EMPLOYEES RETIREMENT SYSTEM OF TEXAS
JOINT MEETING OF THE BOARD OF TRUSTEES AND INVESTMENT ADVISORY COMMITTEE
ERS Building – Board Room
200 E. 18th Street, Austin, Texas 78701
December 1 - 2, 2016 – 8:00 a.m.

Joint Meeting of the ERS Board of Trustees and Investment Advisory Committee

1. Review and Approval of the Minutes to the August 16, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee

2. Review and Discussion of ERS' Asset Allocation Study:
   a. Featured Speaker Michael Hood on Asset Allocation
   b. Presentation of Risk Survey Results
   c. Capital Market Assumptions

3.* Discussion and Training Regarding Ethics and Fiduciary Responsibility

4.* Review and Discussion of ERS Retirement Plans and Actuarial Valuation Reports for Funding as of August 31, 2016

5.* Review and Discussion of the Investment Performance of the System's Assets:
   a. Fiscal Year 2016 Investment Performance
   b. Fiscal Year 2016 Global Investment Performance Standards Report
   c. Third Calendar Quarter of 2016 Investment Performance

6.* Review and Discussion of the Risk Management and Applied Research Program

7. Review, Discussion and Consideration of ERS' Emerging Manager Program

8. Chief Investment Officer's Report

9. **ADJOURNMENT OF THE JOINT MEETING OF THE BOARD OF TRUSTEES AND THE INVESTMENT ADVISORY COMMITTEE AND RECESS OF THE BOARD OF TRUSTEES** – The Board of Trustees will reconvene as a Committee of the whole on Friday, December 2, 2016 at 8:00 a.m. to consider Audit and Board agenda items.

Meeting of the ERS Board of Trustees Audit Committee

10. Review and Approval of the Minutes to the August 16, 2016 ERS Audit Committee Meeting

11. Presentation, Discussion and Consideration of Audit Committee Agenda Items:
   a. Internal Audit Reports
   b. Internal Audit Administrative Items

12. **ADJOURNMENT OF THE ERS BOARD OF TRUSTEES AUDIT COMMITTEE** – Following adjournment of the ERS Audit Committee, the Board of Trustees will take up the remaining agenda items.

Meeting of the ERS Board of Trustees

13. Review and Approval of the Minutes to the August 16, 2016 meeting of the Board of Trustees

14. Executive Session – In accordance with section 551.074, Texas Government Code, the Board of Trustees will meet in executive session to evaluate the duties, performance and compensation of the Internal Auditor of the Employees Retirement System of Texas. Thereafter the Board may consider appropriate action in open session.

15. Review, Discussion and Selection of the Third-Party Administrator for HealthSelect[SM] of Texas, Including Consumer Directed HealthSelect[SM]

16. Review and Discussion of the Deferred Compensation Program Texa$aver 401(k) and 457 Plans and Monitoring Strategy Overview

17. Review, Discussion and Consideration of the Texas Employees Group Benefits Program:
    a. Health Insurance Financial Status Update for Fiscal Year 2016 and Outlook for Fiscal Year 2017
    b. GBP Medicare Plans and Monitoring Strategy Overview
    c. Dental Insurance Plans and Monitoring Strategy Overview
    d. Basic and Optional Term Life, Accidental Death and Dismemberment Plans Monitoring Strategy Overview
    e. Group Vision Care Program and Monitoring Strategy Overview
    f. Disability Plans and Monitoring Strategy Overview

18. Review and Discussion of the Texas Employees Group Benefits Program: TexFlex Program and Monitoring Strategy Overview

19. Review, Discussion and Consideration of the Texas Employees Group Benefits Program: Actuarial Valuation of Retiree Health Insurance Benefits as of August 31, 2016

20. Review, Discussion and Consideration of Reappointment of ERS Investment Advisory Committee Member with Term Expiring December 31, 2016

21. Executive Director Agency Update

22. Set 2017 Meeting Dates for the Joint Meeting of the ERS Board of Trustees and Investment Advisory Committee, the Meeting of the Board of Trustees, and the Meeting of the Audit Committee

23. Executive Session – In accordance with Section 551.072, Texas Government Code, the Board of Trustees will meet in executive session to deliberate the purchase, exchange, lease or value of real property and the ERS building. Thereafter, the Board may consider appropriate action in open session.

24. ADJOURNMENT OF THE BOARD OF TRUSTEES

** We are accredited by the State Pension Review Board (PRB) as a Minimum Educational Training (MET) sponsor for Texas public retirement systems. This accreditation does not constitute an endorsement by the PRB as to the quality of our MET program. These agenda items may be considered in-house training provided by ERS to board trustees and the system administrator for purposes of fulfilling the MET program requirements. ERS is an accredited sponsor of MET for its system administrator and trustees.*

NOTES: 1. Persons with disabilities who plan to attend this meeting and who may need special assistance are requested to contact Kelley Davenport at (512) 867-7772 three to five (3-5) working days prior to the meeting date so that appropriate arrangements can be made.

2. The Employees Retirement System of Texas Joint Meeting of the Board of Trustees and Investment Advisory Committee is scheduled to meet from 8:00 a.m. to approximately 4:45 p.m. on Thursday, December 1, 2016. The Board of Trustees will convene as a committee of the whole on Friday, December 2, 2016 to take up Audit and Board agenda items from approximately 8:00 a.m. to 4:00 p.m. but may hear those items before or after the anticipated time frame. Meetings are tentatively scheduled to follow each other consecutively, but they may start earlier or later than the posted time depending on the length of the discussions within each agenda item and meeting and other circumstances not presently anticipated. Please note that the estimated times and sequence of agenda items are only approximate, and the time reflected in the posted agenda item, order of meetings or agenda items may be moved or adjusted as necessary.

PUBLIC AGENDA ITEM - #1

1. Review and Approval of the Minutes to the August 16, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee

December 1, 2016

BACKGROUND:

Attached under separate cover, are the minutes to the August 16, 2016 Joint Meeting of the Board of Trustees (Board) and Investment Advisory Committee (IAC). These minutes are submitted to the IAC and Board for review and, if no amendments, are recommended for approval.

PROPOSED MOTIONS:

The ERS staff recommends the following motion to the **Investment Advisory Committee**:

> I move that the Investment Advisory Committee of the Employees Retirement System of Texas approve the minutes to its Joint Meeting with the Board of Trustees held on August 16, 2016.

Contingent upon adoption of the above motion by the IAC, staff recommends the following motion to the **Board of Trustees**:

> I move that the Board of Trustees of the Employees Retirement System of Texas approve the minutes to its Joint Meeting with the Investment Advisory Committee held on August 16, 2016.

ATTACHMENT – 1

Exhibit A – Minutes of the August 16, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee

Joint Meeting of the Investment Advisory Committee and Board of Trustees

ERS
Employees Retirement System of Texas

Presented for Review and Approval
December 1, 2016

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EMPLOYEES RETIREMENT SYSTEM OF TEXAS
JOINT MEETING OF THE BOARD OF TRUSTEES AND INVESTMENT ADVISORY COMMITTEE
ERS Building – Board Room
200 E. 18th Street, Austin, Texas 78701
August 16, 2016 – 8:00 a.m.

COMMITTEE MEMBERS PRESENT
James "Jim" R. Hille, Chair
Caroline Cooley, Vice-Chair
Robert "Bob" G. Alley, Member
Vernon D. Torgerson, Jr., Member

COMMITTEE MEMBERS ABSENT
Ken D. Mindell, Member
Laura T. Starks, Member
Lenore M. Sullivan, Member

TRUSTEES PRESENT
I. Craig Hester, Chair
Doug Danzeiser, Vice-Chair
Ilesa Daniels, Member
Cydney Donnell, Member
Brian D. Ragland, Member
Jeanie Wyatt, Member

ERS STAFF PRESENT
Porter Wilson, Executive Director
Tom Tull, Chief Investment Officer
Catherine Terrell, Deputy Executive Director
Paula Jones, Deputy Executive Director and General Counsel
Kathryn Tesar, Director of Benefits Communications
Tony Chavez, Director of Internal Audit
Machelle Pharr, Chief Financial Officer
DeeDee Sterns, Director of Human Resource
Sharmila "Shar" Kassam, Deputy Chief Investment Officer
Kelley Davenport, Executive Office
Brittany B. Hornsey, Investments
Tanna Ridgway, Investments
Elizabeth "Liz" Geise, Benefits Communications
Roger Nooner, Benefits Communications
Christi Davis, Customer Benefits
Beth Gilbert, Internal Audit
Keith Yawn, Enterprise Planning Office
Chuck Turner, Information Systems
Tommy Williams, Information Systems
Robin Hardaway, Customer Benefits
Nicholas "Nick" Maffeo, Investments
Davis Peacock, Investments
Ricardo Lyra, Investments
Panayiotis Lambropoulos, Investments
Pablo de la Sierra Perez, Investments
Wes Gipson, Investments
Adriana Ballard, Investments
Robert Lee, Investments
Anthony Curtiss, Investments

Leighton A. Shantz, Investments
Jonathan Puckett, Internal Audit
Betty Martin, Investments
Robert "Bob" Sessa, Investments
Brannon Andrews, Legal
Cheryl Scott Ryan, Legal
Carlos Chujoy, Investments
Satitpong Chantarajirawong, Investments
Leah Erard, Governmental Affairs
Peter Ehret, Investments
Jennifer Jones, Governmental Affairs
Amanda Burleigh, Legal

VISITORS PRESENT
Andrew Clark, Speaker's Office
Keith Barowes, Blue Cross Blue Shield of Texas
Yves-Laurent Khoury, Blue Cross Blue Shield of Texas
James Walsh, Albourne America
Gabriel Puente, Strategic Partnerships, Inc.
Steve Von, AON Hewitt
Kristen Doyle, AON Hewitt
Karen K. Wilson, Northrop Grumman
Bradford Young, Altius Associates
William "Billy" Charlton, Altius Associates
Chason Beggerow, Altius Associates
Malika Te, House Appropriations Committee
Brittany McCollum, Caremark
Kris Hefingr, Caremark
John Hryhorchuk, Office of the Governor
Chris Cook, AAG Empower
Darryl Collier, AAG Empower
Peter Ossian AAG Empower
Brad Untiedt, AAG Empower
Bill Thornton, AAG Empower

Mr. Jim Hille, Chair of the Investment Advisory Committee (IAC) for the Employees Retirement System of Texas (ERS), called the meeting to order and read the following statement:

> "A public notice of the Joint Meeting of the Board of Trustees and Investment Advisory Committee containing all items in the proposed agenda was filed with the Office of the Secretary of State at 10:56 a.m. on Thursday, August 4, 2016, as required by Chapter 551, Texas Government Code, referred to as the Open Meetings law."

Mr. Craig Hester, Chair of the Board of Trustees (Board) and Investment Advisory Committee for the Employees Retirement System of Texas (ERS), also read the following statement:

> "A public notice of the Joint Meeting of the Board of Trustees and Investment Advisory Committee containing all items in the proposed agenda was filed with the Office of the Secretary of State at 10:56 a.m. on Thursday, August 4, 2016, as required by Chapter 551, Texas Government Code, referred to as the Open Meetings law."

V. REVIEW AND APPROVAL OF THE MINUTES TO THE MAY 17, 2016 JOINT MEETING OF THE BOARD OF TRUSTEES AND INVESTMENT ADVISORY COMMITTEE

Ms. Cydney Donnell, IAC Member, noted she was in attendance at the May 17, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee, a correction will be made to the minutes to reflect her attendance.

The Investment Advisory Committee then took the following action:

> **MOTION** made by Mr. Bob Alley, seconded by Mr. Vernon D. Torgerson, Jr., and carried unanimously by the members present that the Investment Advisory Committee approved the amended minutes of the May 17, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee.

The Board of Trustees then took the following action:

> **MOTION** made by Mr. Brian Ragland, seconded by Mr. Doug Danzeiser, and carried unanimously by the members present that the Board of Trustees approved the amended minutes of the May 17, 2016 Joint Meeting of the Board of Trustees and Investment Advisory Committee.

VI. REVIEW AND DISCUSSION OF THE INVESTMENT PERFORMANCE FOR SECOND CALENDAR QUARTER 2016

Ms. Sharmila Kassam, Deputy Chief Investment Officer, Mr. Steve Voss and Ms. Kristen Doyle, Consultants from Aon Hewitt Investment Consulting, presented the review and discussion of the investment performance for the second calendar quarter of 2016.

Ms. Kassam reminded the Board that staff and consultants will continue to clarify and define industry terminology and language throughout the discussion, particularly in the investment section. Ms. Doyle began the presentation of the Fund's performance. Ms. Doyle gave a brief performance snapshot of the Trust fund as of June 30, 2016. She mentioned that the performance has been positive in terms of absolute return. The performance for the total fund for the calendar year to date was up 1.7% compared to the benchmark of 2.8%, and the fiscal year to date total fund performance was up 2.2% compared to the benchmark of 3.7%. Ms. Doyle explained that relative return has been challenged.

Ms. Doyle presented the Asset Allocation total fund as of June 30, 2016. During this fiscal year, $755.9 million was deducted from the Fund through new additions/withdrawals and $263 million in investment earning was added. The Trust started the fiscal year at approximately $25.2 billion and ended the period with a market value of $24.7 billion. During this quarter, $212 million was deducted from the Fund through new additions/withdrawals and $126.6 million in investment earnings was added. The Trust started the quarter at approximately $24.8 billion and ended the period with a market value of $24.7 billion due to the outflows that that have been reported.

Ms. Doyle presented the attribution analysis of the Total Fund, the Total Fund Policy Benchmark, and the Long Term Public Benchmark. During the second quarter, the Total Fund performed in line with the Total Fund Policy Benchmark. For the quarter, the private equity, real assets, rates, and absolute return components contributed positive relative value. The public equity component detracted from relative performance during the period. The Total Fund underperformed the Total Fund Policy Benchmark by 146 basis points (bps) for the one-year period.

Mr. John Streun, Director of Public Equities, joined the presentation to answer questions regarding the positioning of the public equities portfolio.

During the 12-month period, the Trust has seen a lot of volatility, especially in the public equity markets, specifically the energy sector. Ms. Doyle indicated the Trust Fund absolute returns remain flat or

median in comparison to large universe public pension funds only showing the Trust Fund down 20 bps for the median return for public pension funds over a billion dollars in size.

As to performance over the longer ten-year horizon, the return of the total Trust Fund shows 40 bps of outperformance relative to the Trust Fund Policy Benchmark and 100 bps of outperformance over the Long Term Public Benchmark[1].

Ms. Doyle discussed the performance of the asset classes. Actual allocations continue to be in line with the strategic targets and are substantially on their way to the long-term policy targets. Active management in public equities has shown underperformance from both internally managed portfolios as well as externally managed portfolios. Over the trailing 12-months ending December 2015, the S&P 1500 outperformed 75% of the managers in the active management universe.

The Total Fund asset allocation effect, representing the impact of actual allocation deviations from the policy targets on the Total Fund's relative performance, underperformed by 37 bps for the one-year period. This attribution is driven by the third quarter of 2015, where the Trust experienced negative global equity returns, and strong bond returns. The Trust was overweight in global equities and underweight to REITs.

Mr. Hille commented that now is the time to show if the discipline used will work and expressed his confidence in staff. Mr. Hille asked how the active return of the Total Fund benchmark of 8% is expected to be achieved long-term. Mr. Hille also asked what the inflation rate assumption is currently.

Mr. Voss answered the Aon's current inflation rate forward-looking assumption is 2.1%. Ms. Doyle noted the inflation rate modeled into the current asset allocation was determined to be 3% as of the last study. Ms. Doyle explained the Trust Fund has outperformed at a lower level of risk when looking at the five-year and the ten-year horizons. The Trust Fund is outperforming at a lower level of risk over both of these time periods in comparison to the long-term public benchmark, which is 79% MSCI All Country Worlds, and 21% the U.S. bond market.

Mr. Voss noted the last asset liability study was conducted in 2012 and at that time the Investment Program benchmark was 7.5% with a ten-year expected future return. Moving forward, the consultants are working with staff to look at a process to incorporate long-term expected performance returns of asset classes such as the mix between all stocks, bonds, real estate, private equity, and absolute return strategies.

Ms. Shar Kassam also responded to Mr. Hille that there will be discussions at the December workshop in terms of return expectations and assumptions to set the stage for the calendar year 2017 Asset Allocation and Liability Study.

Ms. Doyle discussed the rolling 10-year returns of the Fund explaining how the Trust generated a return in excess of the 8% in historical context from 2012 to last year. However, due to the most recent underperformance we have seen a decline. The overall trend has been more tracking error and better risk adjusted returns based on the asset allocation change from the middle of 2013 to date. Private equity, absolute return, real estate, real assets, and fixed income play a larger part of the portfolio relative to global equities.

Ms. Doyle continued to discuss the longer term returns and recommended focusing on diversifying lower risk (volatility) strategies to manage the overall risk of the Trust Fund. Longer term investment results have been positive and the Total Fund has produced nominal and risk adjusted returns superior to the benchmark and the Long Term Public benchmark over the five-year and ten-year period.

