribution Rate	15.01%	18.58%	19.44%	15.77%
Employer Normal Cost Rate	4.49%	4.36%	6.39%	4.74%
UAL Amortization	17.87%	17.09%	25.71%	18.90%
Net Employer Contribution Rate	22.36%	21.45%	32.10%	23.64%

GRS Valuation Report				
	Miscellaneous	**Probation**	**Safety**	**Total**
Total Normal Cost	20.14%	22.72%	26.27%	21.08%
Member Contribution Rate	15.01%	18.55%	19.42%	15.76%
Employer Normal Cost Rate	5.13%	4.17%	6.85%	5.32%
UAL Amortization	18.19%	17.32%	26.30%	19.24%
Net Employer Contribution Rate	23.32%	21.49%	33.15%	24.56%

Ratio Bartel/GRS				
	Miscellaneous	**Probation**	**Safety**	**Total**
Total Normal Cost	96.8%	101.0%	98.3%	97.3%
Member Contribution Rate	100.0%	100.2%	100.1%	100.1%
Employer Normal Cost Rate	87.5%	104.6%	93.3%	89.1%
UAL Amortization	98.2%	98.7%	97.8%	98.2%
Net Employer Contribution Rate	95.9%	99.8%	96.8%	96.3%

Conclusion

In our opinion, the resulting employer contribution rates are sufficiently close for us to conclude that the employer contribution rates developed in the actuarial valuation report are reasonable.

Part 1: Review of Actuarial Valuation Results: Review of Actuarial Valuation Report

We reviewed the actuarial valuation report for compliance with the Actuarial Standards of Practice, as well for other information that might be missing or unclear to the reader. The following are our comments.

1) The actuarial valuation report has a typographical error in the assumptions section. It states that termination rates are applied after retirement eligibility but GRS told us they are not. This has a significant effect on liabilities of newer employees.
2) For Tier 3, the valuation report should be clear in all instances whether compensation for Tier 3 refers to PEPRA-limited compensation.
3) Also for Tier 3, it is not clear whether the member contribution rates are calculated as ½ of the normal cost rates. If so, this should be described in the report.
4) We understand GRS has taken COLA banks into account in projecting future retiree COLAs. This should be described in the plan summary and assumptions.

PART 2: REVIEW OF ACTUARIAL EXPERIENCE STUDY
PURPOSE, SCOPE & METHODOLOGY

Purpose of the Actuarial Review

Bartel Associates has performed an actuarial review of SLOCPT's January 1, 2011 through December 31, 2015 experience study to provide assurance to the Trustees that the actuarial calculations, methods, considerations and analysis are reasonable and conform to Actuarial Standards of Practice.

Scope of the Actuarial Review

The scope our review includes the following:

1) Evaluation of the available data for the performance of such experience study, the degree to which such data is sufficient to support the conclusions of the study, and the use and appropriateness of any assumptions made regarding such data.
2) Evaluation of recommended economic and non-economic assumptions as presented in the experience study report.
3) Independent reproduction of the experience study without relying on GRS's work.
4) Evaluation of the study results and reconciliation of any discrepancies between the findings, assumptions, methodology, rates, and adjustments.

Methodology

Bartel Associates performed the following steps in connection with our review of the actuarial experience study.

1) We performed stochastic modeling to evaluate GRS's determination of the expected rate of return on assets and also to evaluate the discount rate we would recommend based on Bartel Associates' usual capital market assumptions.
2) Based on the historical data files provided by GRS, we replicated the demographic experience study and compared our replication to GRS's results.
3) For other assumptions, we reviewed GRS's report and used professional judgment to evaluate the methodologies, evaluation of data, and conclusions drawn.

PART 2: REVIEW OF ACTUARIAL EXPERIENCE STUDY RESULTS: ECONOMIC ASSUMPTIONS

The economic assumptions included in GRS's actuarial experience study were:

1) Price inflation
2) COLA Growth
3) Across-the Board Pay Increases
4) Discount rate

Price Inflation:

In addition to providing a basis for valuing SLOCPT's COLA increases, this assumption is a building block used in the construction of the following assumptions: discount rate, across-the board pay increase (wage inflation), and increase to the maximum earnings limit for Tier 3 members.

SLOCPT's inflation rate recommended by the experience study is 2.625%. We agree that this is a reasonable long-term assumption.

Retiree COLA Growth

COLA increases are based on inflation, but are capped at 3% for Tier 1 and 2% for Tiers 2 and 3. In years where inflation is greater than the COLA caps, the excess is "banked" for Tier 1 members, but not for Tier 2 or 3 members. GRS recommended a 2.625% COLA increase assumption for Tier 1, and a 2% COLA increase assumption for Tiers 2 and 3. We consider these assumptions reasonable.

Across-the Board Pay Increases (Wage Inflation)

This assumption is generally based on the assumed inflation rate plus a component for pay increases in excess of inflation (i.e. increases in real wages). The assumption is used as a building block in determining future active member pay increases. The assumption recommended in the GRS report was 0.25%. We believe this assumption is reasonable.

Discount Rate

This assumption is dependent on the assumed rate of inflation and the "real" rate of return on the various asset investment classes in the SLOCPT fund, net of investment and administrative expenses. The assumption recommended by GRS is 7.125%. This may be looked at as a 2.625% inflation rate and a real rate of return for the portfolio of 4.7% reduced by an administrative expense adjustment of 0.2%.

PART 2: REVIEW OF ACTUARIAL EXPERIENCE STUDY RESULTS: ECONOMIC ASSUMPTIONS

GRS considered returns for the SLOCPT portfolio based on VERUS 10-year capital market assumptions and also based on a survey of investment consultant's capital market assumptions. GRS expected returns are compared to a breakdown of their recommended return below:

	VERUS	Investment Consultant Average	Recommended
Inflation Assumption	2.625%	2.625%	2.625%
Real Rate of Return	3.89%	4.49%	4.70%
Administrative expenses	(0.20%)	(0.20%)	(0.20%)
Expected Nominal Return	6.32%	6.92%	7.125%

We used our own capital market real rate of return assumptions at the time of the experience study, which are based on those of an average of four outside investment advisors, and SLOCPT's 2.625% inflation assumption to generate median results (50% confidence that assumption will be met) and also 45% and 55% confidence results as illustrated below:

	45% Confidence	50% Confidence	55% Confidence
Real Rate of Return	4.73%	4.44%	4.20%
GRS Inflation	2.63%	2.63%	2.63%
Nominal Return	7.35%	7.07%	6.82%
Administrative Expenses	(0.20%)	(0.20%)	(0.20%)
Discount Rate	7.15%	6.87%	6.62%

The results confirm that the 7.125% is a reasonable assumption as of the experience study date. We believe most investment consultants have lowered their expected return assumptions since then, and a current analysis would likely recommend a lower discount rate.

PART 2: REVIEW OF ACTUARIAL EXPERIENCE STUDY RESULTS: DEMOGRAPHIC ASSUMPTIONS

Actuarial Standard of Practice #35, "Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations" defines a reasonable assumption as one that:

1) Is appropriate for the purpose of the measurement;
2) Reflects the actuary's professional judgment;
3) Takes into account historical and current demographic data that is relevant as of the measurement date;
4) Reflects the actuary's estimate of future experience; and
5) Has no significant bias (i.e., it is not significantly optimistic or pessimistic).

The Standard also notes that, due to the inherent uncertainties in trying to predict the future, there is a range of possible reasonable assumptions and different actuaries may select different reasonable assumptions.

Our analysis focused on whether we believe the selected assumptions are reasonable and adequately supported by the data. However, we have several recommendations for improvements in subsequent studies.

The demographic assumptions reviewed by GRS with recommended assumptions supported by detailed analysis of the past 5 years data are: active employee and retiree mortality, termination, and disability and service retirement and merit salary increases. For these, Bartel Associates replicated the experience study performed by GRS. In general, our results are very close to GRS's.

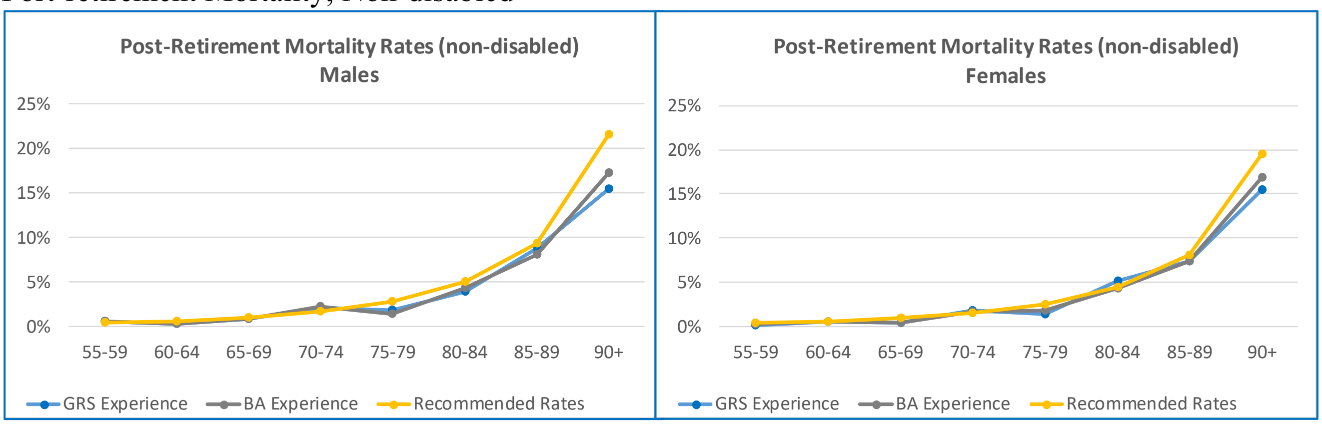
Conclusion

Overall, we believe GRS's calculations are accurate and produced conclusions and recommended actuarial assumptions that are appropriate, supported by the data, and reasonable.

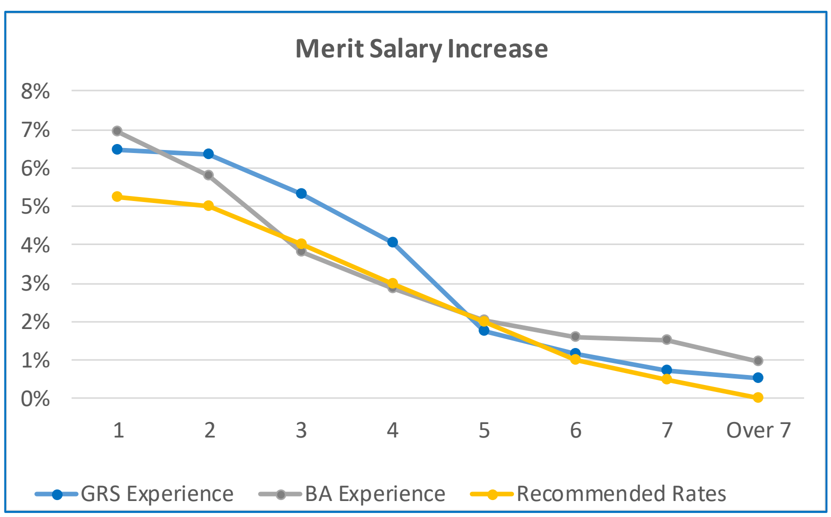
Comments

Following are selected charts showing a comparison of the raw rates produced by our studies.

Port-retirement Mortality, Non-disabled



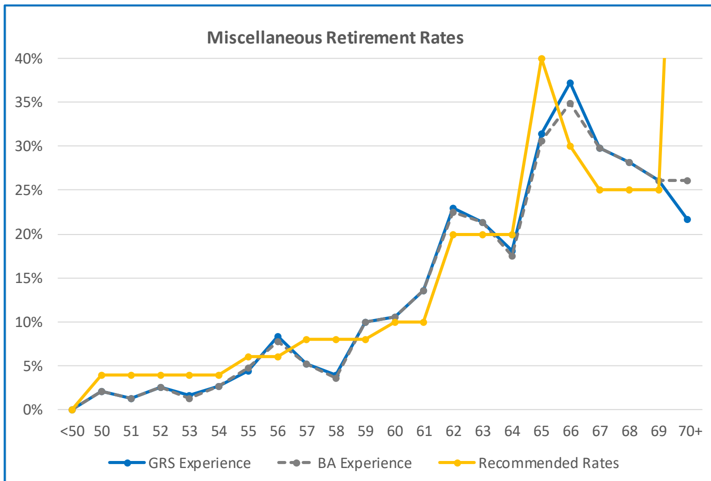
Salary – Merit and longevity: comparison of raw annual increases for each year of service.

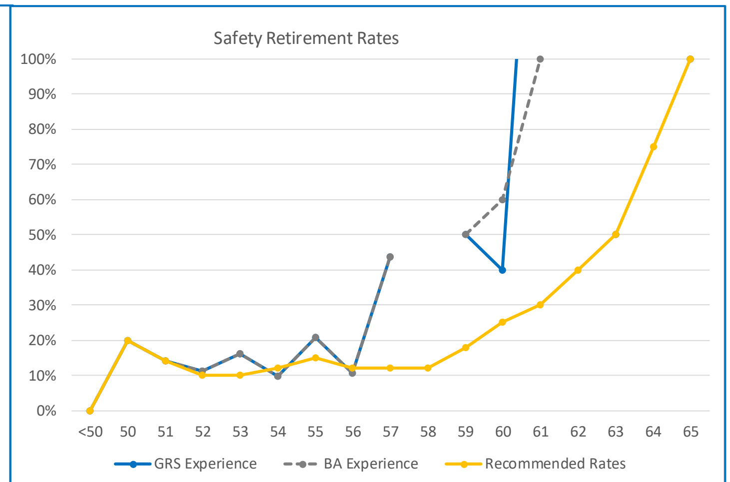


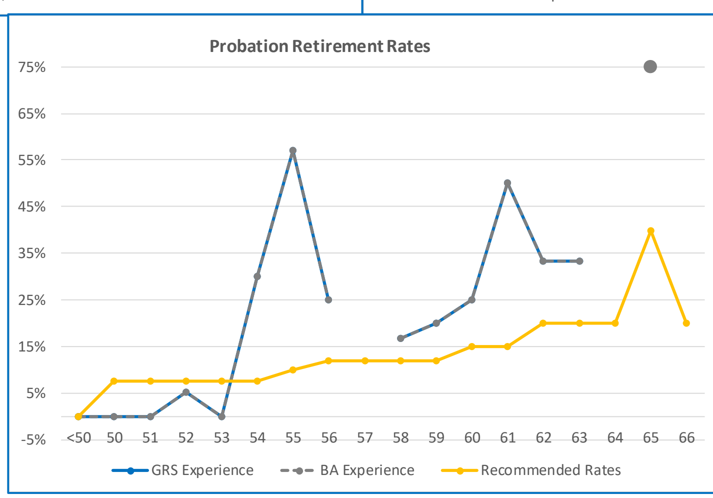
Termination of employment – comparison of raw annual increases for each age group.

Service Retirement (Tier 1). We note the discrepancies apparent at later ages in the tables are due to the limited number of exposures at those ages, so that a difference in categorization of one member can have a visible impact on the rates.

For Safety and Probation, there are very few exposed lives remaining by age 57.