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[1] The Long Term Public Benchmark is a combination of 79% MSCI ACW IMI and 21% Barclays Intermediate Treasury Index.

Mr. Voss summarized the overall Trust Fund performance of the 12-month period. The public equity underperformance has been the largest detractor from Total Fund results. He recommended diversification opportunities as ERS goes through the Asset Allocation Study throughout the next year.

Ms. Kassam concluded the presentation explaining that staff is actively seeking external advisors such as international small cap and international managers that can work evenly with active management.

There was no further discussion, and no action was required on this item.

VII. REVIEW, DISCUSSION AND CONSIDERATION OF THE ERS PRIVATE EQUITY PROGRAM:

a. Market Update and Program Overview - Mr. Wesley Gipson, Director of Private Equity and Infrastructure, Mr. Davis Peacock, Private Equity Portfolio Manager, and Mr. Ricardo Lyra, Private Equity Portfolio Manager of ERS, and Mr. Brad Young, Mr. Billy Charlton, and Mr. Chason Beggerow, Altius Associates, presented the review and discussion of the Private Equity portfolio, giving an overview, a review of the diversification metrics and detailed performance metrics.

Mr. Gipson introduced the Private Equity and Infrastructure. The Private Equity and Infrastructure Team consists of Mr. Pablo de la Sierra Perez, Assistant Director of Infrastructure, Mr. Ricardo Lyra, Private Equity Portfolio Manager, who joined us recently in January, Mr. Davis Peacock who was recently promoted to Private Equity Portfolio Manager, and Ms. Adriana Ballard, Analyst, who joined us last year.

Mr. Gipson presented the performance overview of the Private Equity and Infrastructure Team as it currently stands from inception through June 30, 2016. Since inception through the end of June 2016, Private Equity committed $6.2 billion. Fiscal year to date, Private Equity committed $744 million. Since inception through the end of June 2016, Private Equity's total called committed was $4 billion. Since inception through the end of June 2016, Private Equity's total distributions were $2.5 billion, including $1.1 billion of distributions over the current fiscal year. The $1.1 billion of distributions includes a secondary sale. The net asset value (NAV) is down $217 million from fiscal year 2015 totaling $2.5 billion. The Private Equity Program exceeded the 10% target, currently totaling 10.3% of the Trust.

Mr. Gipson defined total value to paid in capital (TVPI) as distributions received plus our current NAV divided by all of our cash sent out into the investments. The TVPI currently stands unchanged at under 1.3 times. He defines distributions to paid in capital (DPI) as cash received divided by cash sent out. The total DPI is 0.64 times the as a result of both distributions and a secondary sale. Private Equity's internal rate of return (IRR) is at 10.9%, which is down 106 bps than fiscal year 2015.

Mr. Gipson presented an overview of the pro forma portfolio diversification by sector as of March 31, 2016. Please note the June 30, 2016 valuations are based on the March 31, 2016 portfolio company data, so the pro forma presentation takes into account eliminating those interests that were sold as part of our secondary sale. The target strategy diversification is based on broad ranges. These ranges are being compared to our NAV, defined as the economic exposure, plus all uncalled capital allocated commitments to these strategies. The target strategy diversification is 56.5% and the NAV by strategy current total is 45.4%. This is the result of selling a billion dollars in buyout exposure. The secondary sale was purely buyout. The economic exposure, also impacted by the secondary sale, represented 36.4% of total economic exposure. The Private Equity team is now focused on rebuilding the buyout portfolio moving forward.

Mr. Gipson discussed the pro forma portfolio diversification by geography. The geography guideline is 50% United States and 50% International (50/50). The 50% International is considered a cap (not to exceed) versus a guideline. The current NAV total by geography is 65% United States, 17% Europe, 15% Asia, and 3% Latin America. Notable here, Europe and Asia are not usually this close. The economic exposure total is 60% United States, 21% Europe, 15% Asia, and 3% Latin America. There was a lot of Europe sold in the secondary sale. Mr. Gipson noted he also expects both NAV and

economic exposure performance totals to be short term and more aligned with historical levels of Europe being about 10 points of exposure over Asia.

Mr. Gipson reported the pro forma portfolio diversification by sector as of March 31, 2016. He reminded the Board the diversified category is currently the largest portion of the portfolio due to the highly diversified secondary funds as well as credit exposure. Unchanged from last year, diversified secondary's (17.9%) is identified as the largest sector, followed by industrials (17.8%), financials (14.3%), information technology (13.1%), energy (11.2%), consumer discretionary (10.3%), healthcare (8%), materials (3.9%), consumer staples (2.4%), utilities (0.8%), and telecommunication services (0.2%).

Mr. Gipson presented the portfolio diversification by vintage year performance based on current exposure, not historical commitments. Therefore, all commitments that were sold with the secondary sale are not represented in the portfolio diversification by vintage year. The 2016 total commitments are $733 million with a total net asset value of $113 million. So with roughly a billion of total exposures sold, the top of these years is a bit lower than what is actually committed, at the time. The year 2016 remains consistent with 2009 ($452 million commitments with a net asset value of $252 million), 2008 ($74 million commitments with a net asset value of $50 million), and 2007 ($121 million commitments with a net asset value of $49 million). The year 2007 was not a commitment year. 2008 was represented in the secondary sale, as well as the years 2009, 2010, 2011, and 2012.

Mr. Vernon D. Torgerson, Jr. asked how distributions are shown on the charts?

Mr. Gipson explained that distributions are not in this chart. The charts shown include the current commitments that are still active made in that fiscal year. He continued explaining that every year is fairly consistent with the exception of 2014 ($1,393 million commitment with a net asset value of $617 million) due to two of our large mandates. These mandates crossed fiscal years, following the same vintage year. One was a secondary mandate and the other an Asian fund mandate, which makes it appear larger relative to the rest of the vintage years. Without the crossover in 2014, we would have only seen a $700 million range.

Mr. Gipson presented the portfolio diversification by general partner with fund NAVs as of June 30, 2016 and valuations as of March 31, 2016. The economic exposure by general partner is less than 10%. The total of our top ten general partners is under 60%.

Mr. Peacock discussed the Private Equity Program portfolio performance. He presented a chart that showed an accounting of the cash flows and the J curve effect of the portfolio since inception on a quarter by quarter basis. The J-curve effect is a representation of an early stage on investments where costs exceed returns and only shows the internal rate of return (IRR). He explained the fourth quarter of 2011 was the peak amount representing 11%. The average net call as a percentage of the remaining uncalled committed capital has been 3.6% since inception. Mr. Peacock also noted that the second quarter of 2016 is high performing due to the secondary sale.

Mr. Peacock presented a chart of the portfolio value creation since inception. The chart showed total capital called to the current net asset value of the portfolio. The total capital invested was $3.8 billion. The total fees are $202 million in capital called. The return of capital and gains in the portfolio totals are $2.5 billion. The current capital at risk is $1.5 billion, which is 36% of total invested capital. The total portfolio NAV is $2.5 billion. The portfolio value creation is approximately $1 billion, which is 41% of the current NAV.

Mr. Peacock presented a chart that showed the performance of the portfolio on an investment by investment basis by strategy as of June 30, 2016. This chart is broken out between buyouts, growth equity, venture capital, special situations, credit and co-investments. The horizontal axis shown is the IRR since inception and the vertical axis is the total value paid in capital multiple. He pointed out the co-investment performance is located in the center of the axis showing that we have several co-investments that are grouped around the slightly negative territory. The majority of these are early in the investment period. The negative co-investment performance is due to various costs or fees that may have been

associated with completing the transaction. Two of the five co-investments that are shown further in negative territory are directly tied to the oil and gas industry, while one is related to commodity prices. Mr. Peacock discussed the top four multiple co-investments represented as realized or partially realized co-investments in the portfolio. The total combined multiple of those four companies is 3.1 times.

Mr. Hester asked what our total co-investment exposure is on the two co-investments that are underperforming. He followed up by asking if we could lose capital on one?

Mr. Peacock replied stating one of the co-investments is relatively small and is in the $5 million range. The other co-investment is a bit more exposed and is in the $15 million range.

Mr. Gipson concurred and noted this co-investment is in the early stages of offshore oil and gas.

Mr. Hester asked if there have been any recent calls for either one of those co-investments?

Mr. Gipson stated both co-investments are still active and one is at risk of long term loss of capital and recently received a capital injection. Since this co-investment is in the early stages of an offshore oil and gas company, staff believes this co-investment will struggle for a bit and will require the CAPEX (capital expenditure) cycle to come back around.

Ms. Caroline Cooley asked how staff decides how many different funds to co-invest, what is the right diversification among managers, and the individual funds to balance our ability to negotiate terms? She asked if we should have bigger allocations versus the right amount of diversification? She asked how staff comes up with the right amount?

Mr. Gipson explained part of the equation is being able to manage the number of relationships and the workload. Staff has approximately 35 total manager relationships of which two or three are active partnerships within those relationships. Mr. Gipson further explained the 35 manager relationships is across all strategies as well as three secondaries.

Mr. Peacock continued presenting the performance of the portfolio on an investment by investment basis by strategy as of June 30, 2016. The co-investment program has matured and has increased volatility in taking individual company risk versus a pool of companies that is associated with a fund investment.

Mr. Peacock presented a chart of the benchmark comparison of the private equity portfolio as of March 31, 2016. The chart is relative to two private market benchmarks, which is derived from Burgiss Private I, as well as one public market equivalent benchmark. The ERS private equity remained at the top quartile and median performance well across one year (ERS 8.7%, Burgiss 75th 14.2%, Burgiss 50th 1.9%), three year (ERS 12.7%, Burgiss 75th 17.6%, Burgiss 50th 7.5%), five year (ERS 12.2%, Burgiss 75th 15.9%, Burgiss 50th 7.8%), and since inception periods (ERS 11.7%, Burgiss 75th 14.7%, Burgiss 50th 7.7%). The public market index (MSCI ACWI IMI PME) is defined as a public market equivalent to compare a public benchmark to a private market portfolio performance on a similar basis. The ERS private equity remained at the top quartile and median performance well across one year (ERS: 8.7%, MSCI ACWI IMI PME -4.4%), three year (ERS 12.7%, MSCI ACWI IMI PME 8.7%), five year (ERS 12.2%, MSCI ACWI IMI PME 8.1%), and since inception periods as well (ERS 11.7%, MSCI ACWI IMI PME 3.7%).

Mr. Ricardo Lyra presented a chart showing the private equity performance of the economic terms evolution by fiscal year of our buyout portfolio. Economic terms are carried interest or profit sharing with our fund managers and management fees. In earlier years of the portfolio, a lot of commitments were done to large, high demanding funds, which limited the ability for staff to improve economic terms. What is shown in the chart identifies market rates for buyouts, which is typically defined as 2% management fees and 20% carry interest.

Mr. Lyra noted it is staff's priority and focus to manage economic terms. He referred to the chart

showing the team has been successful in driving improvements over the years versus market rates. This has been accomplished by staff's disciplined selection process of managers whom not only provide attractive returns, but whom also will provide flexibility in terms of what will give ERS for our commitments such as economic terms or co-investments.

Mr. Lyra presented a chart showing the private equity performance of the economic terms for all private equity strategies. This is another way to manage the economic terms through diversification of investment strategies provided by different funds and different terms. In 2014, the portfolio experienced the largest decline with a total of 12.2% carry interest and 1% management fees. In 2013, the Board proactively approved a change to the investment policy allowing staff to build relationships with secondary funds. This gave staff the opportunity to take advantage of the reduced economic terms. Since the policy change, staff committed to approximately $3 billion in the years 2013 (carry interest 1.6%, management fees 18.4%), 2015 (carry interest 1.1%, management fees 14.1%), and 2016 (carry interest 1.1%, management fees 12.1%). Mr. Lyra noted staff kept management fees just at over 1% and carry interest just below 13% during those three years.

Mr. Lyra presented a chart showing the private equity performance of the savings by fiscal year. This chart showed the estimated savings of the life of commitments done in each particular year. In 2012, the private equity staff received a total realized (actual) cost savings of $16 million but estimates to receive $36 million in cost avoidance related to profit sharing and management fees over the life of the investments. The cumulative realized total cost savings is $312 million over the coming years of the commitments that we have done of which $220 million came from the savings over the last three years.

Mr. Gipson explained the savings relative to stated management fees and carried interest is specific to the co-investment, secondary funds and aggressive negotiation. The co-investments specific terms and cost savings are negotiated directly with our partners.

Mr. Lyra concluded the presentation related to the private equity performance of the savings by fiscal year. For fiscal year 2016, private equity has a cumulative realized total of $48 million in cost avoidance and savings.

Mr. Gipson presented the private equity goals and objectives for fiscal year 2016 and fiscal year 2017. In fiscal year 2016, the private equity team was unsuccessful in hiring an analyst with a real assets focus. In fiscal year 2016, the private equity completed its secondary sale of certain interests to focus exclusively on re-ups and co-investments. The team did achieve the tactical plan including our tactical exposure management through the secondary sale. In fiscal year 2017, the private equity team intends to focus on rebuilding the buyout portfolio as mentioned during the diversification discussion as well as continue to build the co-investment program.

Mr. Hester asked how Mr. Gipson describes the private equity market in general? He asked if the private equity market is considered expensive or cheap? He commented that it seemed like a lot of money chasing too few deals today. He asked if that was a fair statement?

Mr. Gipson replied that Mr. Hester's statement was fair. He stated that private equity markets are still expensive, both at the deal level and at the general partner level. There has not been a lot of relief.

Mr. Gipson presented a chart of the private equity long term goals and objectives covering 2015 through 2026. The chart showed forecasted annual commitments, projected net asset values, and exposure as a percent of the Trust Assets. He made note of the forecast target remaining at 10%. The forecast change for this year's tactical plan is that private equity commitments will assume a 4% assumption on Trust growth instead of the customarily modeled 8% Trust growth. Taking a more conservative growth assumption with enough flexibility built around tactical targets, staff can deploy capital yet adjust, as needed to maintain strategic allocations.

Ms. Donnell asked if the upcoming asset allocation study will be driven focused on private equity? She commented that based on our historical figures and experience questions have been raised about

the private equity cash flow and liquidity because it is an illiquid asset class. Although the private equity portfolio looks good, we do not have a scenario to know if we could perform better. Ms. Donnell noted she is not advocating any major increases at this time, but only suggesting these considerations be reviewed.

Mr. Hester expressed his appreciation for the staff's work on negotiating carried interest and the management fees. He noted this is a big savings to the program and to the Trust.

Mr. Gipson then introduced Altius Associates to cover the market overview.

Mr. Brad Young, co-CEO Head of investments of Altius Associates, introduced Billy Charlton and Chason Beggerow, partners, of Altius Associates. Mr. Young explained that he will be giving the Altius update. Mr. Charlton will present the private equity program update. He noted they will discuss vintage year returns, will give a general market overview, and an education piece on private equity fees.

Mr. Young reminded the Board and staff that Altius is going to be acquired by Pavilion Financial Corporation in the next couple of weeks. Altius will merge with their existing private equity group called LPCA and form Pavilion Alternatives Group. The resulting entity will have 70 employees globally, and have committed $130 billion to private alternatives. With respect to the client interface, they will have more resources to deploy for our benefit. This is something they have kept staff updated with over the last couple of months. Mr. Young asked if there were any questions. There were no questions.

Mr. Charlton presented the ERS private equity program update. The slide shown puts ERS' portfolio in context of the United States public pension plans. The message here is that the 10% or the 9.3% by dollar weight basis is right in line with the majority of the United States public pension plans. Most public pension plans allocate between 5% and 15% to private equity. ERS is well within normal bounds for a public pension plan.

Mr. Charlton reviewed performance and presented a chart that tracks the performance of the fund by year as well as segment and sub-segment of the private equity industry. He noted the J-curve is apparent in the chart. The mature funds are the level where we want them to be and the younger funds are beginning to start their investments but fees are hitting now for the younger funds. Altius expects those younger funds to be similar to the later vintage funds when time passes.

Mr. Charlton mentioned that Mr. Gipson and his team presented a public market equivalents (PME) index. Altius will report on two different indexes using the S&P 500 and the MSCI. Despite strong interim public market performance, ERS' private equity portfolio has outperformed public market equivalents since inception (ERS private equity portfolio 11.5%; PE MSCI ACWI 3.8%; S&P 500 6.3%). The portfolio has performed very well relative to the S&P 500. The three year benchmark for ERS' private equity portfolio is 12.2% compared to the S&P 500 at 15.1%. He pointed out the longer term performance showing the value of private equity in a portfolio.

Mr. Charlton began to present the private equity market statistics and outlook. Mr. Charlton continued to explain relative performance, showing a comparison chart of the global private equity and public market performance to the S&P 500. Over the long term, the ten year term, global private equity outperforms public markets relative to the S&P 500. This includes the Global Financial Crisis component back in 2008 and 2009. In more recent years, Emerging Asia has performed well, as well as the venture capital markets. He noted private equity is a long lived asset class and at times will have different outperforming segments. This is a beneficial market for United States venture capital over the last couple of years.