Data Analysis and Recommendations

GRS has followed standard industry methodology by finding "A/E" ratios for each contingency. The number of occurrences actually ("A") found in the data is divided by the number expected ("E") or predicted by the assumptions. Ratios near 100% indicate the assumptions may be working well. However, this overall calculation considers only the total number of occurrences and not how they are distributed by age or service. That timing is very important to the liabilities produced by the valuation.

PART 2: REVIEW OF ACTUARIAL EXPERIENCE STUDY RESULTS: DEMOGRAPHIC ASSUMPTIONS

Recommendations

The following are recommendations that we believe would improve the demographic experience study:

1) A graphical presentation of the actual and expected experience would enhance the report's understandability.
2) We recommend presenting the existing and proposed rates along with the actual study data, preferably as a graph.
3) Presentation of the number of exposures in each age or service group allows the reader to understand for which groups there is sufficient data to be reliable, and similarly, for which groupings the assumption is most important.
4) We recommend use of the r-squared statistical measure to illustrate how close the current and proposed rates are to the observed data. This is a better measure than the total Active/Expected ratio, since it takes into account the fit of each data point.
5) It would be helpful if the report presented both the current and recommended tables of assumptions.

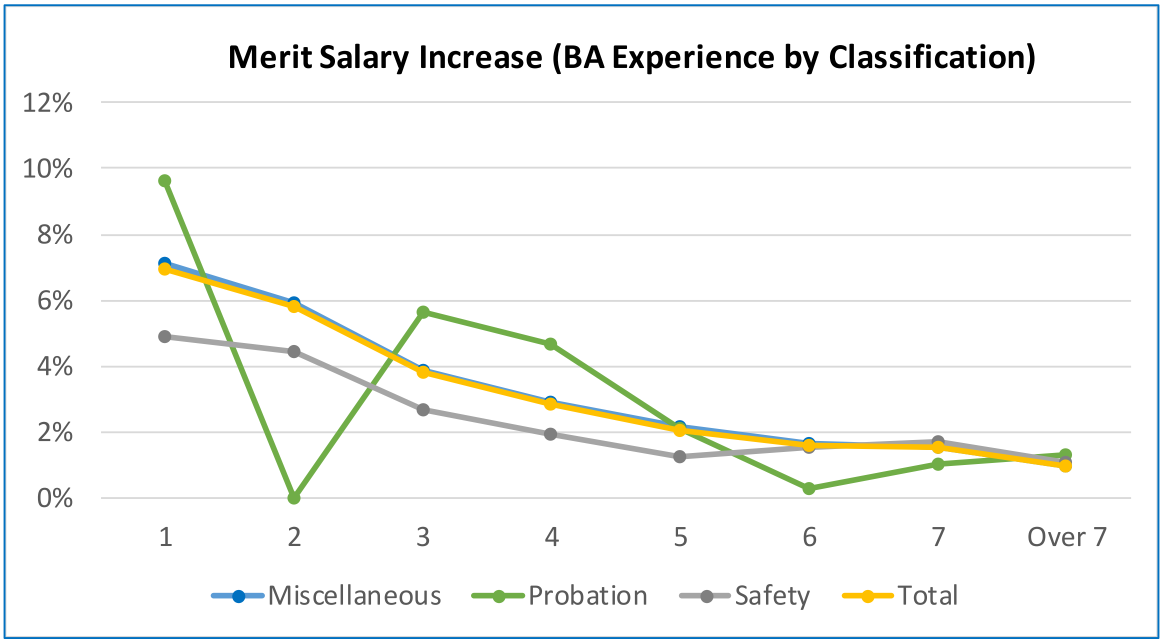
Following are our comments on some of the specific calculations and assumptions selected.

Merit Pay Increases

The merit salary increase rates calculated by Bartel Associates following GRS's methodology are very close to those calculated by GRS.

Comments and Recommendations.

1) GRS calculates merit pay by subtracting actual CPI and assumed across-the-board (or productivity) pay increase from the total observed pay increases. However, due to the bargaining cycle, actual CPI during the experience study period may not be reflected in pay increases received. An alternative method would calculate merit increases as pay increases in excess of the increase in aggregate average wages for longer-service members.
2) The methodology for determining merit increases should be documented in the report.
3) GRS has recommended the same merit increases for each membership group. In the data, we noticed different pay increase patterns for each group. We recommend this be further analyzed in the next study and consideration be given to using a separate merit pay scale for each classification.



Disability

We note that the actual number of disablements experienced during the 5-year period encompassed by the experience study is quite small: 2 disablements for Safety members, 6 for Miscellaneous, and 1 for probation members. This is less than the expected number of disablements. GRS has recommended retaining the current tables.

Recommendations

1) The source of the current disablement rates is not discussed in the report. We recommend that be disclosed.
2) In the next experience study, we recommend incorporating more years of disablement experience, both to provide more data points and to monitor experience for any trends. In addition, it might be helpful to use outside sources of disablement data, such as studies performed by CalPERS and large County systems.

Post-retirement Mortality

GRS has recommended a standard Society of Actuaries mortality table for SLOCPT's use. They comment that this table is based on national data from private-sector pension plans. CalPERS studies have shown that California public sector mortality experience is different from, and better than (i.e., longer expected lifetimes) than national data. GRS also adjusted the Society of Actuaries then–new mortality improvement scale (2015) to reflect less expected future mortality improvement.

Comments and Recommendations.

1) In analyzing the Actual/Expected ratios, experience data should be weighted by benefit amount.
2) The number of exposures and deaths in the study is not large enough to be fully credible. The actual/expected ratio should be adjusted for credibility.
3) Alternatively, mortality rates developed based on a fully credible group with similar demographics could be used. We would suggest using CalPERS mortality data for this purpose. CalPERS' population is similar to SLOCPT's in location, pension income, access to health care, and public sector employment. It is possible that many SLOCPT retirees are also CalPERS annuitants.
4) In the past 2 years, the Society of Actuaries has scaled back their projections of mortality improvement below the initial 2015 improvement scale. However, application of the 2017 mortality improvement scale instead of the current adjusted 2015 improvement scale would still produce actuarial liabilities approximately 1/2% higher than the current assumptions. While the data is not credible, we do note that the 2017 valuation did have a mortality loss using the recommended mortality assumptions.

Pre-retirement Mortality and Disabled Retiree Mortality

We replicated the experience study results for both mortality categories. We agree with GRS that there is not enough data to be credible and concur with the use of a standard mortality table.

Service Retirement

GRS's experience study recommends service retirement rates that differ for Miscellaneous, Probation, and Safety classifications, and are also different for Tier 1 and Tier 2/3 employees.

We have replicated the actual retirement rates very closely for Tier 1 employees. For Tier 2/3 no source of the retirement rates is presented. We note that the Tier 2/3 rates for Miscellaneous employees produce an average retirement age, for the average SLOCPT

Miscellaneous employee, that is similar to the average age produced by CalPERS' assumptions for Miscellaneous PEPRA members.

Comments and Recommendations

1) The retirement rates used for Safety members do not distinguish between those members with the 3%@55 formula and the 3%@50 formula. We would typically expect there to be different retirement patterns for those with different formulas. We concur with GRS' plan to monitor this in the next experience study. If insufficient data exists from this plan, data from other plans with similar benefit formulas could be used to build an assumption.
2) We also note that the actual experience indicated higher levels of retirement at ages 57 to 62 for the Probation and Safety groups than expected under the retirement rates. The retirement rate tables for Safety members project an average retirement age of 55.7 while most employees have already retired before age 55: the median age of exposed lives in the study is about 53 and the average retirement age of current Safety members is 52.6, although this includes disabled retirees. This suggests that Safety employees may be retiring earlier than expected by the recommended rates. We recommend examining this in the next experience study.

Other Assumptions not Included in the Experience Study

We have reviewed the other actuarial assumptions and have the following comments on certain of the assumptions.

Reciprocity

The valuation assumes 40% of vested terminations are reciprocal. Current census data shows 54% of vested terminations as reciprocal. We recommend including this assumption in the next experience study.

Assumed Retirement Age for Inactives

The valuation report states that current deferred vested members are assumed to retire at age 60 and that current Reserve members are assumed to retire at age 55. Future Reserve and Reciprocal members (i.e., those still active who will terminate their employment in the future) are assumed to retire at age 57. No basis is provided for these assumptions. We recommend an analysis or documentation as part of the next experience study.

Supplemental Contributions

The valuation report states that, based on information provided by the Trust, 10% of contribution balances are assumed to be for supplemental/additional benefits. Based on the active employee data provided to us, it appears that approximately 1% of contribution balances are for supplemental/additional balances.

Service

We note that the "vesting service" field provided by SLOCPT in the census data was used for all purposes, including calculating vesting and other eligibility as well as benefits. Employees with reciprocity might have different eligibility and benefit service. We would recommend analysis of this factor in the next experience study.

APPENDIX A
MEMBERSHIP DETAIL

Summary of Valuation Data as of January 1, 2017

	GRS Valuation Data				SLOCPT Data Processed by Bartel Associates				Ratio Bartel/GRS			
	Misc	Prob.	Safety	Total	Misc	Prob.	Safety	Total	Misc	Prob.	Safety	Total
Active												
Number	2,281	116	278	2,675	2,281	116	278	2,675	100%	100%	100%	100%
Avg. Age	46.4	39.6	41.1	45.5	46.4	39.6	41.1	45.5	100%	100%	100%	100%
Avg. Service	9.6	9.3	11.2	9.7	9.6	9.3	11.2	9.7	100%	100%	100%	100%
Avg. Pay	$ 66,560	$ 71,404	$ 89,617	$ 69,166	$ 65,752	$ 71,404	$ 89,617	$ 68,477	99%	100%	100%	99%
Deferred												
Number	212	9	26	247	211	9	25	245	100%	100%	96%	99%
Avg. Age	51.3	42.8	44.8	50.3	51.3	42.8	44.5	50.3	100%	100%	99%	100%
Avg. Service	9.1	8.5	7.6	8.9	9.1	8.5	7.9	9.0	100%	100%	103%	100%
Avg. Term Age	40.7	36.2	36.9	40.2	40.7	36.2	36.7	40.1	100%	100%	99%	100%
Contrib Balance	$ 90,210	$ 94,702	$ 108,366	$ 92,285	$ 90,141	$ 94,702	$ 112,700	$ 92,610	100%	100%	104%	100%
Reciprocal												
Number	191	7	15	213	191	7	15	213	100%	100%	100%	100%
Avg. Age	49.5	44.3	43.8	49.0	49.6	44.3	43.8	49.0	100%	100%	100%	100%
Avg. Service	4.6	4.0	4.6	4.6	4.6	4.0	4.6	4.6	100%	100%	100%	100%
Avg. Term Age	39.8	34.5	32.7	39.1	39.8	34.5	32.7	39.2	100%	100%	100%	100%
Contrib Balance	$ 57,683	$ 41,373	$ 74,479	$ 58,329	$ 57,683	$ 41,373	$ 74,479	$ 58,329	100%	100%	100%	100%
Retired												
Number	2,085	66	263	2,414	2,078	66	270	2,414	100%	100%	103%	100%
Avg. Age	69.2	63.9	63.4	68.4	69.2	63.9	63.6	68.4	100%	100%	100%	100%
Avg. RA	59.1	56.0	52.6	58.3	59.1	56.0	52.8	58.3	100%	100%	100%	100%
Beneficiaries												
Number	175	5	24	204	170	6	28	204	97%	120%	117%	100%
Avg. Age	75.7	73.2	73.4	75.4	75.7	74.3	73.5	75.4	100%	101%	100%	100%

Summary of Active Members by Valuation Group as of January 1, 2017 (Miscellaneous)

Group	Number	Avg. Age	Avg. Service	Avg. Pay
Units # 14, 21, 22				
GRS	26	44.4	8.4	$ 74,100
Bartel	26	44.4	8.4	$ 74,100
Ratio B	100%	100%	99%	100%
Management Non-Court - Units # 4, 7, 8, 9, 10, 11, 12, 17, 99				
GRS	443	48.6	11.8	$ 97,251
Bartel	443	48.6	11.8	$ 96,781
Ratio B	100%	100%	100%	100%
Management Court - Unit # 18				
GRS	11	50.8	9.6	$ 88,404
Bartel	11	50.8	9.6	$ 88,404
Ratio B	100%	100%	100%	100%
Management Court - Units # 24, 25, 26, 27				
GRS	28	53.5	15.3	$ 115,282
Bartel	28	53.5	15.3	$ 115,282
Ratio B	100%	100%	100%	100%
SLOCEA Non-Court - Units # 1, 2, 5, 13, 31, 98				
GRS	1,685	45.7	8.8	$ 57,941
Bartel	1,685	45.7	8.8	$ 56,987
Ratio B	100%	100%	100%	98%
SLOCEA Court - Unit # 19				
GRS	11	50.5	17.0	$ 70,886
Bartel	11	50.5	18.2	$ 71,881
Ratio B	100%	100%	107%	101%
SLOCEA Court - Unit # 20				
GRS	77	45.9	10.6	$ 54,590
Bartel	77	45.9	10.6	$ 54,083
Ratio B	100%	100%	100%	99%

Summary of Active Members by Valuation Group as of January 1, 2017
(Probation)

Group	Number	Avg. Age	Avg. Service	Avg. Pay
Probation Management - Units # 8, 9				
GRS	6	50.8	21.5	$ 125,459
Bartel	6	50.8	21.5	$ 125,459
Ratio B	100%	100%	100%	100%
Probation Non-Management - Units # 31, 32				
GRS	110	39.0	8.6	$ 68,455
Bartel	110	39.0	8.6	$ 68,455
Ratio B	100%	100%	100%	100%

Summary of Active Members by Valuation Group as of January 1, 2017
(Safety)

Group	Number	Avg. Age	Avg. Service	Avg. Pay
Safety Management - Units # 7, 10, 15, 16				
GRS	9	51.7	16.7	$ 145,742
Bartel	9	51.7	16.7	$ 145,742
Ratio B	100%	100%	100%	100%
Safety Non-Management - Units # 3, 6, 14, 27, 28				
GRS	269	40.7	11.0	$ 87,739
Bartel	269	40.7	11.0	$ 87,739
Ratio B	100%	100%	100%	100%

APPENDIX A
MEMBERSHIP DETAIL

Summary of Active Members by Tiers as of January 1, 2017

	GRS Valuation Data		SLOCPT Data Processed by Bartel		Ratio Bartel/GRS	
Group	Number	Total Pay ('000)	Number	Total Pay ('000)	Number	Total Pay ('000)
Miscellaneous						
Tier 1	1,303	$ 95,822	1,303	$ 95,274	100%	99%
Tier 2	264	18,375	264	18,131	100%	99%
Tier 3	714	37,627	714	36,574	100%	97%
Total	2,281	151,824	2,281	149,979	100%	99%
Probation						
Tier 1	84	6,563	84	$ 6,563	100%	100%
Tier 2	-	-	-	-	n/a	n/a
Tier 3	32	1,720	32	1,720	100%	100%
Total	116	8,283	116	8,283	100%	100%
Safety						
Tier 1	175	16,542	175	$ 16,542	100%	100%
Tier 2	51	4,474	51	4,474	100%	100%
Tier 3	52	3,897	52	3,897	100%	100%
Total	278	24,913	278	24,913	100%	100%

Age & Service Distribution of Active Members by Count as of January 1, 2017
Miscellaneous Members

GRS Valuation Data

Age	Years of Service 0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Compensation Total
20-24	36	-	-	-	-	-	-	36	$1,497,371
25-29	158	11	1	-	-	-	-	170	8,171,654
30-34	194	54	21	1	-	-	-	270	15,345,470
35-39	151	81	49	15	-	-	-	296	19,052,738
40-44	100	50	52	41	4	-	-	247	17,109,941
45-49	70	51	64	75	15	9	-	284	20,175,430
50-54	64	45	69	78	33	31	13	333	24,047,773
55-59	60	48	76	63	40	38	27	352	25,478,000
60-64	34	35	48	47	24	30	9	227	16,148,253
65-69	6	9	12	13	6	5	1	52	3,961,734
70-74	2	4	3	3	-	-	1	13	758,032
75+	-	1	-	-	-	-	-	1	77,106
Totals	875	389	395	336	122	113	51	2,281	$151,823,503

SLOCPT Data Processed by Bartel Associates

Age	Years of Service 0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Compensation Total
20-24	36	-	-	-	-	-	-	36	$1,438,346
25-29	162	7	1	-	-	-	-	170	8,065,540
30-34	202	55	12	1	-	-	-	270	15,041,420
35-39	162	80	42	12	-	-	-	296	18,733,055
40-44	106	50	60	27	4	-	-	247	17,027,005
45-49	75	55	63	68	15	8	-	284	19,882,328
50-54	66	47	72	74	30	31	13	333	23,861,727
55-59	65	54	71	62	40	38	22	352	25,434,163
60-64	40	35	49	42	23	30	8	227	15,818,377
65-69	8	8	13	13	4	5	1	52	3,879,940
70-74	3	4	3	2	-	-	1	13	720,350
75+	-	1	-	-	-	-	-	1	77,106
Totals	925	396	386	301	116	112	45	2,281	$149,979,357

Ratio Bartel/GRS

Age	Years of Service 0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Compensation Total
20-24	100%	100%	100%	100%	100%	100%	100%	100%	96%
25-29	103%	64%	100%	100%	100%	100%	100%	100%	99%
30-34	104%	102%	57%	100%	100%	100%	100%	100%	98%
35-39	107%	99%	86%	80%	100%	100%	100%	100%	98%
40-44	106%	100%	115%	66%	100%	100%	100%	100%	100%
45-49	107%	108%	98%	91%	100%	89%	100%	100%	99%
50-54	103%	104%	104%	95%	91%	100%	100%	100%	99%
55-59	108%	113%	93%	98%	100%	100%	81%	100%	100%
60-64	118%	100%	102%	89%	96%	100%	89%	100%	98%
65-69	133%	89%	108%	100%	67%	100%	100%	100%	98%
70-74	150%	100%	100%	67%	100%	100%	100%	100%	95%
75+	100%	100%	100%	100%	100%	100%	100%	100%	100%
Totals	106%	102%	98%	90%	95%	99%	88%	100%	99%

APPENDIX A
MEMBERSHIP DETAIL

Age & Service Distribution of Active Members by Count as of January 1, 2017
Probation Members

GRS Valuation Data

	Years of Service								Compensation
Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Total
20-24	4	-	-	-	-	-	-	4	$191,526
25-29	15	1	-	-	-	-	-	16	901,347
30-34	9	10	3	-	-	-	-	22	1,458,829
35-39	7	6	10	-	-	-	-	23	1,659,840
40-44	3	1	4	4	1	-	-	13	1,009,674
45-49	4	5	3	4	5	-	-	21	1,601,808
50-54	-	-	-	6	3	2	-	11	963,664
55-59	1	-	-	1	-	2	-	4	342,222
60-64	-	-	1	1	-	-	-	2	153,920
65-69	-	-	-	-	-	-	-	-	-
70-74	-	-	-	-	-	-	-	-	-
75+	-	-	-	-	-	-	-	-	-
Totals	43	23	21	16	9	4	-	116	$8,282,830

SLOCPT Data Processed by Bartel Associates

	Years of Service								Compensation
Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Total
20-24	4	-	-	-	-	-	-	4	$ 191,528
25-29	16	-	-	-	-	-	-	16	901,348
30-34	9	11	2	-	-	-	-	22	1,458,829
35-39	8	6	9	-	-	-	-	23	1,659,837
40-44	3	1	6	3	-	-	-	13	1,009,672
45-49	4	5	3	7	2	-	-	21	1,601,806
50-54	-	-	1	6	2	2	-	11	963,661
55-59	1	-	-	1	-	2	-	4	342,222
60-64	-	-	1	1	-	-	-	2	153,920
65-69	-	-	-	-	-	-	-	-	-
70-74	-	-	-	-	-	-	-	-	-
75+	-	-	-	-	-	-	-	-	-
Totals	45	23	22	18	4	4	-	116	$ 8,282,823

Ratio Bartel/GRS

	Years of Service								Compensation
Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Total
20-24	100%	100%	100%	100%	100%	100%	100%	100%	100%
25-29	107%	100%	100%	100%	100%	100%	100%	100%	100%
30-34	100%	110%	67%	100%	100%	100%	100%	100%	100%
35-39	114%	100%	90%	100%	100%	100%	100%	100%	100%
40-44	100%	100%	150%	75%	100%	100%	100%	100%	100%
45-49	100%	100%	100%	175%	40%	100%	100%	100%	100%
50-54	100%	100%	100%	100%	67%	100%	100%	100%	100%
55-59	100%	100%	100%	100%	100%	100%	100%	100%	100%
60-64	100%	100%	100%	100%	100%	100%	100%	100%	100%
65-69	100%	100%	100%	100%	100%	100%	100%	100%	100%
70-74	100%	100%	100%	100%	100%	100%	100%	100%	100%
75+	100%	100%	100%	100%	100%	100%	100%	100%	100%
Totals	105%	100%	105%	113%	44%	100%	100%	100%	100%

Age & Service Distribution of Active Members by Count as of January 1, 2017
Safety Members

GRS Valuation Data

Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Compensation Total
20-24	8	-	-	-	-	-	-	8	$556,712
25-29	23	6	-	-	-	-	-	29	2,271,610
30-34	24	15	6	-	-	-	-	45	3,783,041
35-39	12	14	14	8	-	-	-	48	4,252,081
40-44	9	5	15	11	6	-	-	46	4,176,432
45-49	3	6	4	11	19	9	-	52	4,975,464
50-54	3	3	3	4	13	9	-	35	3,488,930
55-59	3	1	-	4	2	2	-	12	1,109,306
60-64	-	-	1	-	1	-	-	2	181,064
65-69	1	-	-	-	-	-	-	1	118,775
70-74	-	-	-	-	-	-	-	-	-
75+	-	-	-	-	-	-	-	-	-
Totals	86	50	43	38	41	20	-	278	$24,913,415

SLOCPT Data Processed by Bartel Associates

Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Compensation Total
20-24	8	-	-	-	-	-	-	8	$ 556,711
25-29	27	2	-	-	-	-	-	29	2,271,610
30-34	27	16	2	-	-	-	-	45	3,783,039
35-39	15	13	14	6	-	-	-	48	4,252,079
40-44	10	5	16	10	5	-	-	46	4,176,426
45-49	4	5	5	10	22	6	-	52	4,975,456
50-54	4	2	4	6	11	8	-	35	3,488,922
55-59	3	1	-	4	2	2	-	12	1,109,303
60-64	-	-	1	-	1	-	-	2	181,064
65-69	1	-	-	-	-	-	-	1	118,775
70-74	-	-	-	-	-	-	-	-	-
75+	-	-	-	-	-	-	-	-	-
Totals	99	44	42	36	41	16	-	278	$ 24,913,385

Ratio Bartel/GRS

Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Totals	Compensation Total
20-24	100%	100%	100%	100%	100%	100%	100%	100%	100%
25-29	117%	33%	100%	100%	100%	100%	100%	100%	100%
30-34	113%	107%	33%	100%	100%	100%	100%	100%	100%
35-39	125%	93%	100%	75%	100%	100%	100%	100%	100%
40-44	111%	100%	107%	91%	83%	100%	100%	100%	100%
45-49	133%	83%	125%	91%	116%	67%	100%	100%	100%
50-54	133%	67%	133%	150%	85%	89%	100%	100%	100%
55-59	100%	100%	100%	100%	100%	100%	100%	100%	100%
60-64	100%	100%	100%	100%	100%	100%	100%	100%	100%
65-69	100%	100%	100%	100%	100%	100%	100%	100%	100%
70-74	100%	100%	100%	100%	100%	100%	100%	100%	100%
75+	100%	100%	100%	100%	100%	100%	100%	100%	100%
Totals	115%	88%	98%	95%	100%	80%	100%	100%	100%

APPENDIX B
DETAIL OF SAMPLE LIVES

				Bartel Associates			GRS			Ratio Bartel / GRS		
Sample	Status	Misc / Probation / Safety	Tier	Present Value of Future Benefits	Actuarial Liability	Normal Cost %	Present Value of Future Benefits	Actuarial Liability	Normal Cost %	Present Value of Future Benefits	Actuarial Liability	Normal Cost %
1	Active	Misc	1	1,078,661	822,859	23.7%	1,072,645	829,361	24.6%	101%	99%	96%
2	Active	Misc	1	438,292	421,852	9.6%	444,385	427,869	12.4%	99%	99%	78%
3	Active	Misc	1	356,615	163,136	31.3%	349,191	164,133	32.4%	102%	99%	97%
4	Active	Misc	3	168,665	28,632	24.5%	158,395	32,911	25.7%	106%	87%	95%
5	Active	Safety	1	713,652	591,558	31.7%	708,577	600,352	32.5%	101%	99%	98%
6	Active	Safety	2	569,554	270,935	34.6%	607,203	308,382	37.1%	94%	88%	93%
7	Active	Safety	2	313,230	-	39.5%	292,846	677	39.9%	107%	0%	99%
8	Active	Probation	3	215,403	54,816	26.8%	215,389	56,623	27.7%	100%	97%	97%
9	Terminated	Misc	1	232,767	232,767	N/A	229,156	229,156	N/A	102%	102%	N/A
10	Terminated	Misc	1	44,879	44,879	N/A	44,699	44,699	N/A	100%	100%	N/A
11	DROP	Safety	1	130,677	130,677	N/A	129,876	129,876	N/A	101%	101%	N/A
12	Service Retirement	Misc	1	1,126,866	1,126,866	N/A	1,117,904	1,117,904	N/A	101%	101%	N/A
13	Service Retirement	Misc	1	1,108,740	1,108,740	N/A	1,063,075	1,063,075	N/A	104%	104%	N/A
14	Service Retirement	Misc	1	187,032	187,032	N/A	184,330	184,330	N/A	101%	101%	N/A
15	Service Retirement	Probation	1	1,091,511	1,091,511	N/A	1,261,460	1,261,460	N/A	87%	87%	N/A
16	Service Retirement	Safety	1	496,103	496,103	N/A	487,244	487,244	N/A	102%	102%	N/A

APPENDIX C

DETAIL OF ACTUARIAL LIABILITIES BY TIER

(Amounts in $000s)

Miscellaneous												
	Bartel Associates				GRS Valuation				Ratio Bartel / GRS			
	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Tier 3	Total
Present Value of Future Benefits (PVFB)									Present Value of Future Benefits (PVI			
Actives	605,260	41,597	59,899	706,756	606,374	41,577	60,230	708,181	99.8%	100.0%	99.5%	99.8%
Retirees and Beneficiaries	842,826	168	-	842,994	864,597	167	-	864,764	97.5%	100.7%	N/A	97.5%
Deferred and Reciprocal	56,260	540	131	56,931	56,419	633	125	57,177	99.7%	85.3%	104.9%	99.6%
Total	1,504,346	42,304	60,030	1,606,680	1,527,389	42,377	60,355	1,630,122	98.5%	99.8%	99.5%	98.6%
Actuarial Accured Liability (AAL)									Actuarial Accured Liability (AAL)			
Actives	469,903	14,008	8,999	492,910	472,054	14,117	9,338	495,508	99.5%	99.2%	96.4%	99.5%
Retirees and Beneficiaries	842,826	168	-	842,994	864,597	167	-	864,764	97.5%	100.7%	N/A	97.5%
Deferred and Reciprocal	56,260	540	131	56,931	56,419	633	125	57,177	99.7%	85.3%	104.9%	99.6%
Total	1,368,988	14,716	9,130	1,392,835	1,393,070	14,917	9,463	1,417,449	98.3%	98.7%	96.5%	98.3%
Total Normal Cost (TNC)									Total Normal Cost (TNC)			
Actives	21.7%	17.4%	14.9%	19.5%	22.7%	17.7%	15.1%	20.1%	95.8%	98.5%	98.7%	96.8%

Probation												
	Bartel Associates				GRS Valuation				Ratio Bartel / GRS			
	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Tier 3	Total
Present Value of Future Benefits (PVFB)									Present Value of Future Benefits (PVI			
Actives	42,663	-	4,728	47,391	40,518	-	3,920	44,438	105.3%	N/A	120.6%	106.6%
Retirees and Beneficiaries	42,357	-	-	42,357	43,152	-	-	43,152	98.2%	N/A	N/A	98.2%
Deferred and Reciprocal	1,866	-	-	1,866	1,885	-	-	1,885	99.0%	N/A	N/A	99.0%
Total	86,886	-	4,728	91,615	85,555	-	3,920	89,475	101.6%	N/A	120.6%	102.4%
Actuarial Accured Liability (AAL)									Actuarial Accured Liability (AAL)			
Actives	28,327	-	480	28,807	28,121	-	464	28,585	100.7%	N/A	103.5%	100.8%
Retirees and Beneficiaries	42,357	-	-	42,357	43,152	-	-	43,152	98.2%	N/A	N/A	98.2%
Deferred and Reciprocal	1,866	-	-	1,866	1,885	-	-	1,885	99.0%	N/A	N/A	99.0%
Total	72,551	-	480	73,030	73,158	-	464	73,622	99.2%	N/A	103.5%	99.2%
Total Normal Cost (TNC)									Total Normal Cost (TNC)			
Actives	23.7%	N/A	20.2%	22.9%	23.7%	-	19.1%	22.7%	99.8%	N/A	105.8%	101.0%

Safety												
	Bartel Associates				GRS Valuation				Ratio Bartel / GRS			
	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Tier 3	Total
Present Value of Future Benefits (PVFB)									Present Value of Future Benefits (PVI			
Actives	130,145	16,187	11,484	157,816	130,196	16,150	11,762	158,109	100.0%	100.2%	97.6%	99.8%
Retirees and Beneficiaries	222,766	-	-	222,766	227,027	-	-	227,027	98.1%	N/A	N/A	98.1%
Deferred and Reciprocal	5,395	86	-	5,481	5,328	112	-	5,441	101.3%	76.7%	N/A	100.7%
Total	358,306	16,273	11,484	386,063	362,552	16,263	11,762	390,577	98.8%	100.1%	97.6%	98.8%
Actuarial Accured Liability (AAL)									Actuarial Accured Liability (AAL)			
Actives	97,188	3,881	1,244	102,313	98,427	4,050	1,327	103,804	98.7%	95.8%	93.8%	98.6%
Retirees and Beneficiaries	222,766	-	-	222,766	227,027	-	-	227,027	98.1%	N/A	N/A	98.1%
Deferred and Reciprocal	5,395	86	-	5,481	5,328	112	-	5,441	101.3%	76.7%	N/A	100.7%
Total	325,349	3,967	1,244	330,560	330,782	4,163	1,327	336,271	98.4%	95.3%	93.8%	98.3%
Total Normal Cost (TNC)									Total Normal Cost (TNC)			
Actives	26.4%	26.0%	23.0%	25.8%	27.0%	26.2%	23.3%	26.3%	97.8%	99.3%	98.9%	98.3%