Mr. Charlton referred to an earlier question about the increase of valuations. He explained a small decline this last year, but prices are close to 2014. Valuations remain high. In order to offset those higher prices, fund managers are planning to pay up for the platform and instead of performing three acquisitions and rolling them into the platform, they will complete five or six. This allows fund managers to buy the smaller companies at lower valuations and end up with a combined decent valuation. He explained high valuations are the challenge in the buyout market right now. If you are paying these high prices, can you

generate the returns you have historically? He commented that is still an open question. However, distributions have been strong in 2015, expecting to see more cash back this year, which has been beneficial for the plan.

Mr. Charlton commented that similar to the United States buyout funds, European buyout funds have done well in realizing gains in their portfolios, and distributing capital back to the Limited Partners (LPs). The unexpected Brexit vote has increased uncertainty in European private equity markets in general. Deal volumes were down before the United Kingdom referendum and are likely to remain down due to increased uncertainty created by the decision to leave Europe. Short term, the uncertainty may raise borrowing costs and result in fewer IPOs. Longer term, the sterling depreciation may be beneficial to United Kingdom exporters.

Mr. Charlton noted the importance of selecting managers that have differentiation, either in deal flow or view of markets or access to top quality managers. He recommended applying a long-term and balanced perspective to investment pacing and portfolio diversification. Strong managers exist in all private equity sub-segments and managed exposure to each segment provides portfolio diversification.

Mr. Hester referred back to the geographical buyout, venture capital and growth, and distressed slide. He asked what direction should we be going and where is the value opportunity right now?

Mr. Charlton responded the dominant value opportunity is in United States buyout funds. Just the depth of the market and the quality of fund managers is there. He believes another aspect of that is the emphasis on co-investment within the program which tends to lead us more to have a United States weight to the portfolio. When you look at emerging markets it is a little more difficult to complete the co-investment strategy. It is good to have that in the portfolio for some geographical diversification, but information flows are not as strong as they are in the United States. He believes this still makes a lot of sense to have this be a United States dominated portfolio.

Mr. Charlton discussed the issue of fees. He presented the Board with a fee primer and described in detail the types of fees seen in private equity. He defined the four different types of fees, which included organizational and administrative fees, management fees, portfolio company fees, and carried interest (frequently mischaracterized as a fee).

The first fee described organizational and administrative fees, which are the fees charged in order to raise and operate a fund, including fundraising, travel expenses, legal fees for fund formation, etc. Those fees are reimbursed to the general partners (GP, otherwise known as the managers).

The second fee is our management fees. He noted this area receives a lot of attention. Management fees are usually a percent of commitment and collected annually. Those fees are collected from the limited partners (LP, otherwise known as the investors), but must be paid back before managers get carried contributions.

The third fee is the portfolio company fees, which receives a lot of confusion and is a topic in the media. The portfolio company fees are fees that the GP charges its portfolio companies for various services rendered. This could be a monitoring fee, breakup fee, or a transaction fee. Where this became problematic was that some LPs were not aware that GPs were collecting money from the LPs as well as from the companies as well. There is more discussion about the conflicts in the document provided to the Board. Now, it is more common to have portfolio management fee offsets. For 80 cents the dollar collected in portfolio fees, the fund managers will reduce the management fee they collect. So now, it is 80%. A lot of funds are asking for a 100% management fee. This is beneficial to the LPs because they are calling less capital fees. More of that capital goes into investments in the company. It is an area that continues to gather a lot of concern.

Mr. Charlton explained how carried interest is not a fee, but is a profit sharing between the LPs and GPs. Carried interest is actually just retained profits from the transactions in the fund. Carried interest gets lumped into the fee category, but is not consistent with the other type of fees.

Mr. Charlton presented a slide showing the dynamics of a private equity fund. This is a $2 billion fund that invests in seven companies and has $310 million of fees over the life of the fund. It then buys companies, generates value in them and sells them, and in total generates $4.4 billion in returns off of the $2 billion fund. He noted the $310 million of fees goes to zero because there is no value. The fund manager has to make up that ground in order to get into the carry. As the first capital comes back to the manager, to the LPs, or the $310 million, followed by the investment capital of $1.69 billion, for a total of $2 billion. Then the rest of the capital is divided up between the GPs and LPs on an 80/20 percent basis. With all that said the LPs get back $3.9 billion and the GPs keep $480 million. Often times the carry number is reported without the context of the value generated within the portfolio. It is easy to say these managers collected $480 million in fees, when in fact, they did that by generating $4.4 billion in total value of which $3.9 billion came back to the LPs. Mr. Charlton concluded his presentation answering questions.

b. Proposed Private Equity Annual Tactical Plan for Fiscal Year 2017 - Mr. Gipson presented the review and consideration of the Private Equity annual tactical plan for fiscal year 2017. He proposed to invest in 6-10 funds with commitments totaling $750 million (including investments) over the coming fiscal year. Forecasting 6-10 funds, with the standard range of plus or minus 25% (+/- 25%), provides us $560 million to $940 million in range. The focus will be on new buyout relationships and co-investments.

The IAC then took the following action:

MOTION made by Mr. Vernon Torgerson, seconded by Ms. Caroline Cooley and carried unanimously by the members present that the IAC approved the proposed revisions to the ERS Private Equity tactical plan for fiscal year 2017 as shown in Exhibit A.

The Board then took the following action:

MOTION made by Ms. Cydney Donnell, seconded by Mr. Brian Ragland and carried unanimously by the members present that the Board approved the proposed revisions to the ERS Private Equity tactical plan for fiscal year 2017 as shown in Exhibit A.

VIII. REVIEW, DISCUSSION AND CONSIDERATION OF THE HEDGE FUND PROGRAM:

a. Market Update and Program Overview - Mr. Robert Lee, Director of Hedge Funds, Mr. Anthony Curtiss, Senior Hedge Fund Portfolio Manager, and Mr. James Walsh, Albourne America, presented the review and discussion of the Hedge Fund Program and an industry overview by Albourne.

Mr. Lee introduced the Hedge Funds staff members. ERS Hedge Funds is comprised of Mr. Rob Lee, Director of Hedge Funds, Mr. Anthony Curtiss, Senior Portfolio Manager, Mr. Panayiotis Lambropoulos, Portfolio Manager, and Mr. Nicholas Maffeo, Analyst. ERS retains Albourne America as hedge fund consultant.

Mr. Lee presented an overview of the ERS Hedge Funds including the Absolute Return Portfolio, directional growth portfolio, and other hedge funds. Mr. Lee's opening comments highlighted that hedge funds are broadly used throughout the Trust and are not specifically bucketed within the Trust. In addition, Mr. Lee noted that the ERS Hedge Fund program has chosen not to use hedge fund replication strategies given his concerns regarding their ability to highly correlate to the strategies over the long-term.

The Absolute Return Portfolio acts as a diversifier to the Trust, and has been operating since 2011. At this time, the Absolute Return Portfolio is fully allocated and is approximately 5% of Trust assets. The Absolute Return Portfolio continues to maintain a low correlation and a low beta (low volatility) to the Trust. Its benchmark is T-bills plus 4%.

In turn, the Directional Growth Portfolio is a return seeking portfolio. The Directional Growth Portfolio resides within the ERS Public Equity sleeve and compliments existing public equity

exposures/allocations. At this time, there is only one investment within the Directional Growth Portfolio. This particular investment has an objective to generate an excess return above a long-only equity index.

Mr. Lee then presented several charts depicting the performance of both the Absolute Return Portfolio and Directional Growth Portfolio along with additional strategy performance. Mr. Lee noted the performance of various hedge fund indices. Specifically, Mr. Lee cited the performance of the HFRI Fund of Funds Index. The Absolute Return Portfolio has been able to outperform the HFRI Fund of Funds Index given is strategic underweight to equity oriented strategies. Lastly, Mr. Lee noted that HFRI indices are an investable index unlike many other hedge fund indices.

Mr. Lee's presentation continued with various performance metrics. He provided a chart showing the Absolute Return Portfolio as well as the Directional Growth Portfolio. One of the charts depicted the annualized return and standard deviation of each respective portfolio. The information provided was from inception to May 2016.

Mr. Lee further presented and discussed the performance of the Absolute Return Portfolio through the presentation of a Value Added Monthly Index, a scatter plot, and underlying strategy performance. Similar data was also presented for the Directional Growth Portfolio.

Mr. Lee highlighted the scatter plot which compares the monthly performance between the Trust and the Absolute Return Portfolio. Mr. Lee highlighted the visual comparison of the chart to a shotgun-like pattern. This particular pattern indicates a lower correlation between the two portfolios. In comparison, the Directional Growth Portfolio has a much tighter cluster of returns.

Mr. Tom Tull requested that examples be provided for each respective strategy that resides within the Absolute Return Portfolio (i.e. Relative Value, Equity Long/Short, Global Macro, Event Driven, and Opportunistic).

Mr. Lee explained that Relative Value represents classic hedge fund strategies which include convertible arbitrage, fixed income arbitrage, capital structure arbitrage, and market neutral.

Mr. Lee explained that Event Driven strategies can often entail a mix of equity, credit, and/or derivatives. Examples of Event Driven strategies include merger arbitrage, spin-offs, corporate bankruptcies, restructuring, and/or distressed credit investing.

Mr. Lee noted that traditional Equity Long/Short strategies typically manage their net exposures around 30%-60%. Mr. Lee highlighted the fact that equity oriented strategies are less of focus within the Absolute Return Portfolio.

Mr. Curtiss stated that Global Macro is a strategy that is focused on global trends using macroeconomic data. Mr. Lee further stated that Global Macro includes both discretionary and systematic strategies. Mr. Lee stated that an example of systematic strategies include CTAs (Commodity Trading Advisors). This type of strategy primarily trades futures contracts (and other derivatives) across equities, bonds, interest rates, and commodities.

Next, Mr. Lee highlighted the ERS Hedge Fund program's fee savings. Traditionally, the hedge fund industry has charged a standard management fee of 2% and an incentive fee of 20%. Currently, the average estimated management fee paid by ERS is around 1% while the average estimated incentive fee paid is less than 20%. Additionally, a hurdle rate applies to approximately half of the hedge fund allocations within the Trust. The hurdle rate varies amongst managers based on the strategy. Historically, hurdle rates have ranged from a flat T-Bills rate up to T-Bills + 8%. With regards to the Directional Growth Portfolio, the sole manager in the portfolio is only paid an incentive fee on relative performance to its benchmark.

The presentation was then turned over to Mr. Walsh with Albourne America. Mr. Walsh presented a performance overview of the ERS Hedge Fund program. Mr. Walsh noted that the Absolute Return

Portfolio has exceeded its strategic objective since inception and has also exceeded its tactical benchmark over the last 12-months. Per Mr. Walsh, ERS has been considered a thought leader with regards to both the structure of fee payments along with fee negotiations.

During his presentation, Mr. Walsh further highlighted the narrowing of performance returns across the industry, but with larger downside risks/drawdowns. Overall, Mr. Walsh felt that the forward looking investment environment would be challenging. Lastly, Mr. Walsh gave credit to the ERS Hedge Fund team for being proactive on both negotiating fees and on pushing for additional transparency.

There were no questions or further discussion, and no action was required on this item.

b. Proposed Revisions to the ERS Investment Policy Addendum X: Hedge Fund Policies and Procedures - Mr. Curtiss presented the review and consideration of the hedge fund-related proposed revisions to the ERS Investment Policy Addendum X: Hedge Fund Policies and Procedures for fiscal year 2017.

The chart presented by Mr. Curtiss showed a reduction to the lower band of the Event Driven strategy allocation from 20% to 0%. A portion of this reduction would be reallocated to the Opportunistic strategy. The new proposed bands would be 0%-60% for Event Driven and 0%-40% for Opportunistic. Rationale for the changes was a desire for additional flexibility in allocating to strategies that are less correlated to traditional equity and credit markets.

Mrs. Caroline Cooley asked for further clarity around Opportunistic strategies. She also felt that the strategy should have a defined benchmark and requested Staff to work with Albourne in defining an appropriate benchmark.

Mr. Lee agreed to work with Albourne on defining a benchmark for the strategy. Mr. Lee noted the following strategies as a potential fit within the Opportunistic strategy: reinsurance, factoring, or co-investment opportunities. Mr. Lee also noted that most of these strategies involve a closed-end fund structure, but with a shorter life relative to private equity.

The IAC then took the following action:

MOTION made by Mr. Vernon Torgerson, seconded by Mr. Bob Alley and carried unanimously by the members present that the IAC approved the proposed revisions to the ERS Hedge Fund program policies and procedures for fiscal year 2017 as shown in Exhibit A.

The Board then took the following action:

MOTION made by Ms. Cydney Donnell, seconded by Mr. Doug Danzeiser and carried unanimously by the members present that the Board approved the proposed revisions to the ERS Hedge Fund program policies and procedures for fiscal year 2017 as shown in Exhibit A.

c. Proposed Hedge Fund Annual Tactical Plan for Fiscal Year 2017 - Mr. Curtiss presented the proposed Hedge Fund Program Annual Tactical Plan for Fiscal Year 2017.

Mr. Curtiss reported that the Absolute Return Portfolio has reached its targeted allocation of 5% of the Trust's assets. The benchmark remains T-Bills + 4%. Overall, strategy allocations have remained fairly static with an emphasis on Relative Value and Event Driven. Global Macro has been a strategic underweight and additive from a relative performance standpoint. Going forward expectations are to increase Global Macro and Opportunistic strategies given that these two strategies often exhibit a lower correlation to traditional fixed income and equity markets.

Mr. Curtiss noted that the Directional Growth Portfolio is still comprised of one investment as of May 31, 2016. The current allocation is to an extension strategy; however, going forward additional consideration will be given to other strategies.

There are no additional allocations expected for either the Global Credit Portfolio or the Real Assets Portfolio. In full disclosure, one investment was made to the Special Situations Portfolio as of June 1, 2016. This allocation was for $100 million.

Mr. Hille stressed to the group his desire for additional transparency around the Opportunistic strategy. He noted his additional concerns around allocating to less liquid opportunities. Mrs. Cooley concurred with the statements made by Mr. Hille.

Mr. Lee agreed to further transparency and stated that around 85% of the portfolio could be liquidated within 12 months. Overall, liquidity is not an issue.

The IAC then took the following action:

MOTION made by Ms. Caroline Cooley, seconded by Mr. Bob Alley and carried unanimously by the members present that the IAC approved the ERS Hedge Fund Program annual tactical plan for fiscal year 2017 as presented in Exhibit A, to be added as an appendix of the ERS Hedge Fund Program Policies and Procedures.

The Board then took the following action:

MOTION made by Ms. Cydney Donnell, seconded by Mr. Doug Danzeiser and carried unanimously by the members present that the Board approved the ERS Hedge Fund Program annual tactical plan for fiscal year 2017 as presented in Exhibit A, to be added as an appendix of the ERS Hedge Fund Program Policies and Procedures

IX. REVIEW AND DISCUSSION OF THE ASSET ALLOCATION STUDY

Mr. Tom Tull, Chief Investment Officer, and Ms. Sharmila Kassam, Deputy Chief Investment Officer, presented the review and discussion of the Asset Allocation Study. The Asset Allocation topic is an important decision that the ERS Board of Trustees will determine in the next couple of years. This is a key component of the Investment policy. Section 2.2 of the ERS Investment policy states a formal Asset Allocation Study will be conducted at least every five years. The ERS team, IAC members, and Board members will begin the process with a preliminary road map as we go forward.

Mr. Tull described the Asset Allocation Study as one conducted by the Board of Trustees with the advice of the IAC, supported by ERS staff as well as ERS' pension plan consultant, Aon Hewitt Investment Consulting (AHIC). An Asset Allocation Study provides fiduciaries with an understanding of the dynamic relationship between plan assets and liabilities over time. The Asset Allocation Study illustrates the impact of various asset allocation targets on required contributions and funded status under a range of different macro-economic scenarios. The Asset Allocation Study identifies future trends in the financial health of the plan based on economic uncertainties that may not be evident from an actuarial valuation, which provides only a snapshot at a point in time. Finally, the Asset Allocation Study helps determine the level of risk that is appropriate in the context of the plan's liabilities.

Mr. Tull provided background information of the Asset Allocation Study. The Study is conducted at least every five years with annual reviews of the adopted asset allocation. The most recent Asset Allocation Study was completed and adopted as of February 26, 2013. The last studies focused on incorporating alternative asset classes not previously adopted in ERS' Investment Program and assessing related implementation. The focus of this Asset Allocation Study will be to measure the Board's risk tolerance and investment objectives to determine where the asset allocation should go for the next five years. The advantage moving forward is that ERS has already gone through this process a few times and has had a robust current asset allocation from prior studies.

Mr. Tull explained the Asset Allocation Study is a key component for establishing the ERS Investment Policy. In pursuant to Texas Government Code Section 815.301(e), the Board is to develop

written investment objectives of the assets of the retirement system referred to as the Investment Policy. It is imperative that ERS structure the Trust to earn an appropriate risk-adjusted rate of return and a net of fees that provide benefit payments for not only ERS members, retirees, but also beneficiaries of the retirement plan. The Asset Allocation Survey will show what the Board, IAC, and staff risk tolerance is in terms of what our risk tolerance is today, versus what the risk tolerance has been in the past. Historically, we have seen modest adjustments in risk tolerance over the last 15 years by the Board. He noted these are different times and that could change. The investment objectives and the asset mix overall are based on what we are comfortable with in terms of adjusting the portfolio to get the maximum rate of return for the amount of risk that is involved. Timing is always part and parcel with this entire process to ensure investment governance and performance evaluation.