APPENDIX C
DETAIL OF ACTUARIAL LIABILITIES BY TIER

Total												
	Bartel Associates				GRS Valuation				Ratio Bartel / GRS			
	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Tier 3	Total
Present Value of Future Benefits (PVFB)									Present Value of Future Benefits (PVI			
Actives	778,068	57,783	76,112	911,963	777,088	57,727	75,912	910,728	100.1%	100.1%	100.3%	100.1%
Retirees and Beneficiaries	1,107,948	168	-	1,108,116	1,134,776	167	-	1,134,943	97.6%	100.7%	N/A	97.6%
Deferred and Reciprocal	63,521	626	131	64,279	63,632	746	125	64,503	99.8%	84.0%	104.9%	99.7%
Total	1,949,538	58,577	76,243	2,084,358	1,975,496	58,640	76,037	2,110,173	98.7%	99.9%	100.3%	98.8%
Actuarial Accured Liability (AAL)									Actuarial Accured Liability (AAL)			
Actives	595,419	17,890	10,722	624,031	598,602	18,167	11,128	627,897	99.5%	98.5%	96.4%	99.4%
Retirees and Beneficiaries	1,107,948	168	-	1,108,116	1,134,776	167	-	1,134,943	97.6%	100.7%	N/A	97.6%
Deferred and Reciprocal	63,521	626	131	64,279	63,632	746	125	64,503	99.8%	84.0%	104.9%	99.7%
Total	1,766,888	18,684	10,854	1,796,425	1,797,010	19,079	11,253	1,827,342	98.3%	97.9%	96.5%	98.3%
Total Normal Cost (TNC)									Total Normal Cost (TNC)			
Actives	22.5%	19.1%	15.9%	20.5%	23.3%	19.4%	16.0%	21.1%	96.3%	98.7%	99.0%	97.3%

2017 Actuarial Audit

Gabriel Roeder Smith comments

A review of the actuarial audit of the SLOCPT by Bartel Associates

Audit report page and item description	Issue	GRS Comments	Estimated Contribution Rate Impact
Valuation Review			
Page 4 Survivor benefits	Data for Option 7 will be provided	We concur and will use actual data in the valuation rather than an estimate for the option 7 benefit-	None or minimal
Page 4 Contribution Balance	GRS thought the contribution balance was as of retirement date-impacts the return of contributions upon a retiree's death	GRS will update records to reflect that the balance is as of valuation date.	None or minimal
Page 4 Data error on a sample life	The post 62 benefit was missing but later provided; GRS failed to value it on that member	This has been updated for that member and will be valued January 1, 2018	None
Page 7 Option 3 Retirees	GRS's values the spouse benefit different than actual practice	GRS will review and update to match actual practice	None or minimal
Page 7 Tier 2 picked up contributions	Need to clarify treatment of these contributions for benefits	GRS concurs and will clarify and update valuation procedures as appropriate	None-We misspoke to Bartel; we do not apply the load for Tier 2.
Page 8 Showing the pre-payment	GRS will show as the asset statement illustrates	GRS will update report	None
Page 12 Amortization	Discuss alternative amortization options	GRS concurs and is working on a discussion in connection with the experience study	None -until Board adopts a new amortization method
Page 12 Expenses	Separate out administrative expenses in the valuation	GRS will provide this alternative in the experience study	None-until Board adopts new treatment of expenses
Page 12 PEPRA compensation limits	State more fully in the report	GRS will update wording	None
Page 14 Typo	We will fix the typo on termination rates	GRS will update wording	None
Page 14 PEPRA	We will add clarity on when PEPRA compensation applies	GRS will update wording	None
Page 14 Tier 3 member	We will work with staff on the	GRS will update wording	None

rates	disclosures		
Page 14 Cola banks	We will add a disclosure about how the cola bank is used	GRS will update wording	None
	Experience Study Review		
Page 22 Include more Graphs	GRS can include more graphs	GRS will review and add as appropriate	None
Page 22 Data	GRS can show exposures by age group	GRS will review and add as appropriate	None
Page 22 R-squared	Bartel recommends using R squared to show the fit of the data	GRS will review and add as appropriate	None
Page 22- show both old and new full tables	GRS will add these tables	GRS will review and add as appropriate	None
Page 22 Salary increases	Bartel recommends using separate merit increase tables for each group; also document the method more fully	GRS will add to reports and look at salary by group	None
Page 23 Disablements	Bartel recommends disclosure of the source of the current disablement rates and to incorporate more years into the study since there is so little data.	GRS will provide additional disclosures and look at more data.	None
Page 24 Mortality	Bartel recommends liability weighting the mortality table and looking at using a table like CalPERS.	GRS will review both issues with the experience study	None
Page 25 Retirement rates Safety	Bartel recommends examining retirement rates for Safety	GRS concurs and will provide with the experience study	None
Page 25 Reciprocal benefits	Recommends a review with the experience study	GRS concurs and will provide with the experience study	None
Page 25 Retirement Age -Inactives	Recommends a review with the experience study	GRS concurs and will provide with the experience study	None
Page 26 Supplemental contributions	No recommendation made	GRS will review this assumption	None
Page 26 Service	Review the service field and its use	GRS will review this data field and its use with staff	None

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San Luis Obispo County
Pension Trust
SLOCPT

Date: March 26, 2018

To: Board of Trustees

From: Carl Nelson – Executive Secretary
Amy Burke – Deputy Executive Secretary

Agenda Item 8: Employer Contributions Prefunding

Recommendation:

The Board of Trustees should discuss, and approve actions based on the following:

1. To agree to the FY18-19 prefunding of employer contributions from the County of San Luis Obispo and the Air Pollution Control District consistent with the automatic renewal of the FY17-18 Prefunding Agreement (as amended in 2017) that provides for –

    a. Prefunding of employer paid contributions (including employee contributions paid for by the employer) by June 30th for the upcoming fiscal year in a lump sum instead of on a pay-period basis.

    b. Such prefunding to be calculated by SLOCPT's actuary using a discount rate adopted on an annual basis by the Board of Trustees. For the FY17-18 Prefunding the discount rate approved was the SLOCPT's then current Earnings Assumption less 1.00% (i.e., for 2017 this rate was 7.125% - 1.00% = 6.125%). **The recommended discount rate for FY18-19 Prefunding is the Earnings Assumption for the 2017 Actuarial Valuation of 7.125% less 1.50% which equals 5.625%.** The Board of Trustees may adopt a different discount rate for Prefunding at its discretion.

- OR –

2. To not agree to the FY18-19 prefunding of employer contributions and to provide the County the required 60 days' notice to terminate or suspend the FY17-18 Prefunding Agreement in existence.

Background:

Beginning with FY14-15 the Pension Trust and the County agreed to restart a prior practice of allowing the County to prepay employer pension contributions at the start of a fiscal year at a discounted rate. This agreement was amended in 2017 to set the discount rate to be used at a rate adopted on an annual basis by the Board of Trustees. The discount rate determined by the Board of Trustees in 2017 was the then current Earnings Assumption used less 1.00% (i.e., for 2017 this rate was 7.125% - 1.00% = 6.125%).

The basic premise for a retirement system to allow the plan sponsor to prefund employer contributions at a discounted rate is that the retirement system then has those funds to invest longer than it would were they to be received in pay-period increments throughout the year. So, for employer contributions, instead of the normal dollar-cost-averaging of investment inflows, a more lump sum pattern of inflows is created. Keep in mind that employee contributions that are not paid for by the employer continue to be made on a pay-period basis throughout the year.

- If the actual earnings on investments is <u>less</u> than the discount rate used for the prefunding, an actuarial loss is created that increases future contribution rates by a small amount. The normal actuarial smoothing of gains and losses spreads out this impact.

- If the actual earnings on investments are <u>greater</u> than the discount rate used for the prefunding, an actuarial gain is created that lowers future contribution rates by a small amount. The normal actuarial smoothing of gains and losses spreads out this impact.

From the plan sponsor's side, prefunded employer contributions discounted at a rate greater than that possible to be earned in the very conservative investments allowed for Treasury funds creates budget savings.

From the Pension Trust's side, *over the very long-term*, if the Earnings Assumption was used to discount the prefunding rate, prefunding should have an actuarially neutral effect. This is based on the long-term expectation that investment returns in any given year have 50/50 odds of being greater or lower than the long-term return assumption. To the extent that the discount rate actually used for employer contribution prefunding has been lower than the earnings assumption (e.g., Earnings Assumption less 1.00% or less 1.50%) it increases the probability that the Pension Trust will have net actuarial gains over the long term. However, in light of recent investment history and near-term market expectations it is appropriate to review and re-evaluate the practice.

The current market environment is one where investment returns are constrained by low interest rates and relatively high equity valuation levels. This makes the short-term potential for investment returns being below the discount rate used for prefunding greater than the long-term 50/50 probability. This is reflected in the intermediate (10 year) capital market expectations presented by Verus (investment consultant) in February being approximately 6.00%. Given the constrained 10 year Capital Market Expectations, it is Staff's recommendation to set the discount rate to be used for FY18-19 Prefunding at a rate of the 2017 Earnings Assumption less 1.50%. This equals 7.125% minus 1.50% = 5.625%.

Other California retirement systems have a range of practices in employer contribution prefunding including: no prefunding; prefunding discounted at the actuarial assumed rate of return; prefunding discounted at the actuarial assumed rate of return less a set spread (e.g., 0.50%); prefunding discounted at half of the actuarial assumed rate of return; or, prefunding at a rate considered and approved on an annual basis.

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Board of Trustees

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San Luis Obispo County
Pension Trust
SLOCPT

Date: March 26, 2018

To: Board of Trustees

From: Carl Nelson – Executive Secretary
Amy Burke – Deputy Executive Secretary
Scott Whalen - Verus

Agenda Item 9: TAO Contingent Fund – Opportunistic – Preliminary Recommendation

Recommendation:

Verus and Staff recommend –

- A commitment to the TAO Contingent Fund as part of the Opportunistic class in the Pension Trust's Investment Policy Statement (IPS).

- The commitment to the TAO Contingent Fund to be sized at $60 million. This commitment size over-commits the 3% allocation for individual Opportunistic investments per the IPS, but the amount invested at any time is expected to not exceed the 3% target.

The Board of Trustees actions recommended at this meeting are -

- To discuss and consider this preliminary recommendation to commit to TAO Contingent Fund. The final approval is recommended at the April 23, 2018 Board of Trustees meeting.

- To agree to incur legal costs for document review in anticipation of final approval in April. This prior document legal review will facilitate being able to meet a due date for the second close on this fund in late April/early May.

Background:

The Pension Trust has a 5% allocation to Private Credit. This allocation is filled with a commitment to a "fund-of-one" evergreen Limited Partnership (LP) structure with TPG/TSSP initiated in 4Q16. The TPG private credit fund invests in a variety of TPG managed closed-end LPs and is in the capital-call phase and is not yet fully funded.

TPG/TSSP is a large and sophisticated private credit management firm with substantial deal sourcing, funding and execution capabilities. The types of investments used in such strategies include distressed debt for control, direct lending (U.S. and Europe), asset backed financing and corporate dislocation financing.

One of the main funds in the TSSP platform is the TPG Adjacent Opportunities Fund (TAO). This LP structured fund invests in the full range of TPG opportunities. A portion of the Pension Trust's existing TPG/TSSP Private Credit fund invests in the various vintages of the present TAO fund. TAO is currently not open to new investments due to capacity constraints.

TAO Contingent Fund:

TPG/TSSP expects that at some point in the next three years that events of significant disruption to the credit markets are likely to occur. While the firm's underlying outlook for global economic health is positive, the likelihood of market disruption leading to unanticipated interest rate increases, unexpected increases in credit spreads (corporate interest rates vs. Treasury rates), distressed corporate borrowers and similar situations is high. At such points of market disruption investment funds that can deploy quickly have an advantage in investing at higher yields. Both Verus and TPG/TSSP describe the TAO Contingent fund as analogous to "a call option on opportunities from disruption".

To capitalize on such opportunities, TPG/TSSP is forming the TAO Contingent fund -

- Formed on a contingent basis – no capital called initially

- Can be activated at TPG/TSSP's discretion upon market disruption creating buying opportunities. Would probably be activated in at least two phases.

- Seeking "stand-by" commitments from investors for approximately $4 billion. TPG/TSSP expects that market opportunities in an environment of credit disruption will allow significantly more capacity in the TAO strategy – but with advantages for investors able to invest quickly.

- Up to a 3 year initial activation period from final close in 3Q18 to be in stand-by mode without invested funds. Initial activation period may be extended in 2 year periods at the option of the LPs and the General Partner (GP – or TSSP).

- Once activated, 3 year commitment period from initial activation date. It is during this period that capital calls from the LPs will be made.

- Fees – SLOCPT would pay a lower fee than new investors due to the existing funds with TPG -
    - Prior to activation – only costs are a pro rate share of the organizational expenses of the fund. No fees prior to activation is an innovative feature.
    - Upon activation – Fee on unfunded commitment = 0.65%, Fee on Invested Capital = 1.35%, Carried Interest for the GP (TSSP) = 17.50% over 5.00% preferred return on a deal-by-deal basis. These fees are typical for Private Equity and Private Credit LPs.

Verus Recommendation: Verus recommends to most of their clients a commitment to the TAO Contingent Fund as part of an Opportunistic asset allocation. The Pension Trust's IPS includes an Opportunistic asset allocation of 0% to 10% of the fund with a 3% limit on any one Opportunistic investment. The Opportunistic category has been used in 2010-2011 by the Pension Trust to fund a distressed credit LP fund and a mezzanine debt LP fund. Both of those closed-end funds have been fully distributed, or are substantially through their distribution phase.

Commitment size: Verus recommends a $60 million commitment to the TAO Contingent Fund which is more than 3% of the fund at present, but at any one time the TAO Contingent Fund allocation is not expected to go over the 3% limit. Similar over-commit targets are being used for Private Equity and Private Credit for the same reasons.

Source of funds: Should the TAO Contingent Fund be activated and capital called, the source of those funds within the Pension Trust's portfolio would be determined by the market conditions at the time and Verus' recommendations. Portfolios to be drawn down to fund the TAO Contingent Fund could be public market fixed income (e.g., core bonds), public market equities (domestic or international) or other portfolios as appropriate.

Closing schedule and legal review of LP documents: The initial closing on the TAO Contingent Fund has already taken place. A second closing date for LP commitments is expected in late April/early May. The final close is expected in 3Q17 and it is expected to be over-subscribed and with capacity constraints. As a result, staff recommends proceeding with legal counsel document review prior to final approval to expedite being able to make the commitment at the second closing date.

Staff is in full agreement with Verus' recommendation on the TAO Contingent Fund.

Attached is the Verus research write-up on TPG/TSSP and the TAO Contingent Fund.

Respectfully submitted

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Board of Trustees

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San Luis Obispo County Pension Trust
SLOCPT

Date: March 26, 2018

To: Board of Trustees

From: Carl Nelson – Executive Secretary
Amy Burke – Deputy Executive Secretary

Agenda Item 10: Investment Report for February 2018

	February	**Year to Date 2018**		2017	2016	2015	2014	2013
Total Trust Investments ($ millions)	$1,355			$1,351 year end	$1,196 year end	$1,148 year end	$1,190 year end	$1,131 year end
Total Fund Return	-2.2% Gross	**1.2**% Gross		15.5 % Gross	6.6 % Gross	-0.8 % Gross	5.1 % Gross	13.8% Gross
Policy Index Return (r)	-2.2%	0.0%		13.4 %	7.7 %	-0.5 %	5.2 %	13.4%

(r) Policy index as of Aug. 2016 revision to Strategic Asset Allocation Policy: 20% domestic equity, 20% international equity, 15% core bonds, 5% bank loans, 5% global bonds, 5% emerging market debt, 15% real estate, 5% commodities, 5% private equity, 5% private credit.

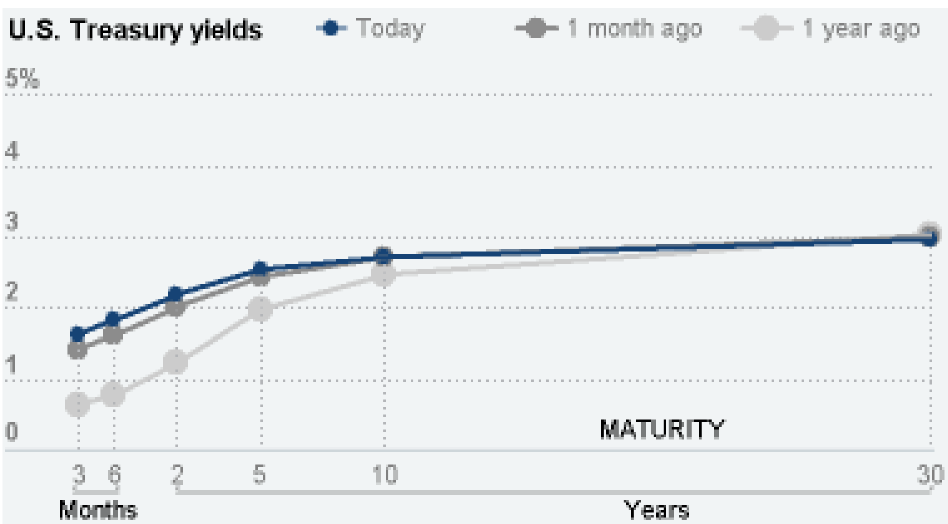
The Economy and Capital Markets:

Some significant factors in the economy for February and into mid-March have been –

- **Fed Policy** – Capital markets have a sharpened focus on Fed "rate normalization" interest rate increases with rekindled inflationary expectations.
    - The new Fed Chair, Jerome Powell, in his February 28th debut addressing the House Financial Services Committee commented on the increased outlook for growth.
    - The Fed has been signaling its intention for three rate increases in 2018, the capital markets increasingly appear to expect four rate increases for the year.

- The Fed met expectations with a 0.25% increase in the Fed Funds rate to a 1.50%-1.75% range at its March 21st meeting.
- The continued absence of significant upticks in inflation and the low rate of M2 growth have helped restrain market reactions to concerns over accelerated Fed rate increases.

- **Interest Rates –** Interest rates have risen in recent months in the expectation of future Fed increases.
  - In particular, the short end of the yield curve has risen in recent months reflecting these concerns.
  - Credit spreads (corporate vs. Treasury rates) remain in the low end of their historical range, albeit with some widening in March.
  - The February and March market anxiety over inflation incited increases in interest rates moved the yield curve up as shown below. The graph below shows the Treasury yield curve as of March 21st.



- **Trade Protectionism –** Capital markets were roiled on March 1st as President Trump announced steep tariffs on all imported steel and aluminum. The prospect of such tariffs igniting a trade war caused rapid selloffs in the equity markets. The impact of increased import costs due to protective tariffs further escalated concerns over resurgent inflation and its impact on the pace of Fed monetary policy normalization and rate increases. Later modification of the tariff imposition to exclude Canada and Mexico softened the impact on the capital markets. Further announcements on March 22nd of trade measures targeting China furthered the destabilizing impact on capital markets with 2.5% one-day equity market selloff and a decrease in Treasury interest rates from the flight-to-quality trade.

- **GDP Growth –**

  - ➢ The U.S. economy's 4Q17 growth rate was revised down to a 2.5% rate
  - ➢ The Fed revised it's 2018 expected GDP growth forecast upwards to 2.7%.

- **Employment and Wages** – from the February DOL report on nonfarm employment -

  - ➢ Jobs up 313k for nonfarm employment. A surprising gain of 313k new jobs – economists had expected a 200k gain.
  - ➢ Unemployment steady at a 17 year low of 4.1%.
  - ➢ Labor Force Participation increased from 62.7% to 63.0%. This suggests that a tight labor market is leading to some returning to the workforce. The labor force participation rate for the age 25-54 group (prime age workers) rose to 79.3% - the highest since mid-2008. The increased participation rate in the face of a strong 313k increase in jobs accounts for the unemployment rate not dropping below 4.1% as had been expected.
  - ➢ Wage growth restrained to a year-over-year increase of 2.6%. While below expectations, the modest increase in wages serves to calm capital market fears of increased wag-based inflation moving the Fed to faster-than-expected interest rate increases.

- **Capital Market Strength/Weakness and Volatility –**

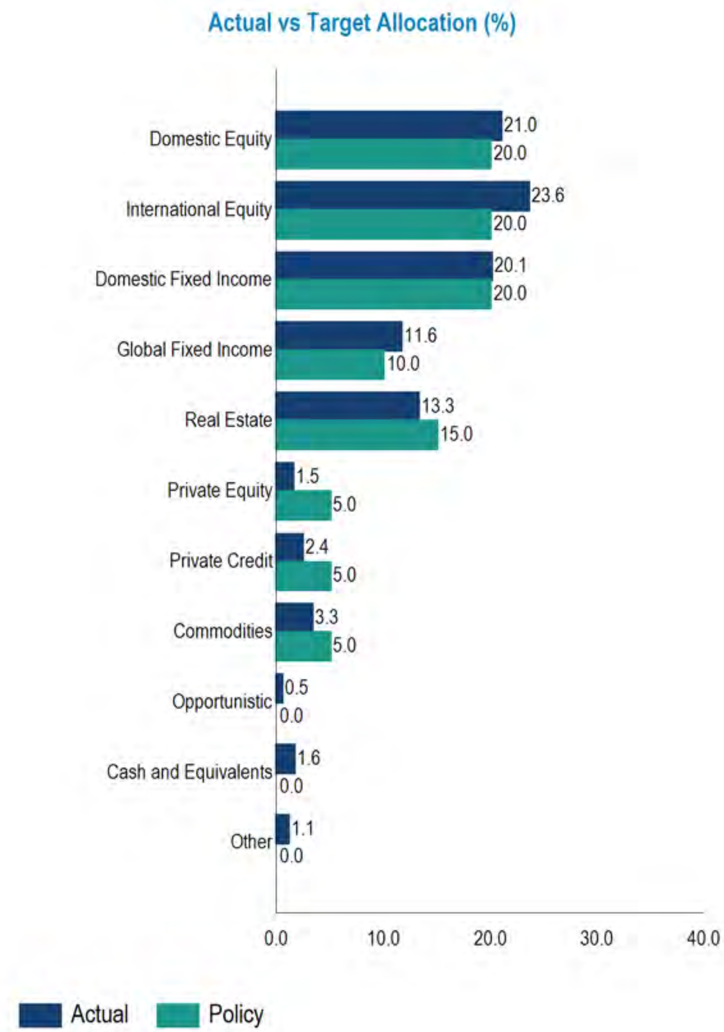
  - ➢ The synchronized global growth, accommodative global monetary policy, increasing corporate earnings with an added tailwind from U.S. Tax reform, have contributed to buoyant equity markets. As shown on the one-year graph of the S&P 500 index below.
  - ➢ February saw a market correction in equities sparked by inflation and interest rate increase fears.
  - ➢ March saw a trading more volatile market post-correction.
  - ➢ March 21st saw a market sell-off in response to fears over aggressive trade protectionist pronouncements from the U.S. Administration.

SLOCPT Investment Returns:

The attached report from Verus covers the investment returns of the SLOCPT portfolio and general market conditions through the end of February. Subsequent market movements in March have been negative and will be reported on in next month's investment report.

Respectfully submitted

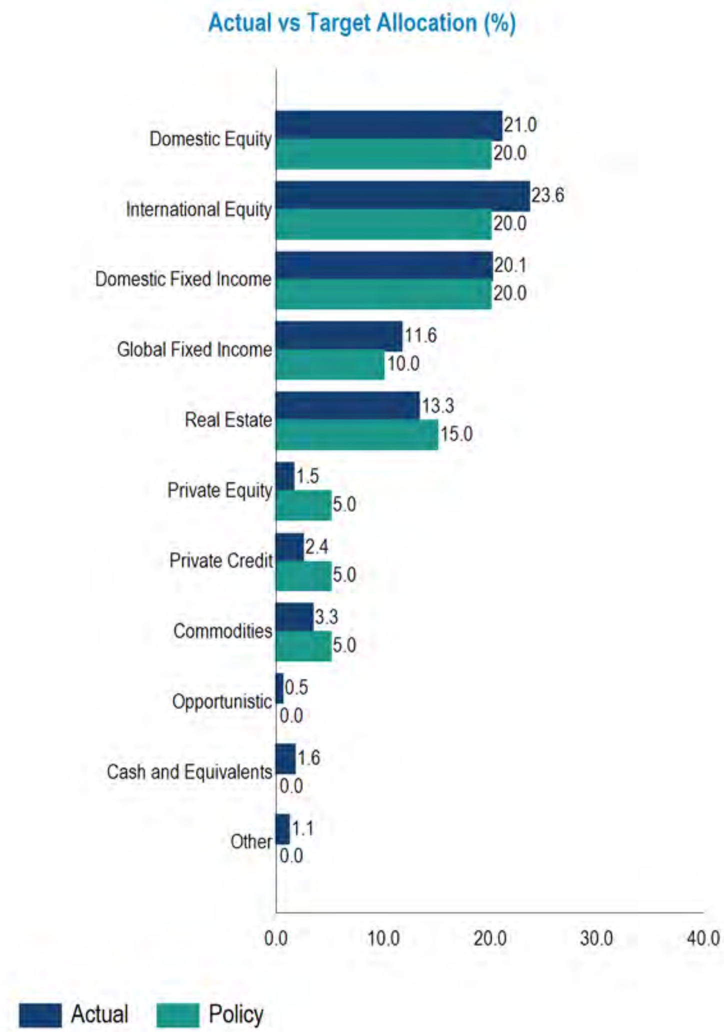
	Market Value	% of Portfolio	1 Mo	YTD
Total Fund	**1,354,678,361**	**100.0**	**-2.2**	**1.2**
Total Fund ex Overlay	1,339,831,872	98.9	-2.2	1.2
Policy Index			*-2.2*	*0.0*
Total Domestic Equity	**284,531,697**	**21.0**	**-3.9**	**1.9**
Russell 3000			*-3.7*	*1.4*
PIMCO RAE Fundamental PLUS Instl	59,946,591	4.4	-3.7	1.0
S&P 500			*-3.7*	*1.8*
Loomis Sayles Large Cap Growth	84,525,081	6.2	-3.9	4.2
Russell 1000 Growth			*-2.6*	*4.3*
Boston Partners Large Cap Value	82,302,303	6.1	-4.1	1.1
Russell 1000 Value			*-4.8*	*-1.1*
Atlanta Capital Mgmt	57,757,722	4.3	-3.7	0.6
Russell 2500			*-4.1*	*-1.2*
Total International Equity	**319,354,305**	**23.6**	**-4.7**	**0.8**
MSCI ACWI ex USA Gross			*-4.7*	*0.6*
Dodge & Cox Intl Stock	161,973,496	12.0	-5.3	0.8
MSCI EAFE Gross			*-4.5*	*0.3*
WCM International Growth	157,380,809	11.6	-4.1	0.9
MSCI ACWI ex USA Gross			*-4.7*	*0.6*
Total Domestic Fixed Income	**272,307,142**	**20.1**	**-0.5**	**-0.8**
BBgBarc US Aggregate TR			*-0.9*	*-2.1*
BlackRock Core Bond	98,679,693	7.3	-0.9	-2.0
BBgBarc US Aggregate TR			*-0.9*	*-2.1*
Dodge & Cox Income Fund	104,171,065	7.7	-0.7	-1.0
BBgBarc US Aggregate TR			*-0.9*	*-2.1*
Pacific Asset Corporate Loan	69,456,383	5.1	0.2	1.1
S&P/LSTA Leveraged Loan Index			*0.2*	*1.2*
Total Global Fixed	**157,615,761**	**11.6**	**-1.1**	**3.8**
Citi World Govt Bond Index			*-0.7*	*0.9*
Brandywine Global Fixed Income	78,900,203	5.8	-1.6	3.3
Citi WGBI ex US			*-0.7*	*2.5*
Stone Harbor Local Markets Ins	78,715,558	5.8	-0.5	4.4
JPM GBI-EM Global Diversified TR USD			*-1.0*	*3.4*



**Other balance represents Clifton Group.*

Policy Index (10/1/2016): 20% Russell 3000, 20% MSCI ACWI ex. US, 30% BBgBarc Aggregate, 15% NCREIF Property, 5% Bloomberg Commodity, 5% Russell 3000 + 300 bp, 5% BBgBarc High Yield + 200 bp lagged. Effective 1/01/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation. ARA American and Direct Real Estate MVs as of 12/31/2017 +/- calls and distributions. Boston Partners funded 2/1/2017. WCM Intl Growth replaced Vontobel on 2/15/2017. Pathway 9 funded 4/7/2017. SSGA TIPS liquidated on 12/7/2017. Fidelity Real Estate Growth III liquidated on 12/29/2017. SSGA Flagship S&P 500 liquidated 2/1/2018. All data is preliminary.

	Market Value	% of Portfolio	1 Mo	YTD
Total Real Estate	**179,518,064**	**13.3**	**0.8**	**1.7**
NCREIF Property Index			*0.0*	*0.0*
JP Morgan Core Real Estate	153,714,535	11.3	0.9	1.6
NCREIF-ODCE			*0.0*	*0.0*
NCREIF Property Index			*0.0*	*0.0*
ARA American Strategic Value Realty	11,838,299	0.9	0.0	2.0
NCREIF-ODCE			*0.0*	*0.0*
NCREIF Property Index			*0.0*	*0.0*
Direct Real Estate	13,965,230	1.0	0.0	2.7
NCREIF-ODCE			*0.0*	*0.0*
NCREIF Property Index			*0.0*	*0.0*
Total Commodities	**44,735,278**	**3.3**	**-2.1**	**0.2**
Bloomberg Commodity Index TR USD			*-1.7*	*0.2*
Gresham MTAP Commodity Builder	44,735,278	3.3	-2.1	0.2
Bloomberg Commodity Index TR USD			*-1.7*	*0.2*
Total Private Equity	**20,364,908**	**1.5**		
Harbourvest Partners IX Buyout Fund L.P.	13,412,090	1.0		
Pathway Private Equity Fund Investors 9 L.P.	6,952,818	0.5		
Total Private Credit	**32,571,528**	**2.4**		
TPG Diversified Credit Program	32,571,528	2.4		
Total Cash	**22,150,524**	**1.6**	**0.0**	**0.0**
91 Day T-Bills			*0.1*	*0.2*
Cash Account	22,150,524	1.6	0.0	0.0
91 Day T-Bills			*0.1*	*0.2*
Total Opportunistic	**6,682,665**	**0.5**		
Kohlberg Kravis Roberts & Co. Mezzanine Partners I	5,427,145	0.4		
PIMCO Distressed Credit Fund	1,255,520	0.1		
CPI + 5%				



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Verus

PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

FEBRUARY 2018

Capital Markets Update

Market commentary

ECONOMIC CLIMATE

— U.S. real GDP was revised downward to an annualized rate of 2.5% QoQ during the fourth quarter. A decrease in net exports was the largest detractor from growth.