Ms. Kassam presented the Asset Allocation liability process. She explained the Asset liability process is the main driver for setting long-term policy allocations for public pension plans. To measure risk tolerance, a survey will be sent to the Board, IAC, and staff. There will be a lot of objectives discussed in terms of the plan. There were some questions from Ms. Cooley and Mr. Hille during the meeting asking about return expectations as well as portfolio construction and dynamics. Staff is looking at whether we have the appropriate portfolios and if they are aligned towards appropriate benchmarks. These inquiries will be discussed in context including a lot of educational meetings held individually with Board and IAC members as well as at the upcoming December workshop. ERS' pension plan consultant, AHIC and ERS staff members have begun to work on the Asset Allocation Study. The strategy proposal implementation will require input from the Board and IAC in terms of how that develops for calendar year 2017. There are new Board and IAC members since our last Asset Allocation Study. This is a process that will be driven by the Board; however the process will not drive the decision. Staff expects to spend time discussing any of the aspects about the different dynamics that go into this process, along with the experience study that will be conducted in calendar year 2017.

Ms. Kassam presented the Asset Allocation Study proposed working schedule. She explained the proposed working schedule is a draft of a timeline that will change as we move through the discussions and processes. She noted up to this point, ERS has conducted asset allocation education during the quarterly performance at Board meetings in terms of what is important about different asset classes and how the pension experience study and the asset allocation are going to be concurrently conducted. Ms. Kassam reiterated the Asset Allocation Liability Risk Survey will be distributed to the Board, IAC, and staff members in September or October 2016. The results will be oriented by staff at the upcoming December Board meeting and will be open for discussion. She explained the rest of the timeline shows different working sessions throughout calendar year 2017. The timeline will adapt to the needs of the process and discussions at the direction of the Board. The end goal is to present a recommendation for the Board and the IACs consideration, along with any investment policy changes that would require formal implementation.

Mr. Tull explained the Asset Allocation proposed working schedule shows the working sessions will occur throughout calendar year 2017 and during our regularly scheduled Board meetings. Staff can expand the schedule at any point at the request of the Board or IAC.

Mr. Vernon Torgerson commented that it was discussed that capital market assumptions were going down as we go into the Asset Allocation Study. He asked Mr. Porter Wilson, Executive Director, how sympathetic the Legislature may be a year from now?

Mr. Wilson reported his experience at the Capital this last spring and mentioned there were questions on the assumed rates of return. He believes there are concerns similar to what has been expressed about the challenges and realization in reaching an 8% return. He commented there were very specific questions during the Senate Finance hearing.

Mr. Kassam clarified the 8% is based on a 30 year return and there is a 7.5% on the five year and ten year horizon. The point has been discussed that those return expectations on both time frames are likely to be lower.

Mr. Tull commented as a point of reference to remember we used a 3.5% inflation rate and we are talking about a 2.1% inflation rate. So we do expect some variation.

Mr. Hester also thanked the IAC for their commitment to ERS and its beneficiaries.

There were no questions or further discussion, and no action was required on this item.

X. ADJOURNMENT OF THE BOARD OF TRUSTEES AND INVESTMENT ADVISORY COMMITTEE AND RECESS OF THE BOARD OF TRUSTEES

The August 16, 2016 Joint Meeting of the ERS Board of Trustees and Investment Advisory Committee adjourned at 11:40 pm CT.

PUBLIC AGENDA ITEM #2a

Review and Discussion of ERS' Asset Allocation Study:

2a. Featured Speaker Michael Hood on Asset Allocation

December 1, 2016

BACKGROUND:

Michael Hood, Managing Director at J.P. Morgan Asset Management, is a research analyst on the GIM Solutions – Multi-Asset Soutions team. He provides qualitative economic and market insights to inform Multi-Asset Solutions' investment process. He helps to establish broad macroeconomic themes that are reflected across all portfolios managed globally by the team.

Mr. Hood will present his perspective on macroeconomic trends and market events to help better determine the factors involved in ERS' asset allocation.

STAFF RECOMMENDATION:

This agenda item is provided for informational and discussion purposes only. No action is required.

ATTACHMENT – 1

Exhibit A – Biographical Information for Michael Hood

EXHIBIT A

Michael Hood Biography

Michael Hood**,** *managing director*, is a research analyst on the GIM Solutions – Multi-Asset Solutions team and provides qualitative economic and market insights to inform Multi-Asset Solutions' investment process. He helps to establish broad macroeconomic themes that are reflected across all portfolios managed globally by the team. He came to JPMAM in October 2011 from Traxis Partners, a USD1bn+ macro hedge fund based in New York. There, he served as chief economist from 2007 to 2011, maintaining detailed forecasts for global variables. He produced a monthly global outlook publication and frequent stand-alone pieces on a range of developed and emerging-market economic issues. Previously, he worked as an economist and market strategist at Barclays Capital (within the emerging markets research department) and the JPMorgan investment bank (within the economic research department). At JPMorgan, he began, in 1994, as an economist for several Latin American countries. Later, he oversaw JPMorgan's Latin American economic research effort and helped coordinate the department's global views. He contributed to and helped edit many JPMorgan publications, including the weekly "Global Data Watch" and quarterly "World Financial Markets." He also created and edited the quarterly "Latin American Economic Outlook" publication. At Barclays Capital, where he worked from 2004 to 2007, he worked on a combination of economic and market-strategy topics within emerging markets, again writing for and helping edit a variety of publications. While at JPMorgan and Barclays Capital, he frequently traveled to Latin America and spoke to a wide range of clients, including institutional investors, corporations, and private equity sponsors. He began his career in the research department at the Federal Reserve Bank of New York, where he worked from 1992 to 1994 on a variety of international-finance and developing-country topics. In this capacity, he wrote many country-risk studies used by federal bank regulators.

PUBLIC AGENDA ITEM - #2b

Review and Discussion of ERS' Asset Allocation Study:

2b. Presentation of Risk Survey Results

December 1, 2016

BACKGROUND:

The most important component of an investment strategy is the asset mix, or the resource allocation among the various classes of securities available to the Employees Retirement System of Texas (ERS) for investment purposes. The ERS Board of Trustees (Board) shall set long-term asset allocation targets or ranges that will prudently meet the needs of the Plan Beneficiaries. Section 2.2 of the ERS *Investment Policy* states formal asset allocation studies will be conducted at least every five years, with annual reviews of the adopted asset allocation based on updated capital market assumptions.

An important first step of the asset/liability study is to collect feedback from the various constituents within ERS. As such, a survey was created to gauge the risk preferences and objectives, as well as other feedback from the Board, IAC and members of ERS' Senior Staff.

Aon Hewitt Investment Consulting, Inc. (AHIC) and staff aggregated the results of the risk survey to present aggregated results trended against the past risk survey conducted for the prior asset liability study. Individual responses will remain anonymous.

STAFF RECOMMENDATION:

This agenda item is provided for informational and discussion purposes only. No action is required.

ATTACHMENT – 1

Exhibit A – Risk Survey Results

ERS

Public Agenda Item #2b

Review and Discussion of ERS' Asset Allocation Study
Presentation of Risk Survey Results

December 1, 2016

Tom Tull, CFA, Chief Investment Officer

Sharmila Kassam, CPA, Deputy Chief Investment Officer

Steve Voss and Kristen Doyle, Aon Hewitt

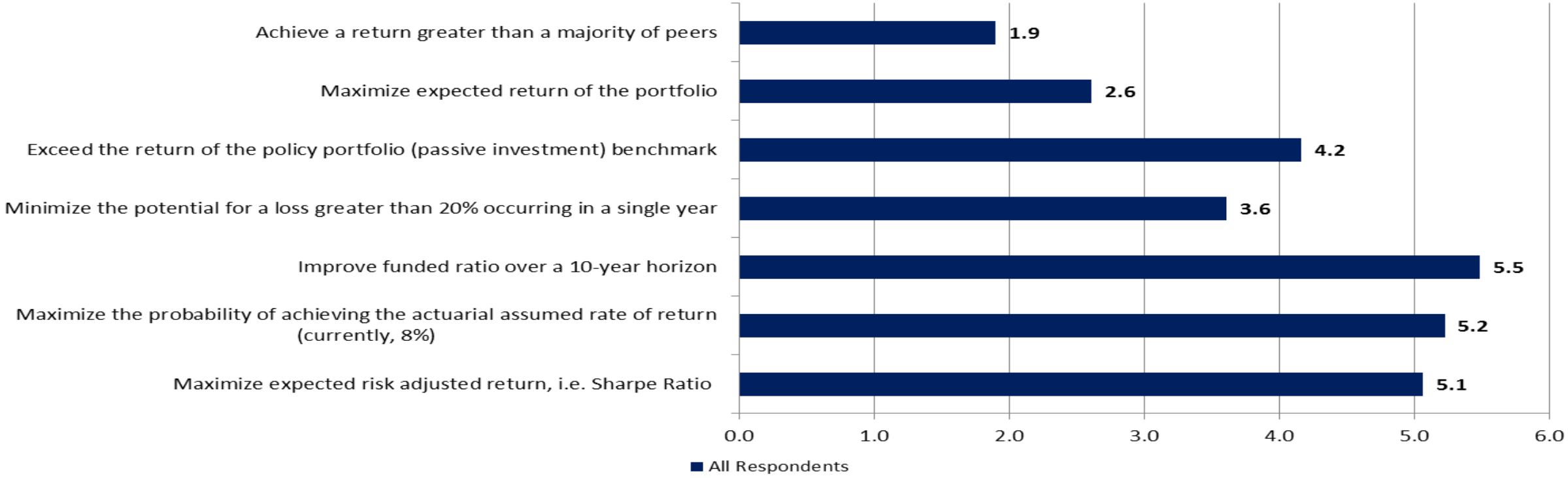
Agenda

- We are in the early stages of the 2016 Asset Liability Study. So far we have:
  - Developed a detailed work plan
  - Completed survey of the Board, IAC, and Senior Staff (Thank you!)
  - Agreed upon capital markets assumptions with Staff

- The goal of the survey was to:
  - Ensure participation and fulfillment of fiduciary duty
  - Gauge risk preferences and objectives
  - Obtain critical feedback

- Goal for today:
  - Provide an overview of the survey
  - Discuss the various perspectives

Investment Objectives : Average Rankings – Aggregate Responses Question #1

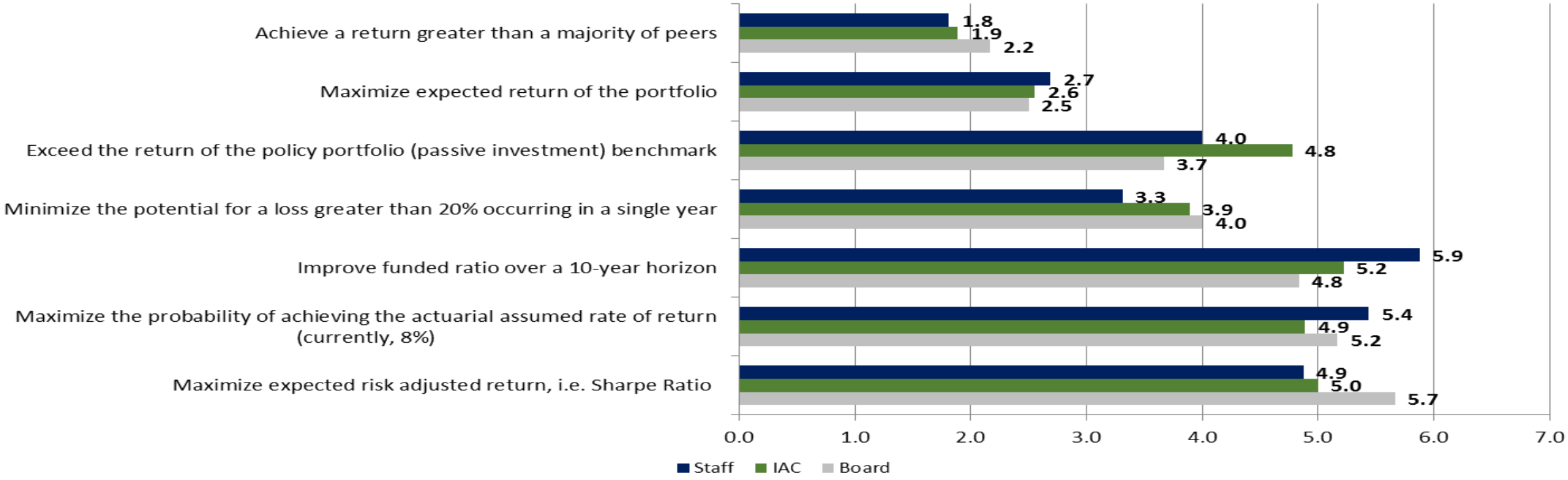


Observations:

- Recall that a high rating indicates “most important”
- In aggregate, improving the funded ratio over a 10-year period received the highest ranking
- Performance relative to peers remains the lowest priority

Empower Results®

Investment Objectives: Average Rankings – By Group
Question #1

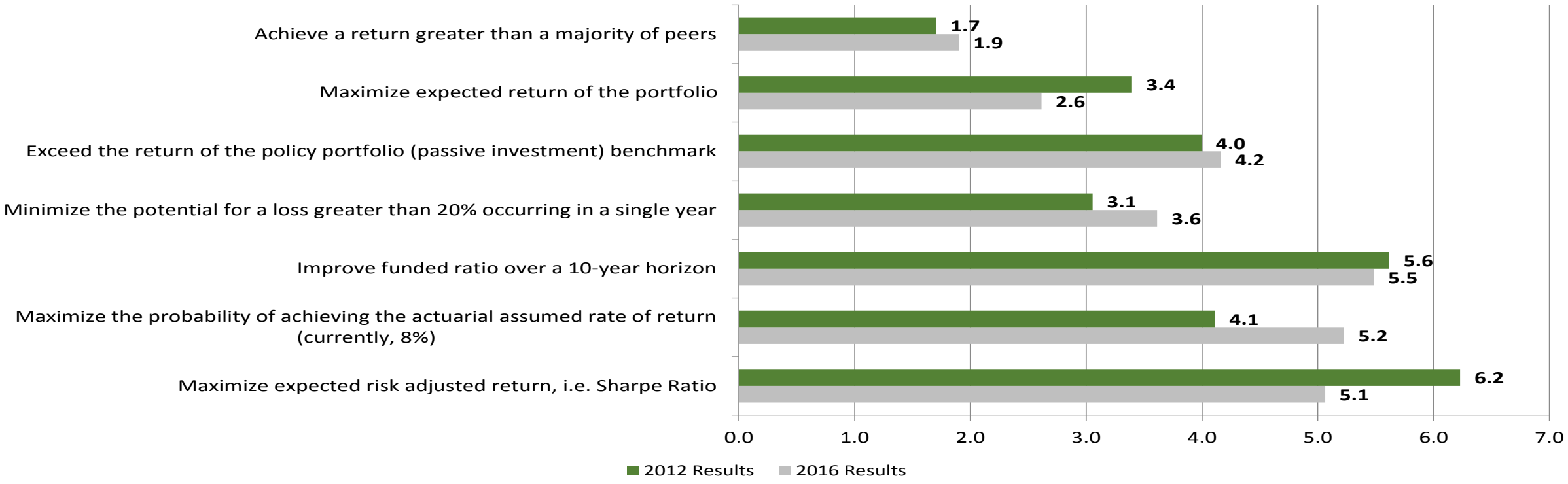


Observations:

- Strong support for maximizing risk adjusted returns and increasing the probability of meeting the actuarial rate of return

Empower Results®

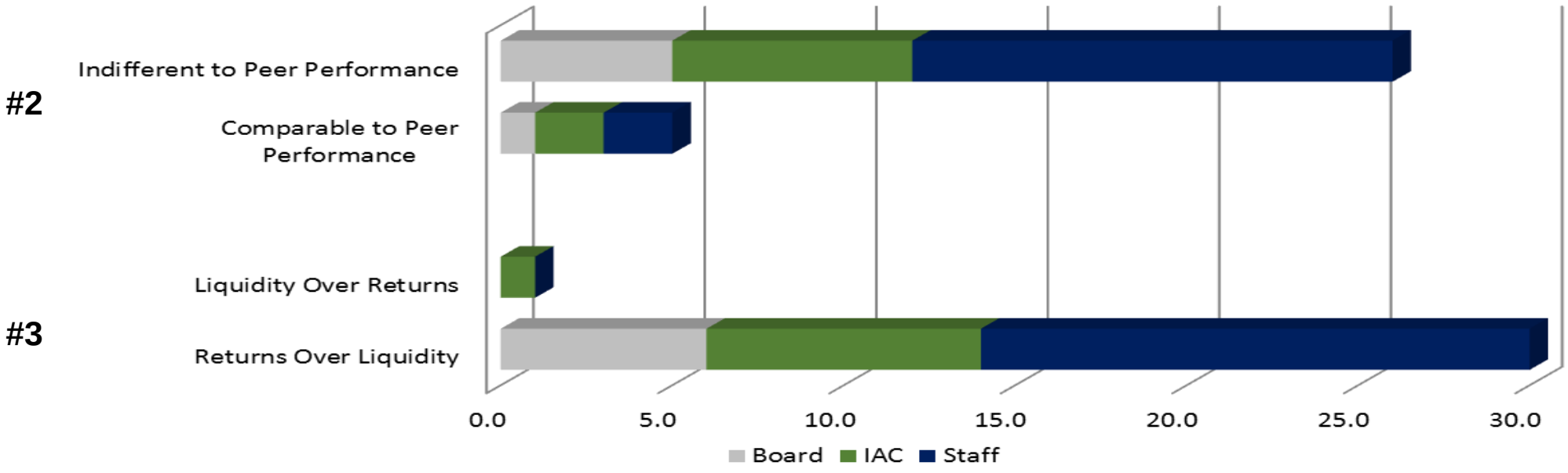
Investment Objectives : Average Rankings – 2012 vs 2016



Observations:

- The largest changes since 2012 are a reduction of 1.1 from the desire to maximize expected risk adjusted return and a corresponding 1.1 increase in maximizing the probability of achieving the actuarial rate of return; however, both remain high priorities
- Improving the funded ratio over a 10-year horizon continues to be a high priority as well

Trade-Off Results – Questions 2 & 3

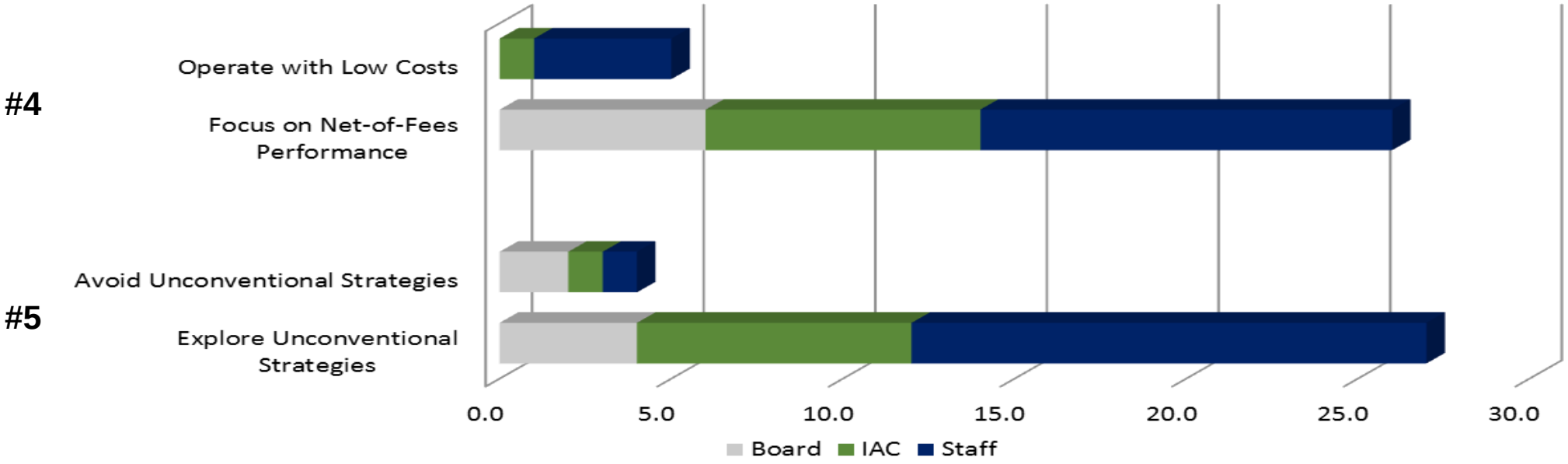


Observations:

#2: As is the case with the rank order exercise, few participants place much importance on peers

#3: Clear (nearly unanimous) feedback that ERS can withstand some elements of illiquidity as it seeks investment return

Trade-Off Results – Questions 4 & 5

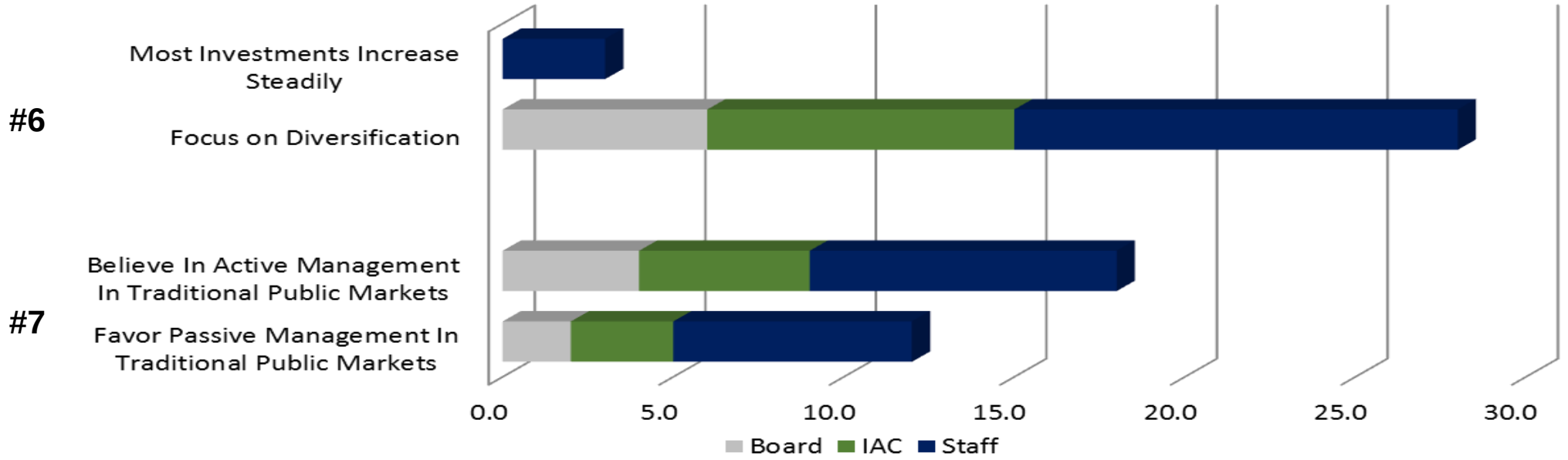


Observations:

#4: There is strong support for monitoring and maximizing net-of-fee performance instead of simply seeking the lowest cost option

#5: There is a clear appreciation of the complexity of investments and the ability to enhance returns through unconventional strategies

Trade-Off Results – Questions 6 & 7



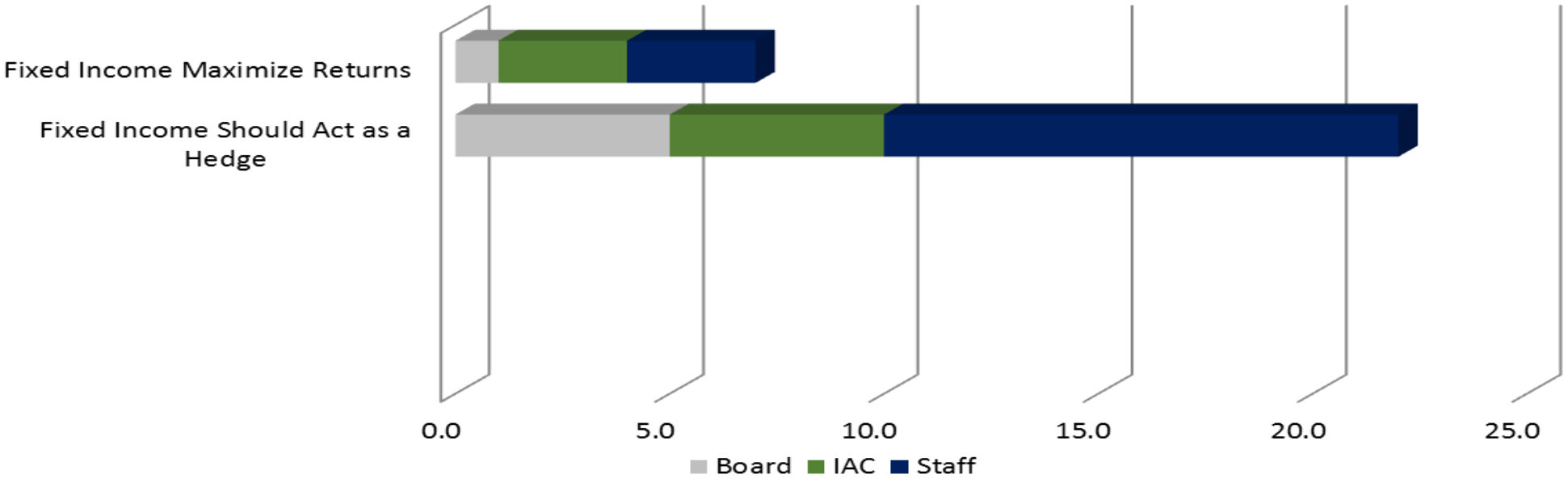
Observations:

#6: Strong perspective that there are benefits to diversification

#7: Results indicate a moderate willingness to accept active risk in order to achieve enhanced returns in the public markets

Trade-Off Results – Questions 8

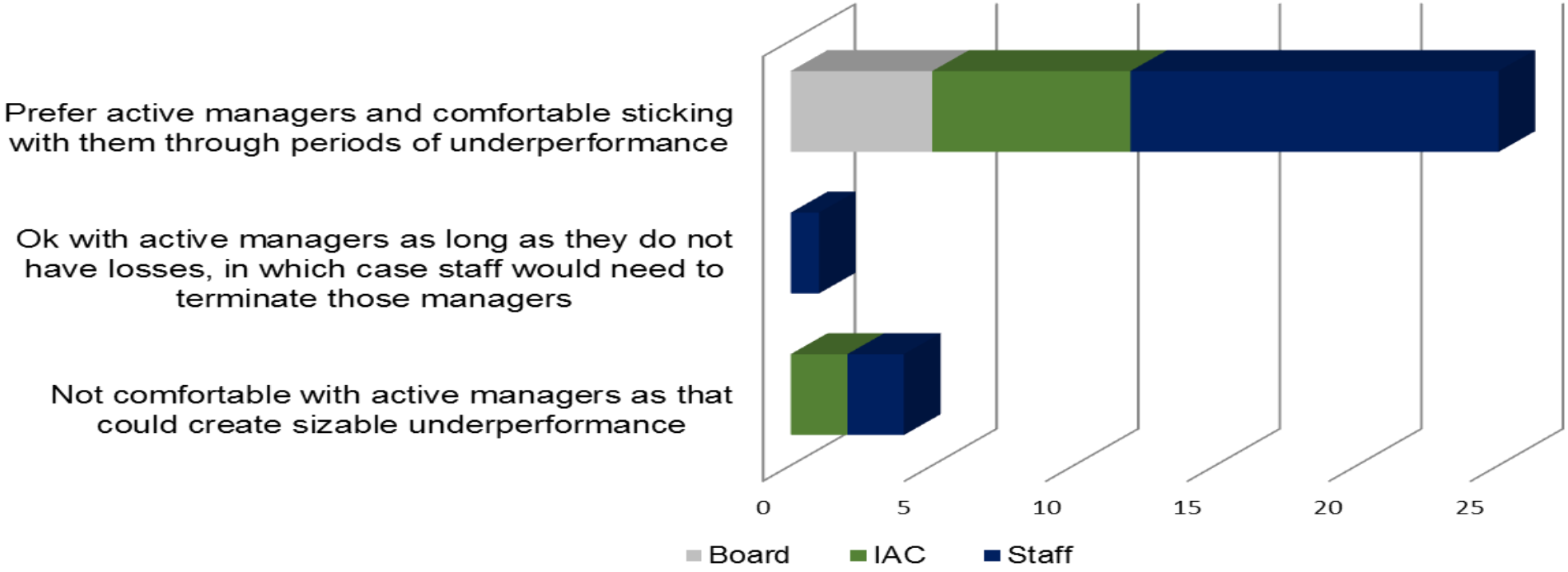
#8



Observations:

#8: 3 to 1 participants believe that the fixed income portfolio should represent a hedge in the overall asset allocation

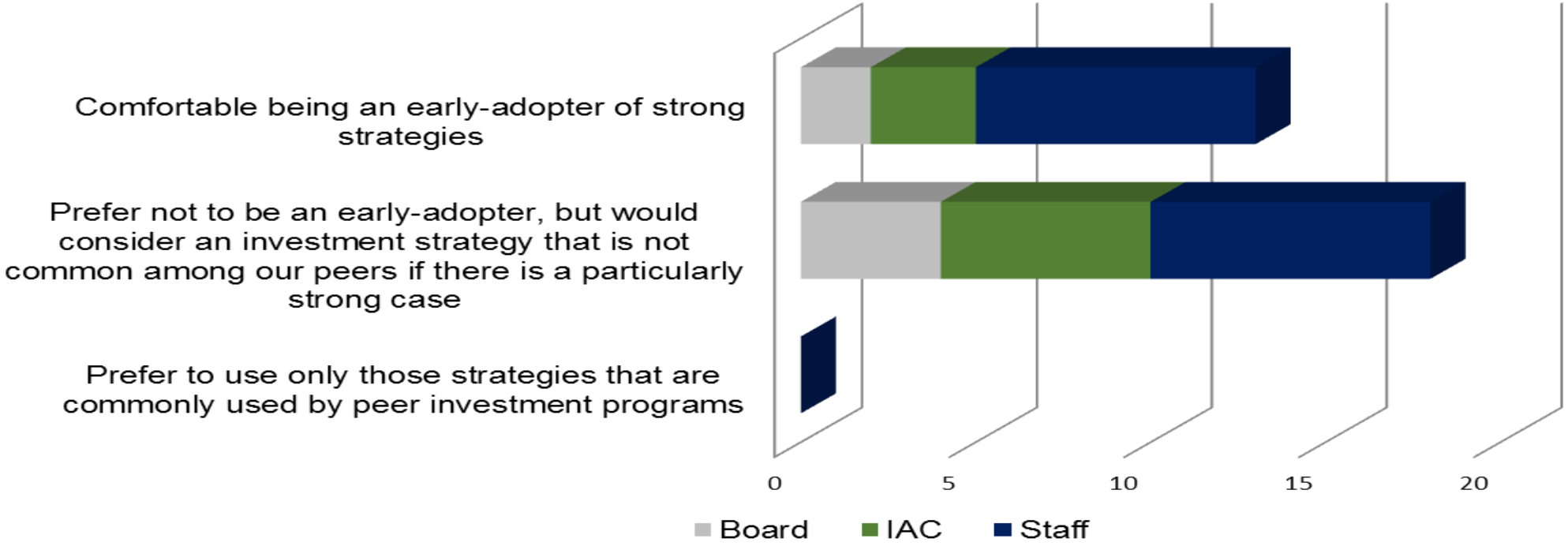
Active Managers – Question 9



Observation:

#9: There appears to be a broad level of comfort with active investment managers and periods of underperformance, as long as Staff believes in the team and process of the managers

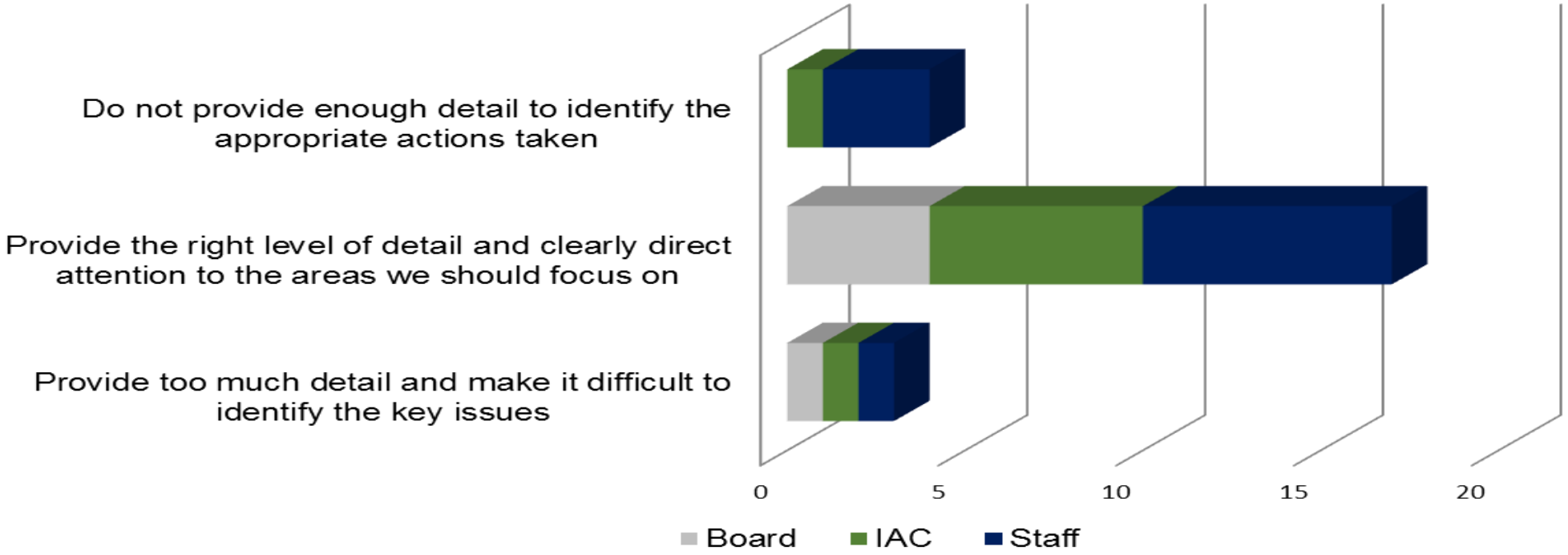
Investment Strategies – Questions 10



Observations:

#10: There are mixed views on the willingness to be an early adopter with an edge toward not being an early adopter

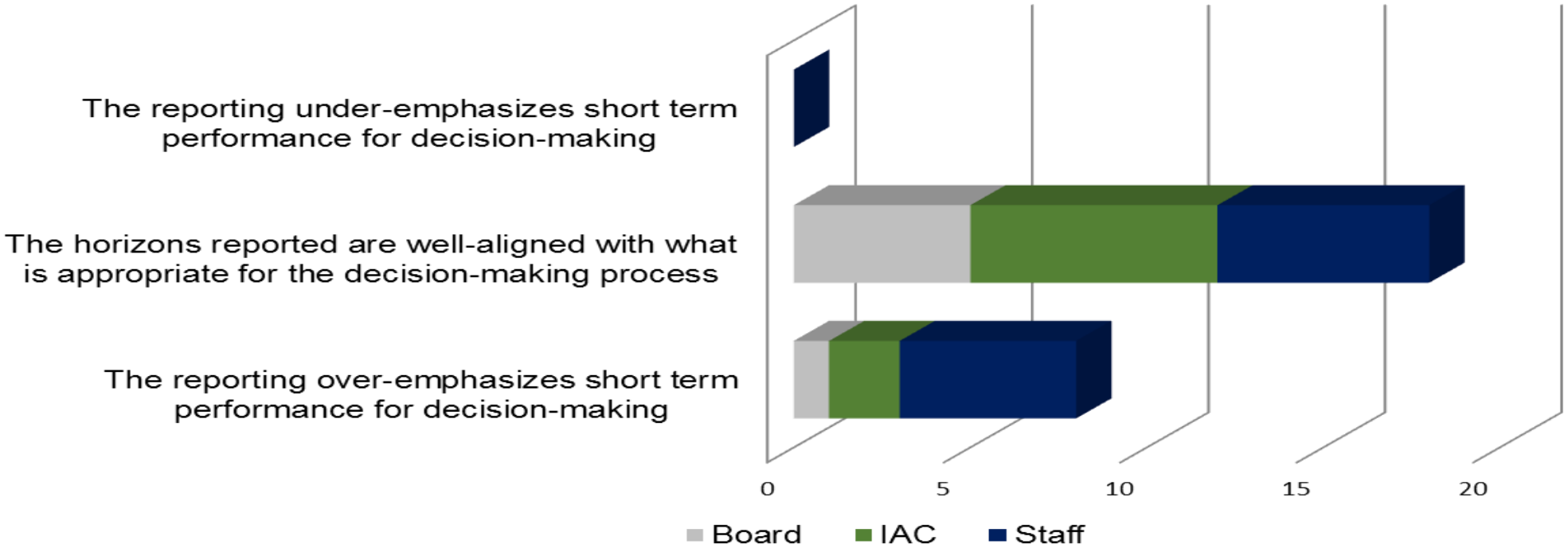
Performance Reporting – Questions 11



Observations:

#11: Most respondents believe the performance reports received from the consultant provide the right level of detail, with some preferring more or less detail

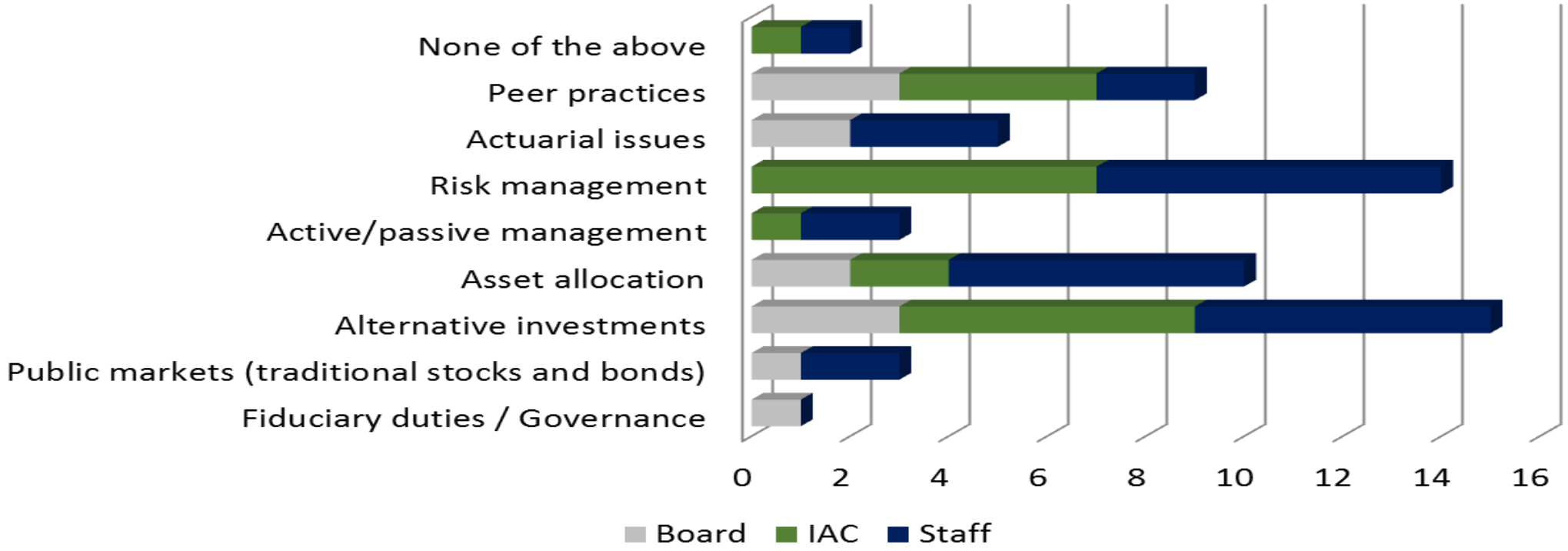
Time Horizons – Questions 12



Observations:

#12: Most respondents believe the time horizons in the performance reports are well aligned with the decision making process, with some individuals believing the horizon is too short

Future Education Areas– Questions 13



Observations:

#13: Alternative investments, asset allocation, risk management, and peer practices are all areas that the Board, IAC, and Staff continue to be interested in learning more

Additional Comments and Feedback

1. Belief that strong investment results and governance will help maintain financial health of the system

2. Several comments across respondents related to a risk/reward framework for investment decision making:
   - **Active Management** – “should be used where there is the greatest inefficiencies”
   - **Early Adoption** – “early adoption should be seen as an opportunity versus risk”
   - **Performance Objective** –
     - “state the objective as maximizing our return for a given (chosen) level of risk”
     - seek to “minimize large drawdowns/losses”
     - “it's important to focus on the long term funded status of the trust, with strong risk adjusted returns as a framework”

3. Openness to exploring innovative investment strategies but recognizing there is no free lunch

4. Desire for a robust process associated with manager selection and new investment ideas

Summary of Survey Results

- Survey results are generally consistent with the 2012 survey and responses did not include any “surprises” or deviations from what we expected to see

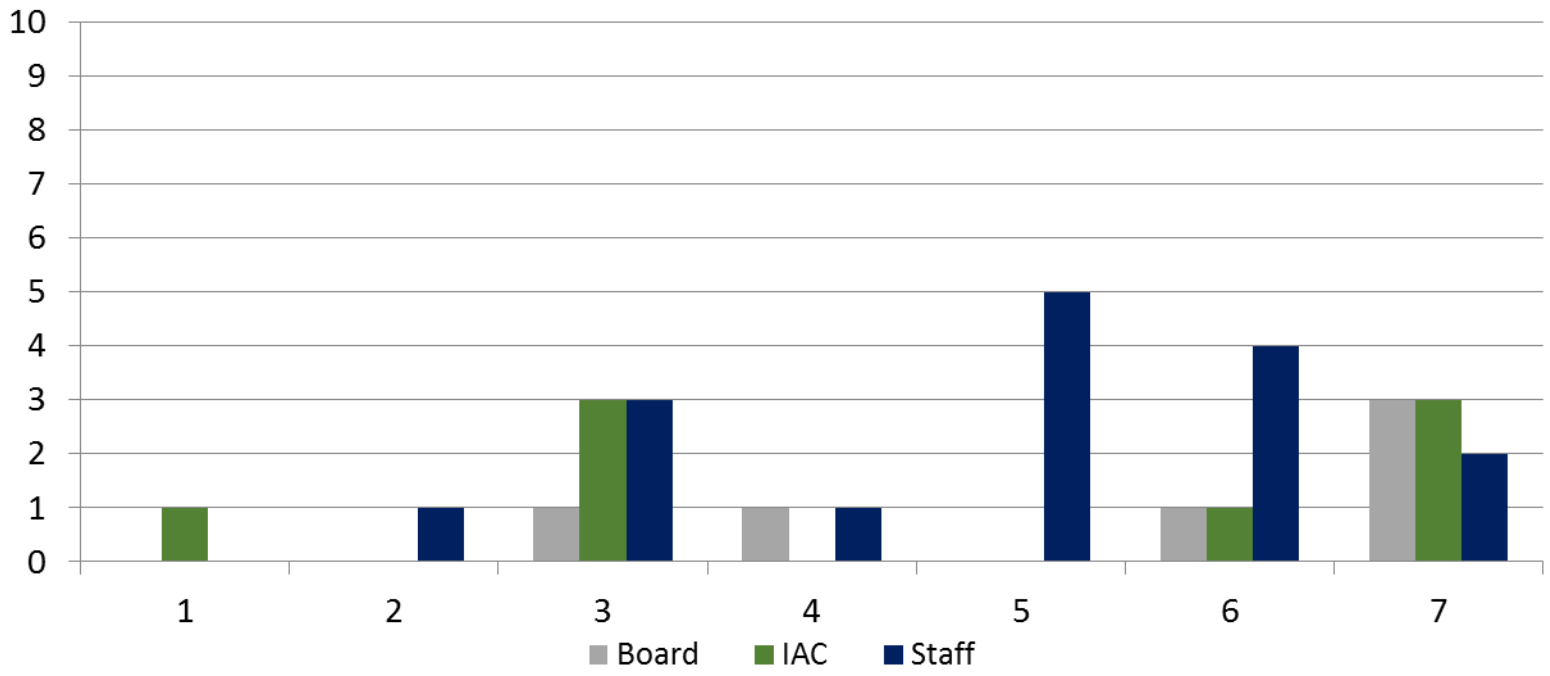
- In summary, what appears to be most important to the Board, IAC, and Staff are:
  - Achieving strong returns but at a reasonable level of risk
  - Utilizing diversification as an important component of achieving objectives
  - Allowing illiquidity in seeking to enhance returns
  - Keen interest in new strategies that will increase the probability of maximizing the risk-adjusted return and improving the funded ratio

- Comments associated with each question set and additional detail on question #1 are provided in the appendix

Appendix

Empower Results®

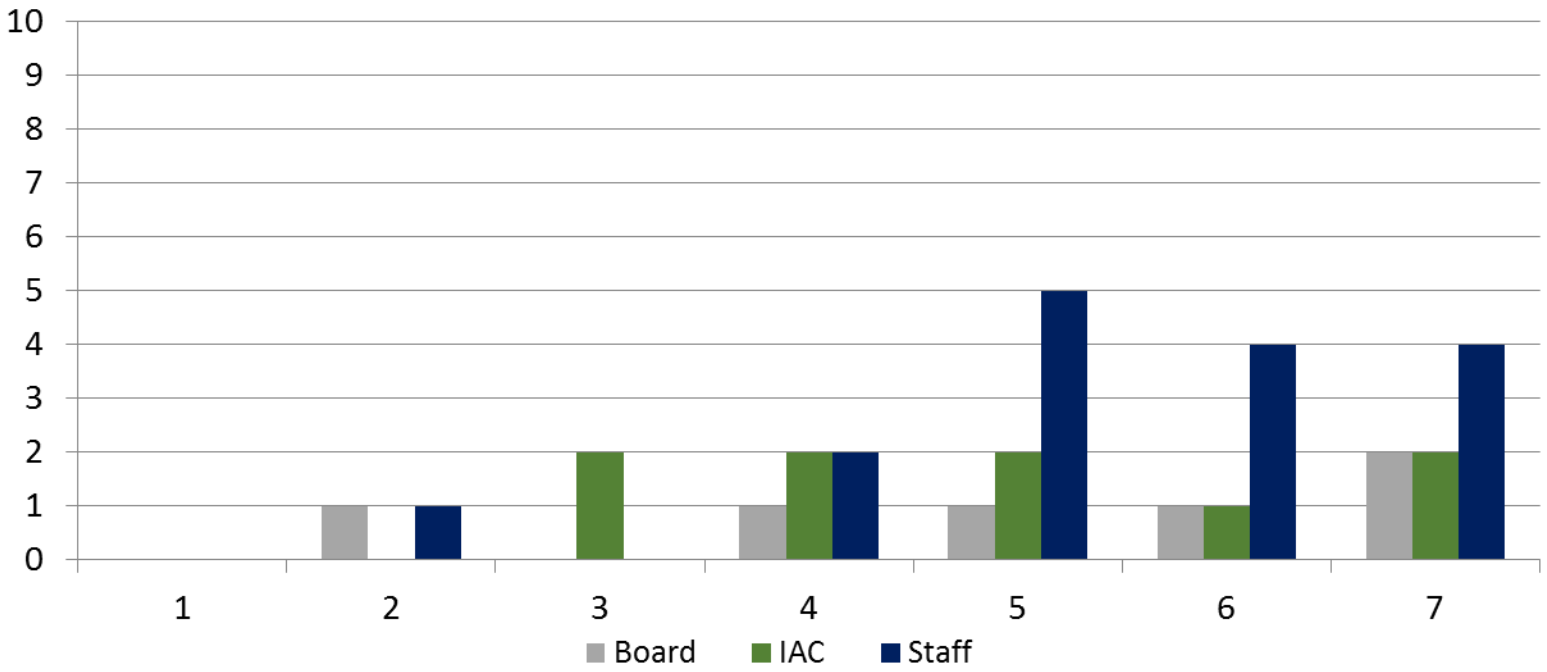
Investment Objectives
Maximize Expected Risk Adjusted Return



Observations:

- As noted on the previous slide, many participants ranked maximizing risk adjusted return as highly important.

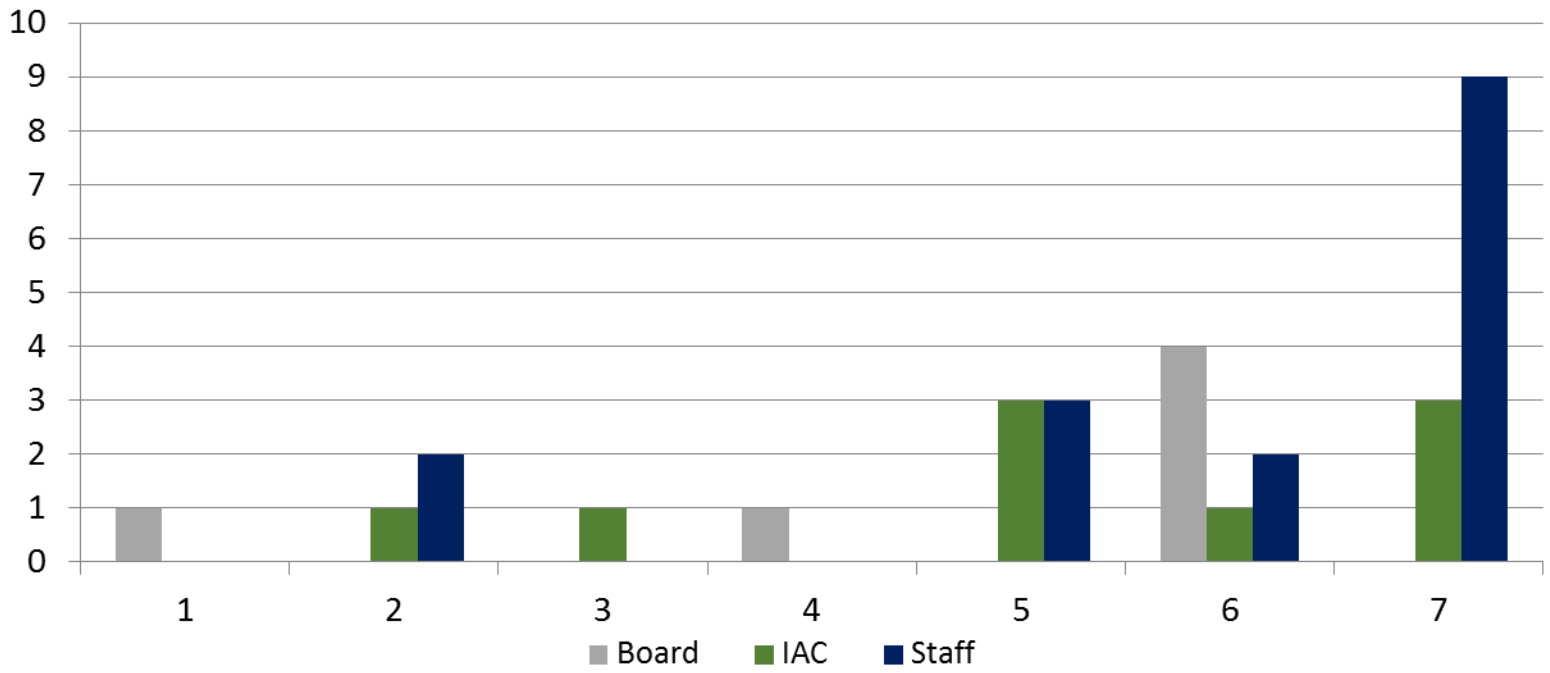
Investment Objectives
Maximize Probability of Achieving Actuarial Rate of Return



Observations:

- Responses to maximizing the probability of achieving the actuarial rate of return were mixed for the Board and IAC, but consistently of more importance to Staff.