— The Conference Board's Consumer Confidence Index rose to 130.8 in February, up from 124.3 in January. This reading was the highest since December 2000.

— The ISM Manufacturing PMI increased from 59.1 to 60.8 during the period, led by strong gains in employment and inventories.

— The U.S. economy added 313,000 jobs during the month of February, above expectations of 205,000. The unemployment rate held steady at 4.1% while the labor force participation rate rose 30 bps to 63.0%.

— Pending home sales fell 4.7% MoM (-1.7% YoY) in February. The National Association of Realtors has forecast a decline in home sales this year, citing low supply and higher mortgage rates.

DOMESTIC EQUITIES

— Domestic equities fell during the month for the first time since October 2016 as the S&P 500 returned -3.7%.

— As of March 2nd, with 97% of companies reporting, the blended Q4 earnings and revenue growth rates of the S&P 500 were 14.8% and 8.2% YoY, respectively. If both metrics hold, they will each be the highest respective growth rates since Q3 2011, according to FactSet.

DOMESTIC FIXED INCOME

— Domestic fixed income returns were negative in February as the Bloomberg Barclays U.S. Aggregate Index fell -0.9%.

— The U.S. Treasury curve steepened slightly over the month, led by higher long-term yields. The 10-year minus 2-year yield spread increased 6 bps to 0.64%.

— High Yield spreads rose to 3.5% during the month from a cycle low of 3.2% in January. However, spreads remain well below the 20-year average of 5.9%.

INTERNATIONAL MARKETS

— International equities experienced negative returns during the period as the MSCI ACWI ex U.S. Index fell -4.7% on an unhedged basis (-3.3% hedged).

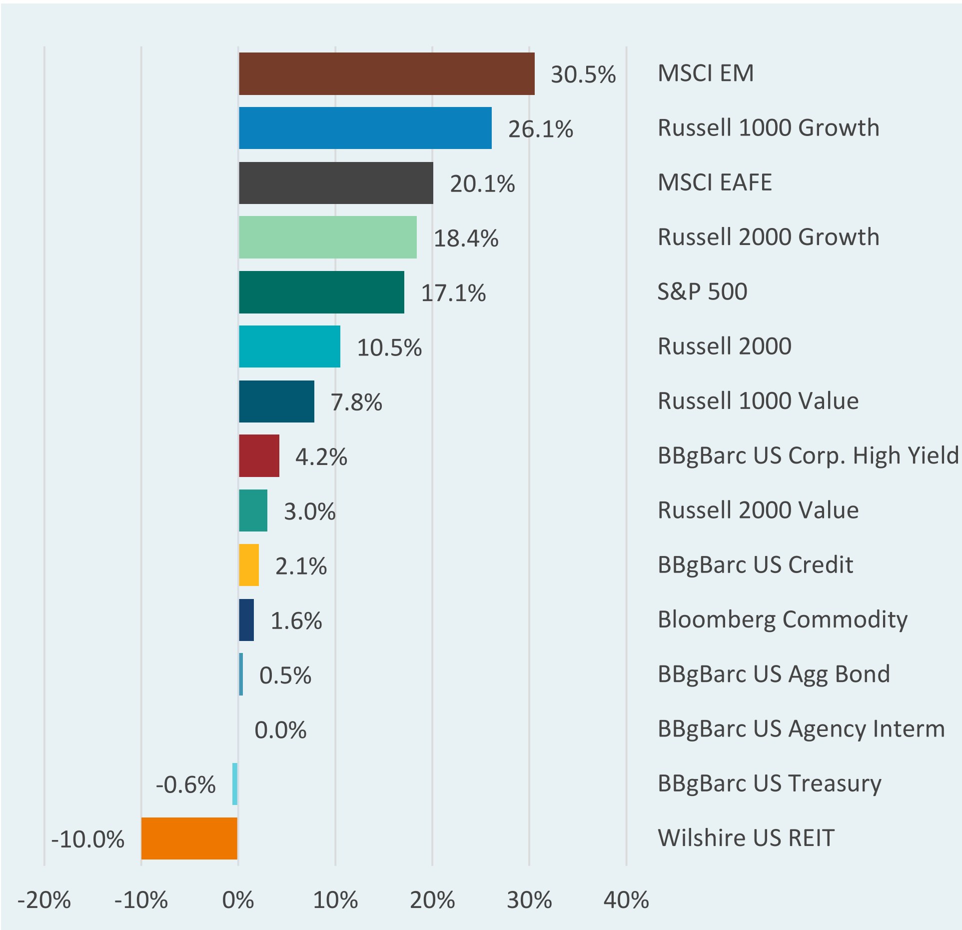
— Real GDP in the U.K. was revised down to 0.4% QoQ from the preliminary estimate of 0.5%. Calendar year 2017 GDP was also revised down 10 bps to 1.7% due to a decrease in the estimated output of the production industries.

— Eurozone Manufacturing PMI decreased to 58.5 in February, down from 59.6 in January, and the multi-year high of 60.6 in December.

— The European Central Bank left monetary policy unchanged at its latest meeting, but removed language that stated it would increase asset purchases in the event of a market downturn.

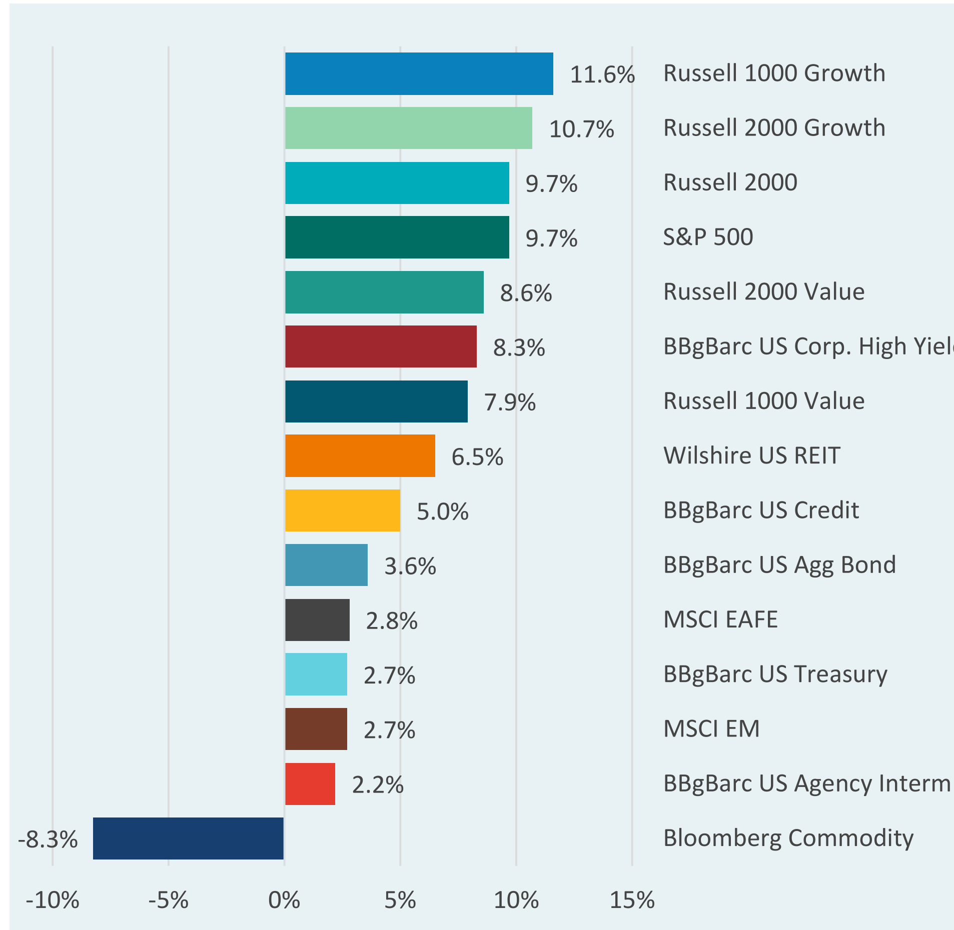
Major asset class returns

ONE YEAR ENDING FEBRUARY



Source: Morningstar, as of 2/28/18

TEN YEARS ENDING FEBRUARY



Source: Morningstar, as of 2/28/18

U.S. large cap equities

— The S&P 500 experienced a 10% drawdown at the beginning of the month that corresponded with a spike in implied volatility. Equities partially recovered, but had a negative monthly return for the first time since October 2016 (S&P 500 -3.7%). Realized volatility (30-day) jumped to 22.4% during the period, higher than the 5-year average of 12.2%.

— Implied volatility (VIX Index) rose above 50 at one point, jolting markets from a period of extraordinary low levels. The move may have been exacerbated by a build up in short volatility trades.

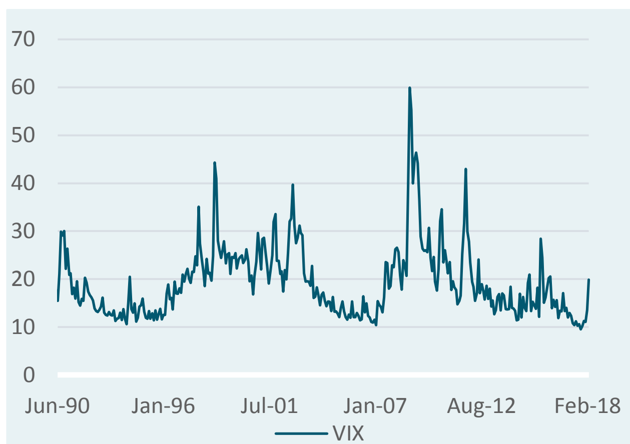
— Energy and Consumer Staples shares led the way down during the month. The S&P 500 Energy sector fell 10.8%, marking the worst month for the sector since September 2011. Out of the 11 sectors, Technology was the only positive performer, returning 0.1%.

— With equity prices falling in February, most valuation metrics moved back towards historical levels. The trailing and forward P/E ratios decreased from 22.8 and 17.9 to 21.9 and 17.0, respectively. However, they still remain above their respective 10-year averages of 17.5 and 15.6.

S&P 500 PRICE INDEX

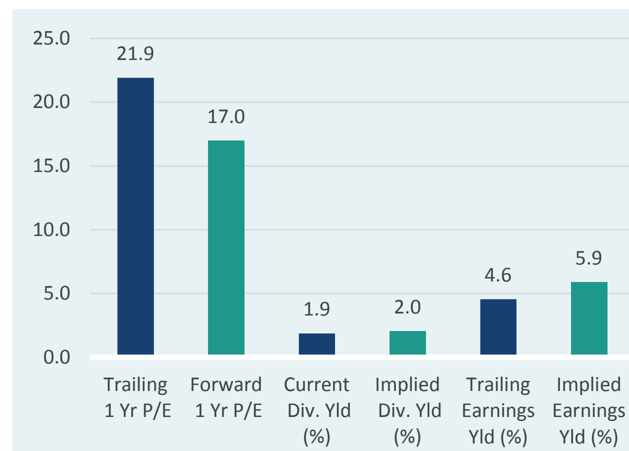
Source: Bloomberg, as of 2/28/18

IMPLIED VOLATILITY



Source: CBOE, as of 2/28/18

S&P 500 VALUATION SNAPSHOT



Source: Bloomberg, as of 2/28/18

Agenda Item 10

Fixed income

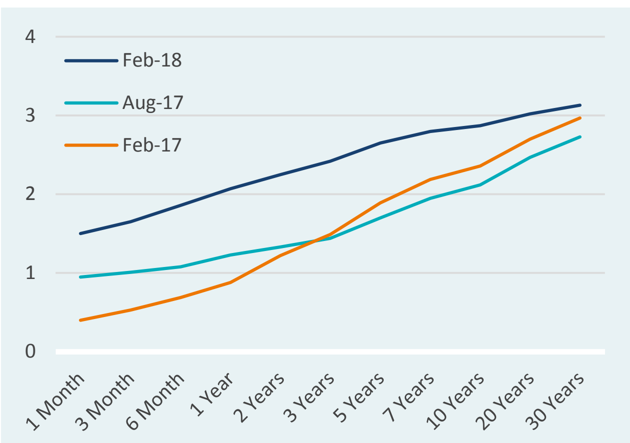
— Markets are expecting three interest rate hikes during 2018, according to fed funds futures pricing, in line with what the Fed has been communicating in recent meeting. In his first comments since becoming Fed Chairman, Jerome Powell noted that Fed guidance may need to be revised towards quicker tightening based on the current strength of the economy.

— Yields rose broadly across fixed income asset classes in February. The EMBI-Global Index (hard currency EM debt) and BBgBarc U.S. Corporate High Yield Index saw the largest moves, rising 40 bps and 30 bps, respectively.

— After marking a recent low of 85 bps on February 2nd, Investment Grade spreads rose throughout the month and ended 11 bps higher at 96 bps.

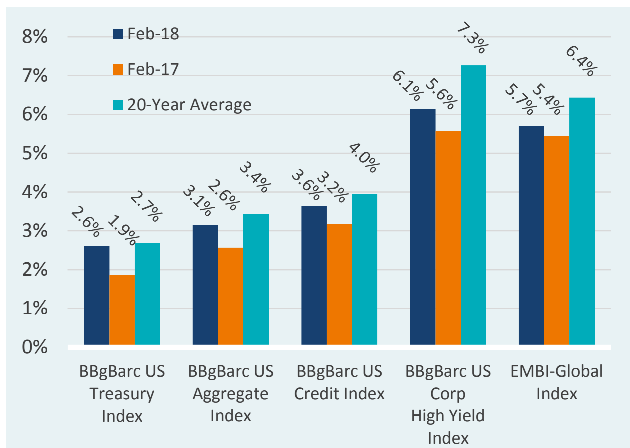
— The U.S. Treasury curve (2-10 yield spread) steepened slightly, rising 4 bps to 0.62% during the month – the BBgBarc U.S. Treasury Long Index underperformed the BBgBarc 1-3 Year U.S. Treasury Index by 3.0% in February, and 5.7% YTD.