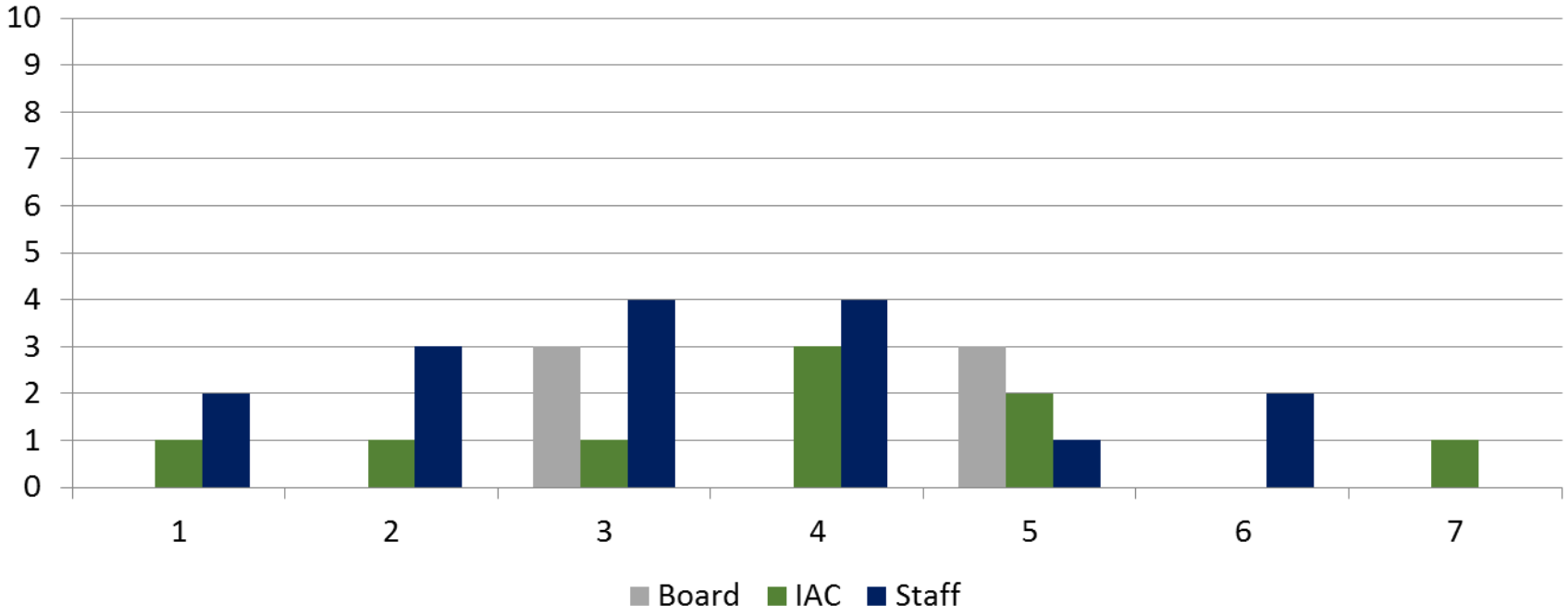
Investment Objectives
Improve Funded Ratio



Observations:

- Responses broadly indicate that improving the funded ratio is an important objective for Staff, IAC, and the Board.

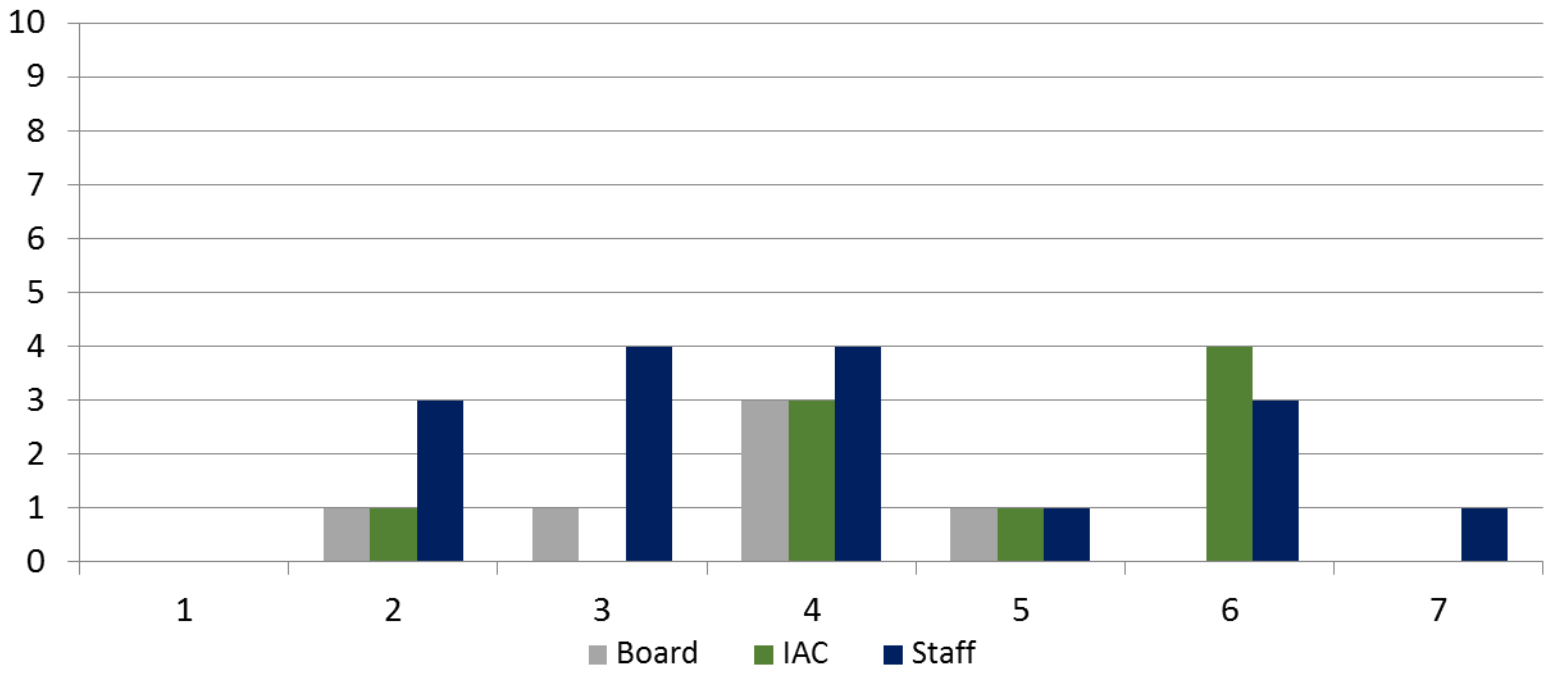
Investment Objectives
Minimize Potential for Loss Greater Than 20% in a Single Year



Observations:

- The middle of the distribution tends to be high for the Board, IAC, and Staff; highlighting the general perspective that this topic is of moderate to lower importance to most.

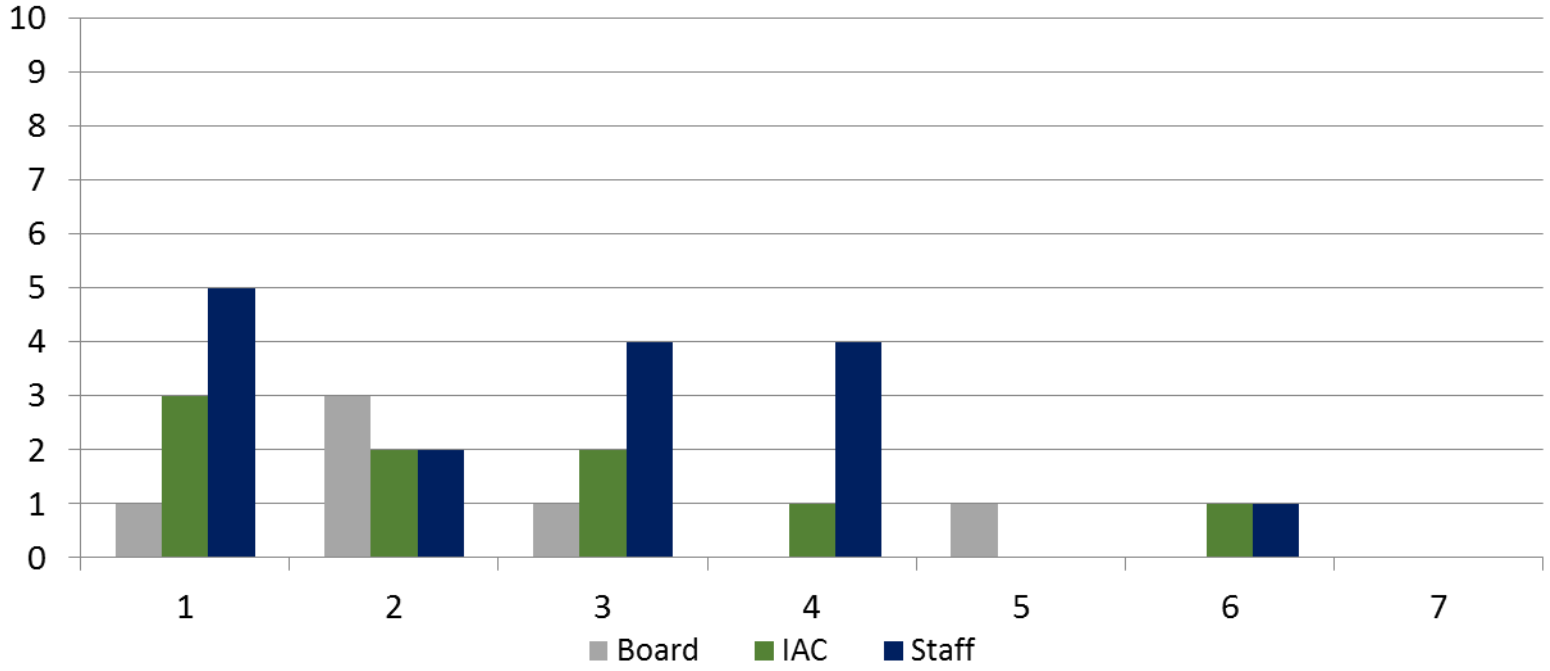
Investment Objectives
Outperform Policy Portfolio



Observations:

- Participant ranks for outperforming the policy portfolio were mixed, with most responses falling between ranks 2 to 6.
- This goal is moderately important for most participants.

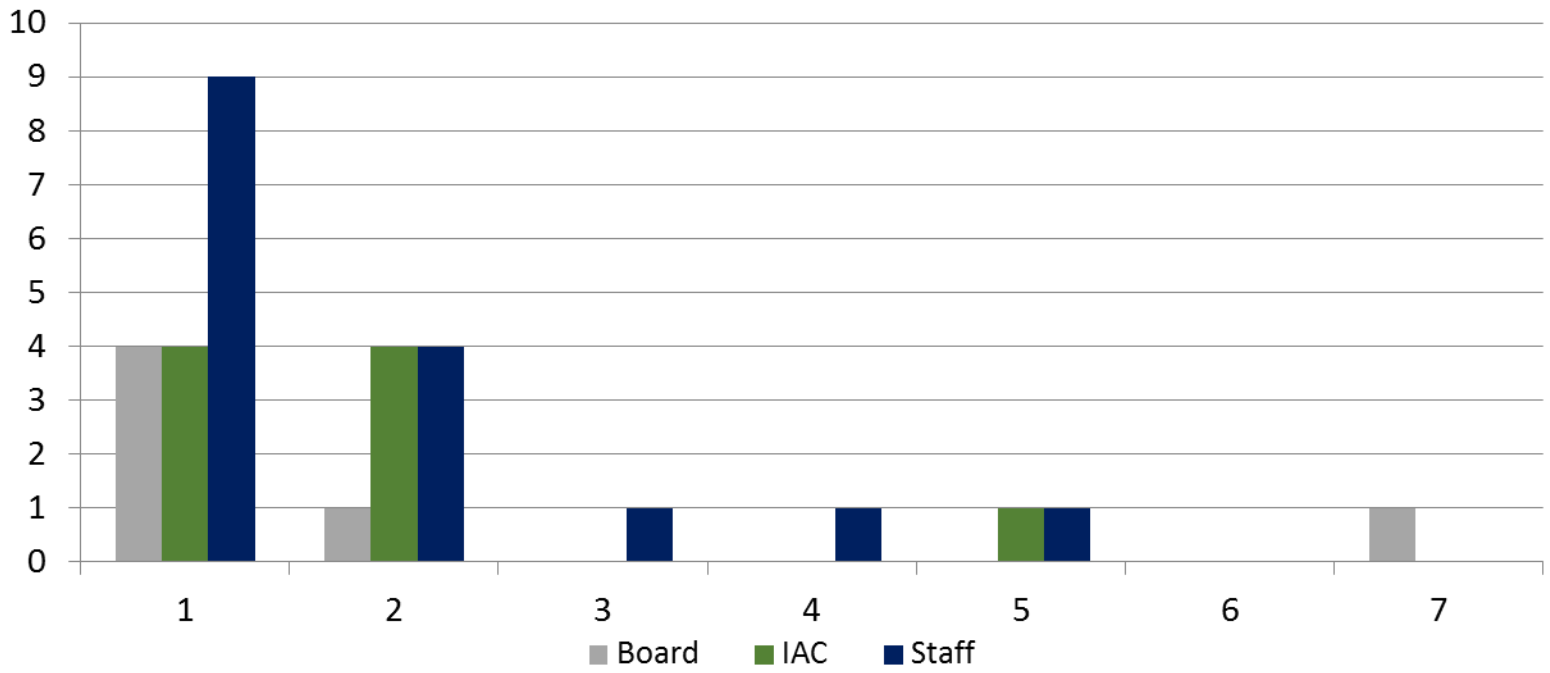
Investment Objectives
Maximize Expected Return



Observations:

- Participants generally ranked this objective lower in importance with most rankings falling between 1 to 4.

Investment Objectives
Achieve Return Greater Than Peers



Observations:

- The Board, IAC, and Staff feel that achieving returns greater than peers is much less important than other objectives.

PUBLIC AGENDA ITEM #2c

Review and Discussion of ERS' Asset Allocation Study:

2c. Capital Market Assumptions

December 1, 2016

BACKGROUND:

A pension plan's strategic asset allocation is the primary determinant of investment return and the risk associated with that return. At least every five years ERS Board of Trustees (Board) conducts, with the assistance of the Investment Advisory Committee (IAC), a formal review of the strategic asset allocation by working with staff and ERS' consultant, Aon Hewitt Investment Company (AHIC), to conduct an Asset Allocation and Liability Study.

The first steps in this study are the completion of a risk survey that has been presented with the prior agenda item and capital market assumptions presented in this agenda item. Staff and AHIC discussed and agreed upon the following capital market projections to be presented to the Board and the Investment Advisory Committee (IAC). These long-term (10-year), forward-looking assumptions will be the basis of the Asset Allocation and Liability Study.

Following these presentations, staff and AHIC will present possible asset allocations to further discuss with the Board. The timeline below has been discussed during prior Board meetings and will follow the pace directed by the Board.

Asset Allocation Study	Dates	Completion Status
Orientation with staff and distribution of risk survey to Board and IAC	August - October 2016	Completed
Presentation of risk survey results; Presentation on macroeconomic view and capital market assumptions	December 2016 Board Meeting	Completed
Conduct Asset Allocation Working Session #1 - General Discussion	February 2017 Board Meeting	
Conduct Asset Allocation Working Session #2	May 2017 Board Meeting	
Conduct Asset Allocation Working Session #3	August 2017	
Conduct Asset Allocation Working Session #4	December 2017 Board Meeting	
Present Asset Allocation and Investment Policy Changes for Board Adoption	February 2018	

STAFF RECOMMENDATION:

This agenda item is provided for informational and discussion purposes only. No action is required.