U.S. TREASURY YIELD CURVE



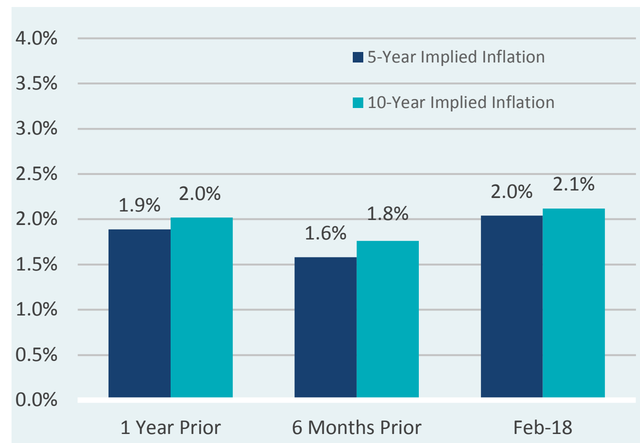
Source: Bloomberg, as of 2/28/18

NOMINAL FIXED INCOME YIELDS



Source: Morningstar, as of 2/28/18

IMPLIED INFLATION (TIPS BREAKEVEN)



Source: Federal Reserve, as of 2/28/18

Global markets

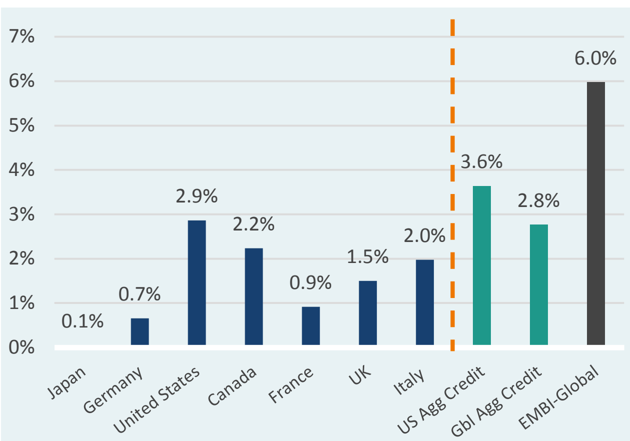
— The drawdown in global equities was consistent across markets with most regional benchmarks down around 10%. The pullback did not appear to be driven by any change in economic or corporate fundamentals and most markets started to recover towards the end of the month. However, international developed and emerging market equities did not recover as much as U.S. equities.

— International equities underperformed U.S. equities in the month as the MSCI ACWI ex U.S. Index fell 4.7% (S&P 500 -3.7%). Equities in the U.K. experienced the largest decline – the MSCI U.K. Index dropped 6.4%.

— The Japanese yen (+2.3%) outperformed the euro and the British pound (-2.1% and -3.1%) against the U.S. dollar in February, possibly benefitting from safe haven flows during the period of elevated volatility in other asset classes.

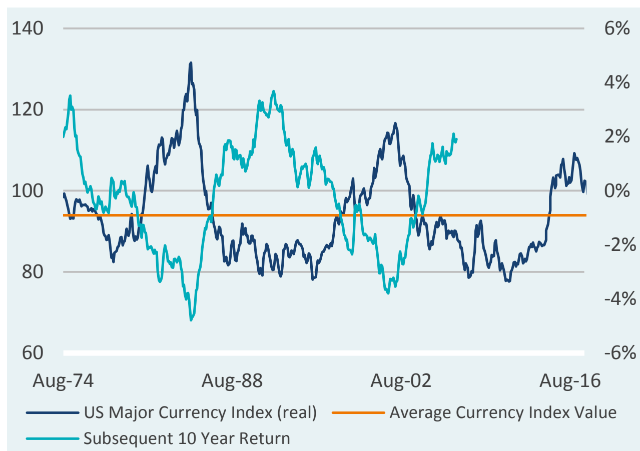
— Global equity valuations decreased during the month across most regions, led by EAFE markets, where the trailing 12-month P/E ratio dropped to 17.9 from 19.7. The contraction in developed market valuations was driven by both falling prices and rising earnings.

GLOBAL SOVEREIGN 10-YEAR YIELDS



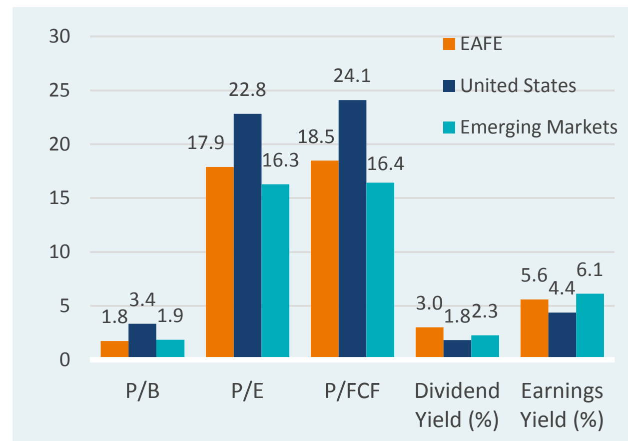
Source: Bloomberg, as of 2/28/18

U.S. DOLLAR MAJOR CURRENCY INDEX



Source: Federal Reserve, as of 2/28/18

MSCI VALUATION METRICS (3-MONTH AVERAGE)

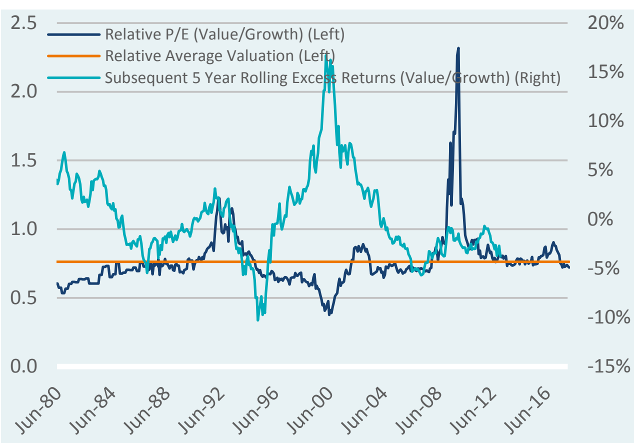


Source: Bloomberg, as of 2/28/18

Domestic equity size and style

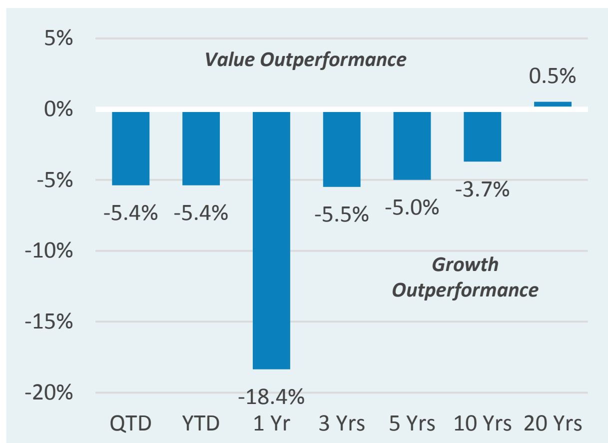
- Large cap equities narrowly outperformed small cap equities (Russell 1000 -3.7%, Russell 2000 -3.9%) during the period. Telecommunications companies contributed the most to this outperformance, with large caps returning 2.5% more than their small cap peers in February, and 25.1% more over the last year.
- The period of small cap outperformance following the U.S. election has faded. Over the past year, large cap equities have outperformed small cap equities by 6.2%.
- Growth-oriented equities (Russell 1000 Growth -2.6%) outperformed value-oriented equities (Russell 1000 Value -4.8%) during the month. The Russell 1000 Value Index was negatively affected by larger allocations to Energy and Utilities companies, whose sectors returned -10.6% and -5.1%, respectively.
- Value stocks have continued to underperform in this equity cycle, down 3.7% per year relative to growth stocks over the past 10 years.

RELATIVE TRAILING PE RATIO OF U.S. VALUE VS. GROWTH



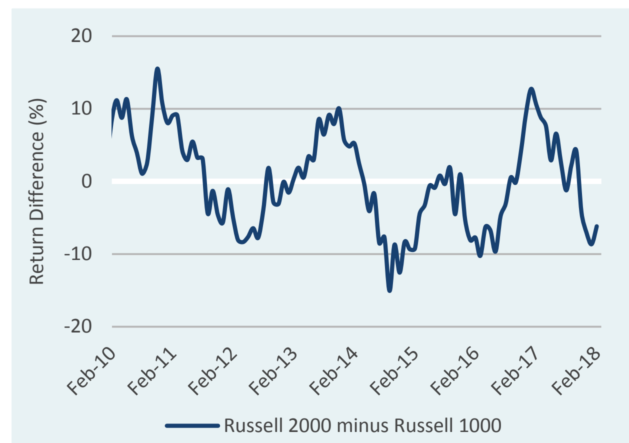
Source: Russell, Bloomberg, as of 2/28/18

U.S. VALUE VS. GROWTH RELATIVE PERFORMANCE



Source: Morningstar, as of 2/28/18

U.S. SMALL VS. LARGE 1-YEAR ROLLING RELATIVE PERFORMANCE



Source: FTSE, as of 2/28/18

Commodities

— The broad Bloomberg Commodity Index declined 1.7% in February. The energy and petroleum sub-sectors led the declines, returning -7.2% and -5.7%, respectively.

— WTI oil prices fell 4.8% to $61.64 per barrel, influenced by concerns over building U.S. shale production that has offset the decrease in supply from the OPEC cuts.

— The Bloomberg Energy sub-index was negatively affected by Natural Gas prices during the month (-11.0%). Unleaded Gasoline and Heating Oil also contributed to the decline, falling -7.8% and -7.5%, respectively.

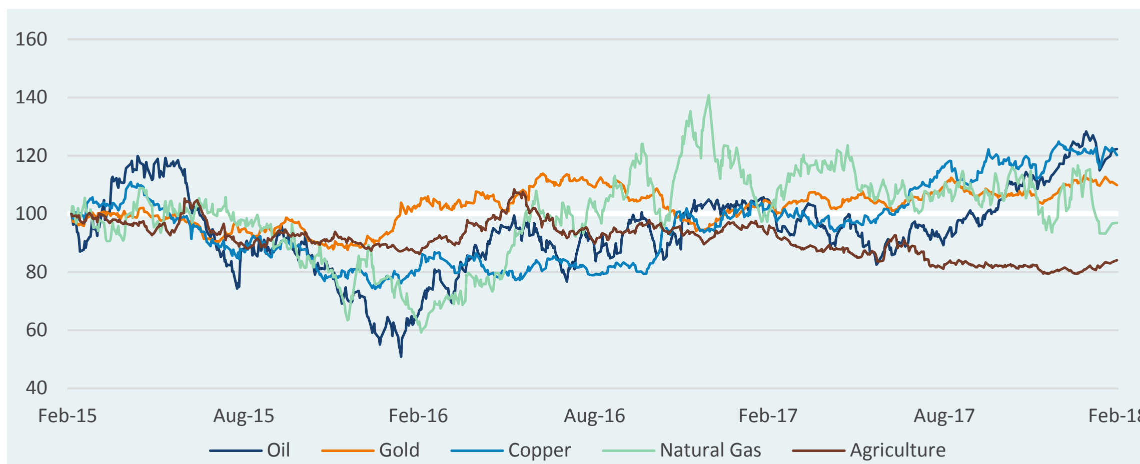
— The Bloomberg Grains sub-index had the best month of all the sub-indices, rising 5.1% in February. Wheat was the best performing asset within the sub-index, returning 9.6% during the month and 15.9% YTD.

INDEX AND SECTOR PERFORMANCE

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Bloomberg Commodity	(1.7)	0.2	0.2	1.6	(4.7)	(8.1)	(8.3)
Bloomberg Agriculture	4.7	6.1	6.1	(8.4)	(5.5)	(8.6)	(6.3)
Bloomberg Energy	(7.2)	(3.0)	(3.0)	3.3	(13.3)	(16.0)	(18.6)
Bloomberg Grains	5.1	9.7	9.7	(6.4)	(8.1)	(10.9)	(8.0)
Bloomberg Industrial Metals	(2.2)	(2.0)	(2.0)	15.4	5.1	(1.5)	(5.1)
Bloomberg Livestock	(1.9)	(3.2)	(3.2)	3.0	(4.0)	(2.0)	(5.6)
Bloomberg Petroleum	(5.7)	(1.3)	(1.3)	12.8	(9.2)	(14.6)	(12.6)
Bloomberg Precious Metals	(2.6)	(0.7)	(0.7)	(0.2)	1.2	(6.0)	1.2
Bloomberg Softs	1.5	(5.7)	(5.7)	(20.8)	(4.7)	(9.1)	(5.8)

Source: Morningstar, as of 2/28/18

COMMODITY PERFORMANCE



Source: Bloomberg, as of 2/28/18

Appendix

Periodic table of returns

BEST

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	YTD	5-Year	10-Year
Large Cap Growth	16.6	38.4	23.2	35.2	38.7	66.4	31.8	14.0	25.9	56.3	26.0	34.5	32.6	39.8	5.2	79.0	29.1	14.3	18.6	43.3	13.5	13.3	31.7	37.3	4.3	17.0	11.6
Emerging Markets Equity	8.1	37.8	23.1	32.9	27.0	43.1	22.8	8.4	10.3	48.5	22.2	21.4	26.9	16.2	1.4	37.2	26.9	7.8	18.1	38.8	13.2	5.7	21.3	30.2	3.3	14.6	10.7
Large Cap Equity	6.4	37.2	22.4	31.8	20.3	33.2	12.2	7.3	6.7	47.3	20.7	20.1	23.5	15.8	-6.5	34.5	24.5	2.6	17.9	34.5	13.0	0.9	17.3	25.0	1.6	13.7	9.8
Small Cap Growth	4.4	31.0	21.6	30.5	19.3	27.3	11.6	3.3	1.6	46.0	18.3	14.0	22.2	11.8	-21.4	32.5	19.2	1.5	17.5	33.5	11.8	0.6	12.1	22.2	0.9	12.2	9.7
60/40 Global Portfolio	3.2	28.5	21.4	22.4	16.2	26.5	7.0	2.8	1.0	39.2	16.5	7.5	18.4	11.6	-25.9	28.4	16.8	0.4	16.4	33.1	6.0	0.0	11.8	21.7	0.9	12.0	8.6
Hedge Funds of Funds	2.6	25.7	16.5	16.2	15.6	24.3	6.0	2.5	-5.9	30.0	14.5	7.1	16.6	10.9	-28.9	27.2	16.7	0.1	16.3	32.5	5.6	-0.4	11.3	17.1	0.7	10.6	7.9
International Equity	0.4	19.6	14.4	13.9	8.7	21.3	4.1	-2.4	-6.0	29.9	14.3	6.3	15.5	10.3	-33.8	23.3	16.1	-2.1	15.3	23.3	4.9	-0.8	11.2	14.6	0.3	10.2	6.1
Commodities	-1.5	18.5	11.3	12.9	4.9	20.9	-3.0	-5.6	-11.4	29.7	12.9	5.3	15.1	7.0	-35.6	20.6	15.5	-2.9	14.6	12.1	4.2	-1.4	8.0	13.7	0.2	7.1	4.7
Cash	-1.8	15.2	10.3	10.6	1.2	13.2	-7.3	-9.1	-15.5	25.2	11.4	4.7	13.3	7.0	-36.8	19.7	13.1	-4.2	11.5	11.0	3.4	-2.5	7.1	7.8	0.2	6.6	3.6
Real Estate	-2.0	11.6	9.9	9.7	-2.5	11.4	-7.8	-9.2	-15.7	23.9	9.1	4.6	10.4	5.8	-37.6	18.9	10.2	-5.5	10.5	9.0	2.8	-3.8	5.7	7.7	0.0	5.0	2.8
Large Cap Value	-2.4	11.1	6.4	5.2	-5.1	7.3	-14.0	-12.4	-20.5	11.6	6.9	4.6	9.1	4.4	-38.4	11.5	8.2	-5.7	4.8	0.1	0.0	-4.4	2.6	5.1	-1.1	3.7	2.7
Small Cap Equity	-2.9	7.5	6.0	2.1	-6.5	4.8	-22.4	-19.5	-21.7	9.0	6.3	4.2	4.8	-0.2	-38.5	5.9	6.5	-11.7	4.2	-2.0	-1.8	-7.5	1.0	3.5	-1.4	1.7	1.3
US Bonds	-3.5	5.7	5.1	-3.4	-25.3	-0.8	-22.4	-20.4	-27.9	4.1	4.3	3.2	4.3	-1.6	-43.1	0.2	5.7	-13.3	0.1	-2.3	-4.5	-14.9	0.5	1.7	-2.1	0.3	0.3
Small Cap Value	-7.3	-5.2	3.6	-11.6	-27.0	-1.5	-30.6	-21.2	-30.3	1.0	1.4	2.4	2.1	-9.8	-53.2	-16.9	0.1	-18.2	-1.1	-9.5	-17.0	-24.7	0.3	0.9	-3.8	-8.1	-8.3

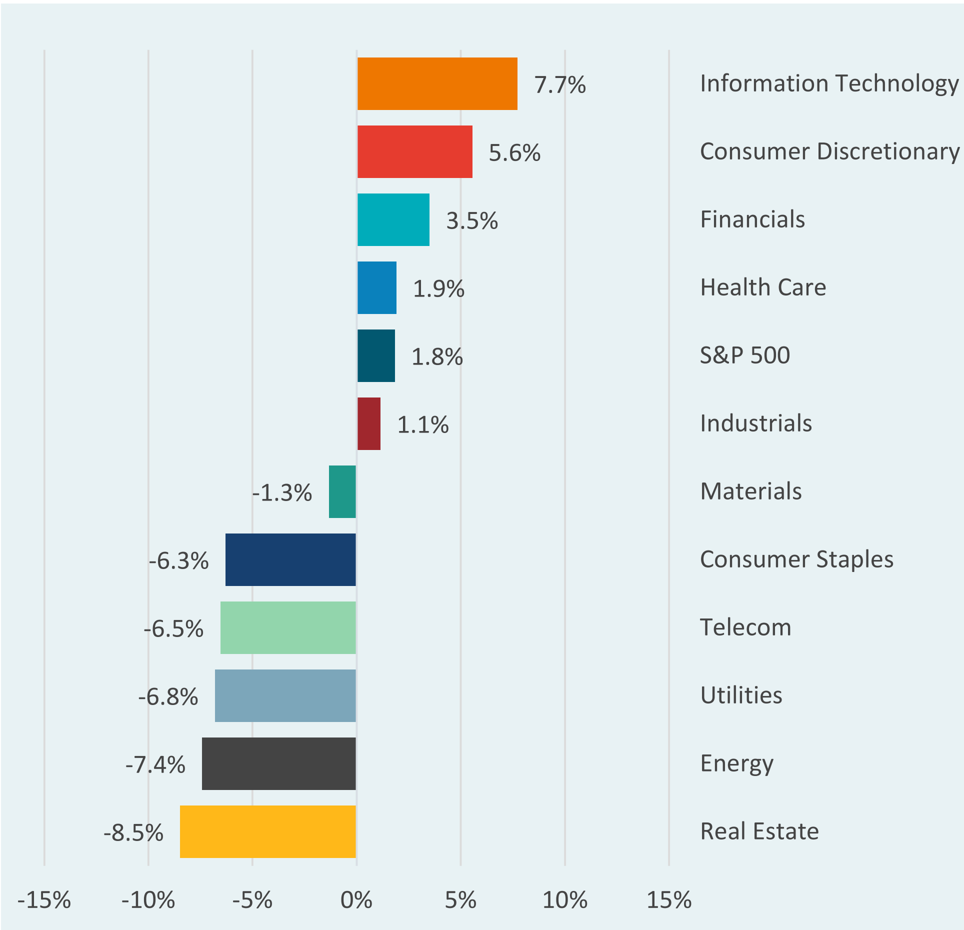
WORST

- Large Cap Equity
- Large Cap Value
- Large Cap Growth
- Small Cap Equity
- Small Cap Value
- Small Cap Growth
- International Equity
- Emerging Markets Equity
- US Bonds
- Cash
- Commodities
- Real Estate
- Hedge Funds of Funds
- 60% MSCI ACWI/40% BBgBarc Global Bond

Source Data: Morningstar, Inc., Hedge Fund Research, Inc. (HFR), National Council of Real Estate Investment Fiduciaries (NCREIF). Indices used: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EM, BBgBarc US Aggregate, T-Bill 90 Day, Bloomberg Commodity, NCREIF Property, HFRI FOF, MSCI ACWI, BBgBarc Global Bond. NCREIF Property Index performance data as of 12/31/17.

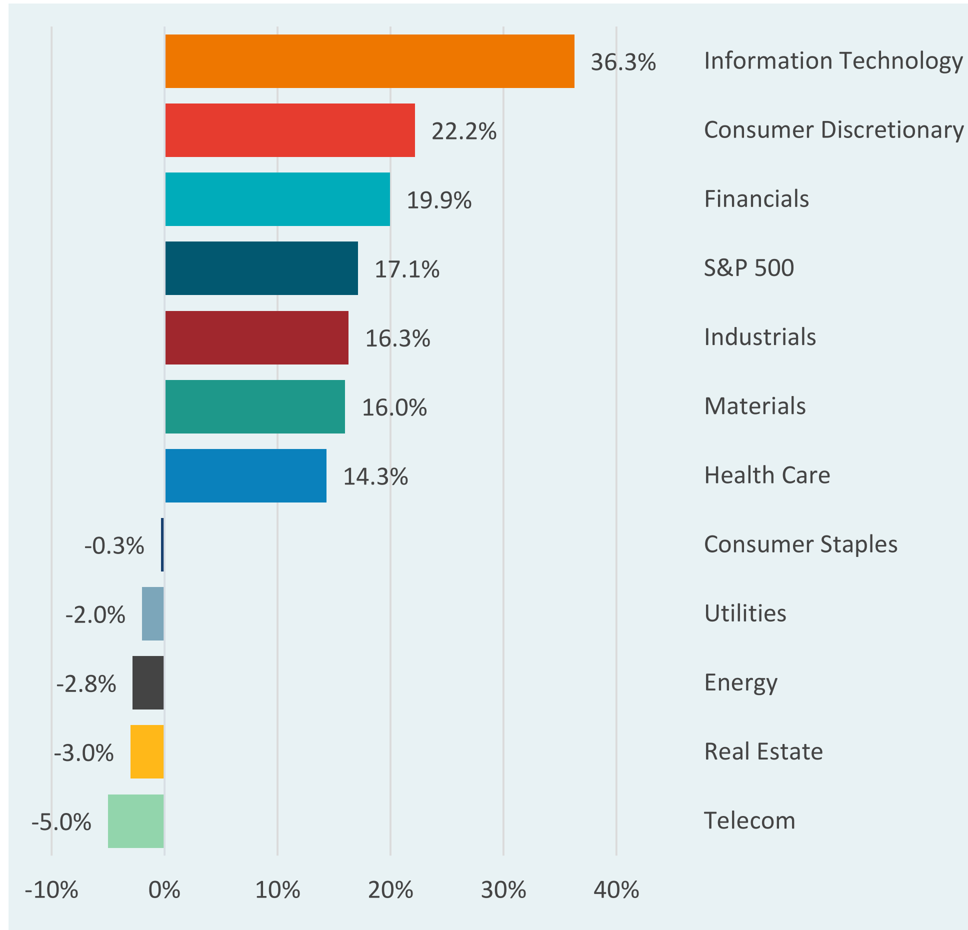
S&P 500 sector returns

QTD



Source: Morningstar, as of 2/28/18

ONE YEAR ENDING FEBRUARY



Source: Morningstar, as of 2/28/18

Detailed index returns

DOMESTIC EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Core Index							
S&P 500	(3.7)	1.8	1.8	17.1	11.1	14.7	9.7
S&P 500 Equal Weighted	(4.3)	(0.1)	(0.1)	12.7	9.1	14.0	11.0
DJ Industrial Average	(4.0)	1.7	1.7	23.1	14.2	15.0	10.3
Russell Top 200	(3.5)	2.4	2.4	18.6	11.9	15.2	9.7
Russell 1000	(3.7)	1.6	1.6	16.7	10.8	14.6	9.8
Russell 2000	(3.9)	(1.4)	(1.4)	10.5	8.5	12.2	9.7
Russell 3000	(3.7)	1.4	1.4	16.2	10.6	14.4	9.8
Russell Mid Cap	(4.1)	(0.5)	(0.5)	12.0	8.0	13.0	10.0
Style Index							
Russell 1000 Growth	(2.6)	4.3	4.3	26.1	13.5	17.0	11.6
Russell 1000 Value	(4.8)	(1.1)	(1.1)	7.8	8.0	12.0	7.9
Russell 2000 Growth	(2.8)	0.9	0.9	18.4	8.9	13.7	10.7
Russell 2000 Value	(5.0)	(3.8)	(3.8)	3.0	8.0	10.6	8.6

FIXED INCOME

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
BBgBarc US Treasury US TIPS	(1.0)	(1.8)	(1.8)	(0.2)	0.8	(0.1)	2.8
BBgBarc US Treasury Bills	0.1	0.2	0.2	0.9	0.5	0.3	0.4
BBgBarc US Agg Bond	(0.9)	(2.1)	(2.1)	0.5	1.1	1.7	3.6
Duration							
BBgBarc US Treasury 1-3 Yr	(0.0)	(0.4)	(0.4)	(0.2)	0.4	0.5	1.1
BBgBarc US Treasury Long	(3.0)	(6.1)	(6.1)	(0.1)	(0.3)	2.7	5.6
BBgBarc US Treasury	(0.8)	(2.1)	(2.1)	(0.6)	0.3	0.9	2.7
Issuer							
BBgBarc US MBS	(0.7)	(1.8)	(1.8)	0.2	1.0	1.7	3.5
BBgBarc US Corp. High Yield	(0.8)	(0.3)	(0.3)	4.2	5.2	5.3	8.3
BBgBarc US Agency Interm	(0.2)	(0.6)	(0.6)	0.0	0.7	0.8	2.2
BBgBarc US Credit	(1.5)	(2.4)	(2.4)	2.1	2.2	2.8	5.0

INTERNATIONAL EQUITY

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Broad Index							
MSCI ACWI	(4.2)	1.2	1.2	18.8	8.3	10.1	5.6
MSCI ACWI ex US	(4.7)	0.6	0.6	21.6	6.2	6.3	2.7
MSCI EAFE	(4.5)	0.3	0.3	20.1	5.7	7.1	2.8
MSCI EM	(4.6)	3.3	3.3	30.5	9.0	5.0	2.7
MSCI EAFE Small Cap	(3.5)	1.4	1.4	27.4	12.3	11.8	6.6
Style Index							
MSCI EAFE Growth	(4.3)	0.2	0.2	22.2	6.8	7.7	3.4
MSCI EAFE Value	(4.8)	0.4	0.4	18.2	4.5	6.3	2.2
Regional Index							
MSCI UK	(6.4)	(3.5)	(3.5)	14.2	1.2	4.2	2.1
MSCI Japan	(1.5)	3.0	3.0	21.8	9.7	10.4	3.9
MSCI Euro	(6.0)	0.8	0.8	24.8	5.6	8.0	1.0
MSCI EM Asia	(5.4)	2.2	2.2	33.1	10.1	8.2	4.7
MSCI EM Latin American	(3.6)	9.1	9.1	21.1	7.7	(1.7)	(1.0)

OTHER

	Month	QTD	YTD	1 Year	3 Year	5 Year	10 Year
Index							
Bloomberg Commodity	(1.7)	0.2	0.2	1.6	(4.7)	(8.1)	(8.3)
Wilshire US REIT	(7.6)	(11.1)	(11.1)	(10.0)	0.2	5.9	6.5
CS Leveraged Loans	0.2	1.3	1.3	4.4	4.4	4.3	5.3
Regional Index							
JPM EMBI Global Div	(2.0)	(2.0)	(2.0)	4.4	5.8	4.5	7.0
JPM GBI-EM Global Div	(1.0)	3.4	3.4	14.4	4.0	(1.0)	3.6
Hedge Funds							
HFRI Composite	(1.8)	0.5	0.5	6.9	3.8	4.5	3.4
HFRI FOF Composite	(1.6)	0.7	0.7	6.5	2.2	3.7	1.3
Currency (Spot)							
Euro	(2.1)	1.6	1.6	14.8	2.8	(1.4)	(2.2)
Pound	(3.1)	1.9	1.9	10.7	(3.8)	(1.9)	(3.6)
Yen	2.3	5.6	5.6	4.9	3.9	(2.9)	(0.2)

Source: Morningstar, as of 2/28/18

Definitions

ISM Manufacturing Index – *based on data compiled from purchasing and supply executives nationwide. Survey responses reflect the change, if any, in the current month compared to the previous month. For each of the indicators measured (New Orders, Backlog of Orders, New Export Orders, Imports, Production, Supplier Deliveries, Inventories, Customers' Inventories, Employment and Prices), this report shows the percentage reporting each response, the net difference between the number of responses in the positive economic direction and the negative economic direction, and the diffusion index. Beginning in January 2018, computation of the indexes is accomplished utilizing unrounded numbers. (www.instituteforsupplymanagement.org)*

Markit Euro Manufacturing Index – *The Eurozone PMI (Purchasing Managers' Index) is produced by IHS Markit and is based on original survey data collected from a representative panel of around 5,000 companies based in the euro area manufacturing and service sectors. National manufacturing data are included for Germany, France, Italy, Spain, the Netherlands, Austria, the Republic of Ireland and Greece. National services data are included for Germany, France, Italy, Spain and the Republic of Ireland. The flash estimate is typically based on approximately 85%–90% of total PMI survey responses each month and is designed to provide an accurate advance indication of the final PMI data.*

Conference Board Consumer Confidence *- The Consumer Confidence Survey® reflects prevailing business conditions and likely developments for the months ahead. This monthly report details consumer attitudes and buying intentions, with data available by age, income, and region. (https://www.conference-board.org/data/consumerconfidence.cfm)*

National Association of Realtors' Pending Homes Sales Index*- The Pending Home Sales Index (PHS), a leading indicator of housing activity, measures housing contract activity, and is based on signed real estate contracts for existing single-family homes, condos, and co-ops. Because a home goes under contract a month or two before it is sold, the Pending Home Sales Index generally leads Existing-Home Sales by a month or two. NAR now collects pending home sales data from MLSs and large brokers. Altogether, we receive data from over 100 MLSs & 60 large brokers, giving us a large sample size covering 50% of the EHS sample. This is equal to 20 percent of all transactions. (https://www.nar.realtor/research-and-statistics/housing-statistics/pending-home-sales/methodology)*

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Date: March 26, 2018

To: Board of Trustees

From: Carl Nelson – Executive Secretary
Amy Burke – Deputy Executive Secretary

Agenda Item 11: Asset Allocation March 2018

This item on the agenda provides a properly noticed opportunity for the Board of Trustees to discuss and take action if necessary regarding asset allocation and related investment matters.

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