ATTACHMENT – 1

Exhibit A – Employees Retirement System of Texas Asset Allocation and Liability Study Capital Market Assumptions

ERS

Public Agenda Item #2c

Review and Discussion of ERS' Asset Allocation Study

Capital Market Assumptions

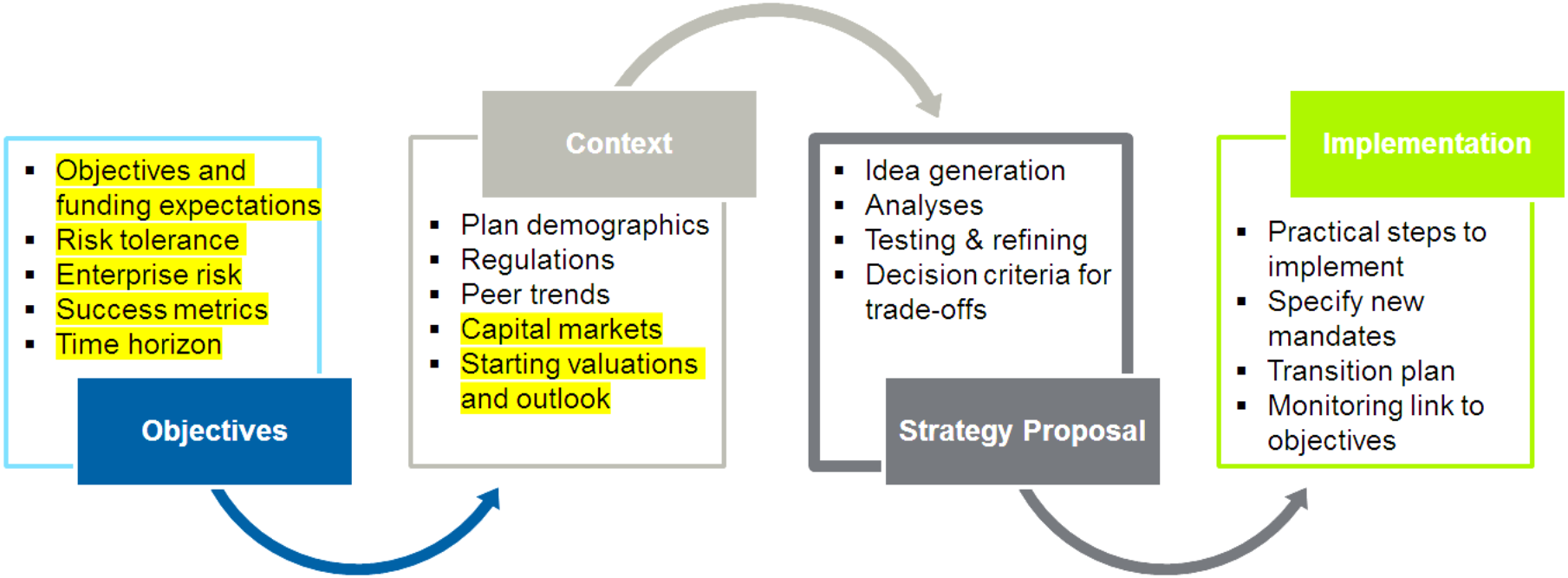
December 1, 2016

Tom Tull, CFA, Chief Investment Officer
Sharmila Kassam, CPA, Deputy Chief Investment Officer
Steve Voss and Kristen Doyle, Aon Hewitt

Agenda

- Review of Asset Liability Process
- Introduction of Capital Market Assumptions Methodology
- Review of Current Capital Market Assumptions
- Discussion on Presidential Elections
- Review of Asset Liability Process Timeline

Asset Liability Process Overview



Capital Market Assumption Method Alternatives

Method	Pros	Cons
Historical	▪ Based on true history of capital market events ▪ Readily explainable	▪ Generally a poor predictor of future outcomes ▪ Tends to project increased returns following outperformance and vice versa
Equilibrium (CAPM)	▪ Grounded in finance theory ▪ Transparent ▪ Consistent relationship between risk and return across asset classes	▪ Theory relies on assumptions that may not always hold ▪ Assumptions highly sensitive to inputs
Judgment-Driven	▪ Incorporates the knowledge and experience of the developer of the assumptions	▪ May not result in fully consistent return and risk assumptions ▪ Not fully transparent ▪ Not easily reproducible
Building Block	▪ Incorporates the primary drivers of return in each asset class ▪ Transparent ▪ Consistent relationship between risk and return across asset classes	▪ Generally assumes less-than-perfect market equilibrium ▪ More complex than other methods

Capital Market Assumptions

2012 Asset Liability Assumptions vs. 2016 Assumptions (10-Year)

		Policy	2012 AL Study		2016 Assumptions	
		Weight	Return	Risk	Return	Risk
Return Seeking Assets:		**79%**				
Global Equity		55%				
	Public Equity	45%	8.0%	21.0%	7.2%	18.5%
	Private Equity*	10%	10.0%	28.5%	9.3%	24.5%
Global Credit		10%				
	High Yield	10%	5.2%	14.0%	6.1%	12.0%
	Private Credit	0%	--	--	5.5%	9.5%
Real Assets		14%				
	Real Estate*	10%	8.0%	16.5%	7.5%	15.0%
	Infrastructure*	4%	8.7%	18.5%	7.0%	12.0%
Risk Reduction Assets:		**21%**				
Absolute Return		5%				
	Absolute Return Portfolio*	5%	5.6%	4.5%	5.0%	3.6%
Rates		15%				
	Intermediate Treasuries	15%	1.7%	2.0%	1.6%	2.0%
Cash		1%				
	Cash	1%	1.5%	1.0%	1.5%	1.0%
Inflation*			3.0%		2.5%	
Estimated Return (Nominal)			7.5%		6.8%	
Estimated Risk			12.9%		12.0%	
Sharpe Ratio			0.469		0.444	

*Custom assumption of ERS Staff and AHIC

Capital Market Assumptions

2012 Asset Liability Assumptions vs. 2016 Assumptions (10-Year)

Asset-Liability Process Update

Capital Market Assumptions (CMAs) – What Are They?

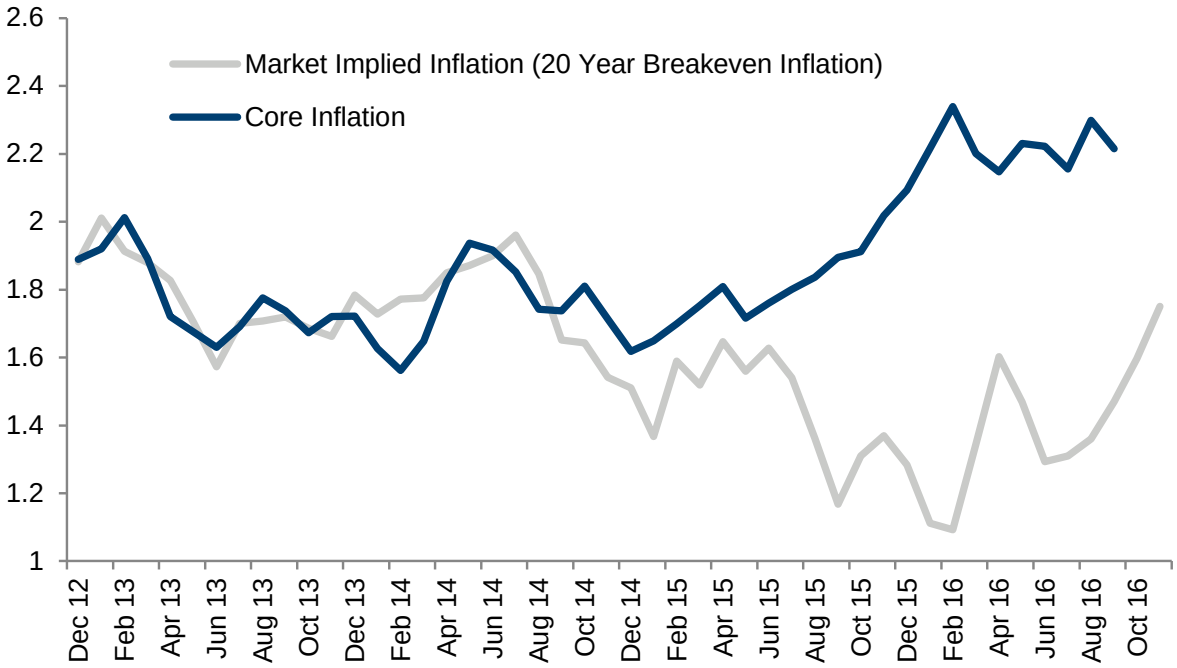
- Aon Hewitt's asset class return, volatility and correlation assumptions
- Long-term (10-year), forward-looking assumptions
  - These are separate from our Medium Term views
- Best estimates (50/50 probability of better or worse long-term results than expected)
- Market returns: no active management value added or fees (other than hedge funds and private equity, where traditional passive investments are not available)
- Produced quarterly by Global Asset Allocation Team

Asset-Liability Process Update

CMAs: Inflation

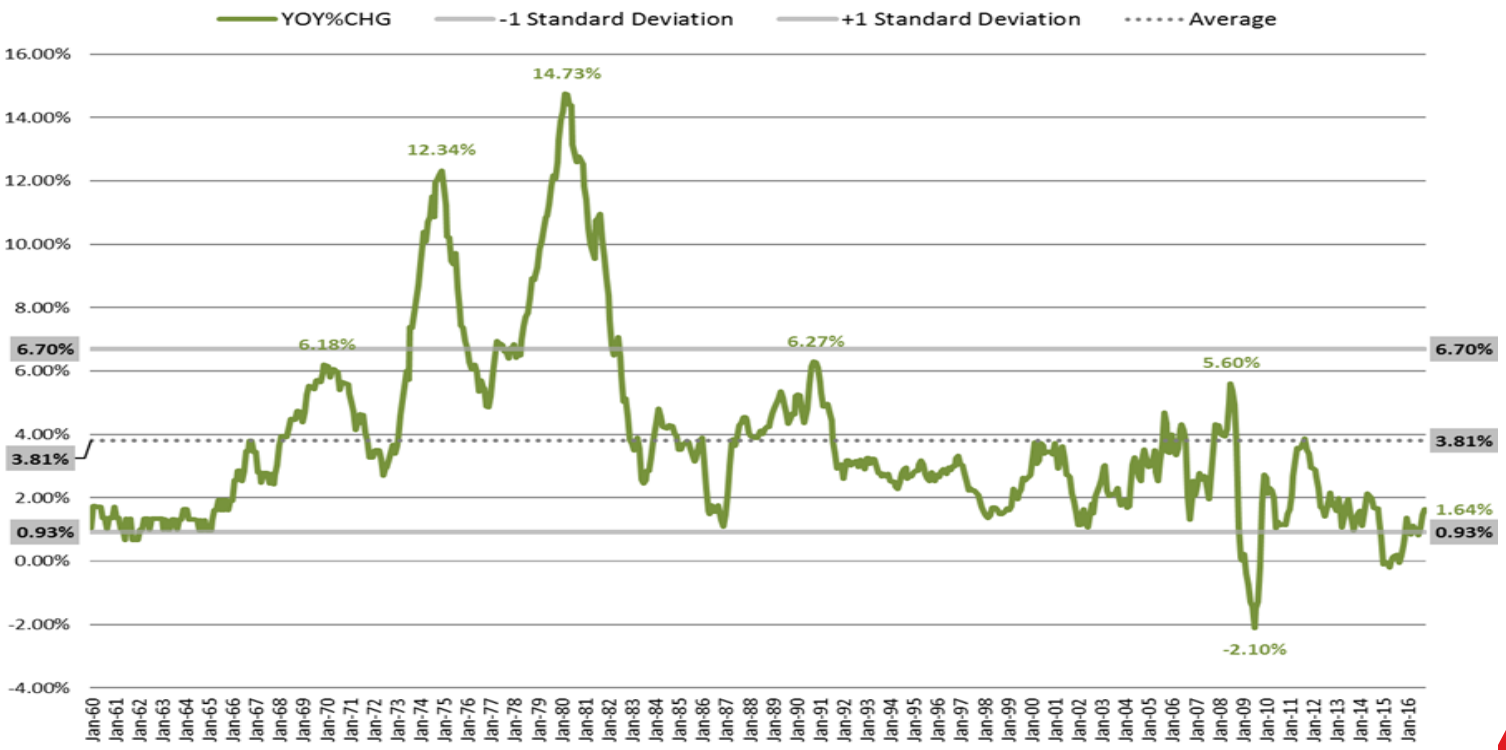
- Common approach is to use market implied break-even inflation rates (the difference between yields on nominal and inflation-linked government bonds of equivalent maturity or duration)
- We do not believe that Break-Even Inflation is a good estimator of future inflation
  - Break-even inflation = Expected Inflation + Inflation Risk Premium (IRP)
  - Inflation is a risk for many investors and therefore a premium is demanded to protect against it. Therefore, **we would expect IRP > 0** in the long-term
  - Break-even is affected by lots of things unrelated to inflation expectations
- Aon Hewitt Inflation assumption **based on consensus forecasts**
  - Principal source is Consensus Economics
  - Supplement with other sources (e.g., Philadelphia Fed)
- **Current Aon Hewitt 10-year Inflation forecast = 2.1%**
  - Unchanged from the level in the previous quarter (Q1 2016)

Break-Even Inflation vs. Core Inflation



- Break-even inflation is susceptible to market distortion as we have seen over the last couple of years.

Rolling 1-Year Non-Seasonally Adjusted All Urban Consumer Price Index



As of November 17, 2016

Incorporating Short & Long-Term Market Views

Our capital market assumptions incorporate the shorter term outlook in a number of different ways:

- Initial Yields: Most of our assumptions are built using a starting initial yield. To the extent that market pricing reflects short-term outlooks, our assumptions will capture this.

- Specific Economic Variables: Our growth (GDP and asset income growth) and inflation estimates incorporate the short term by combining it with our long-term steady state expectations. We weight long-term estimates more heavily than the short term.

Example Only – US Inflation

Year 1: 2.3%	+	Year 2: 2.3%	+	LT: 2.1%	=	10 Yr: 2.1%
Approx. 20% Weight				80% Weight		

Asset-Liability Process Update

CMAs: Equities

INCOME (Earnings Yield x Sustainable Payout Ratio) + **GROWTH** (Real EPS Growth) + **INFLATION** = **TOTAL** (Equity Return)

Earnings yield moves directly with market. Sustainable payout ratio is a constant and based on Aon Hewitt's assumptions

Based on Aon Hewitt's in-house trend analysis, I/B/E/S estimates and Consensus Economics

Based on consensus forecasts. Primary source is Consensus Economics

FORWARD LOOKING ASSUMPTION

Asset-Liability Process Update

CMAs: Government Bonds

- We **start from the current yield curve** for government bonds
- Using a simulation model, we combine the current yield curve with an assumption on the long-term behavior of the yield curve to **derive how yields are expected to evolve over time**
  - Dominant driver of government returns is what is priced into the yield curve
- **Total return assumptions** are then derived from the forward looking yield curves
- A similar methodology is followed for **inflation-linked bonds** but based on real yields and incorporating our inflation assumptions

Asset-Liability Process Update

CMAs: Corporate Bonds and Aggregate Index

- Corporate bond expected return is made up of three components: **Government yield, corporate spread, and expected losses from defaults and downgrades**
- All three are modeled using a wide range of simulation scenarios
- We assume that credit risk premiums revert over time from current levels to long-term historical averages
- Expected losses from defaults and downgrades are modeled using a forward-looking probability transition matrix*

Broad bond market returns are modeled as a combination of government and corporate bonds

* Based partly on historical default rates (Source: Moody's) and partly on Aon Hewitt's subjective views

Asset-Liability Process Update

CMAs: Real Estate

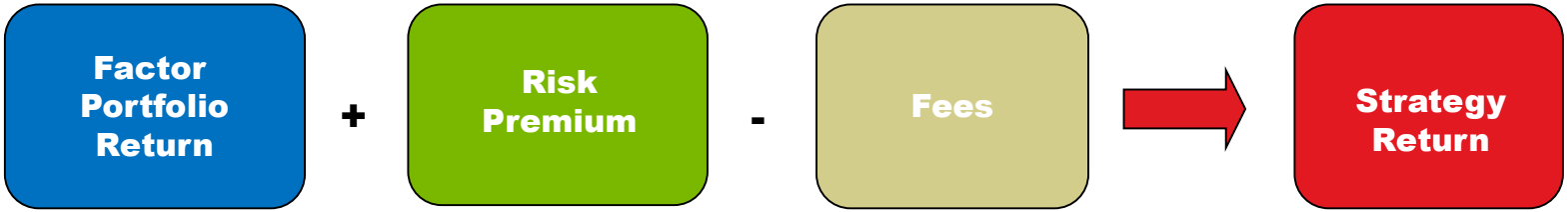
- Methodology similar to equities:

- Starting point is the **rental yield** each market is offering
- **Real rental growth** incorporates both a short term cyclical and long term aspect
  - We assume rents increase in line with consensus expectations over short term. In the long-term we assume rents grow in line with inflation
- Allow for unavoidable **costs** of direct real estate investment
- A real return assumption is calculated as the internal rate of return (IRR) of the projected cash flows **(discounted cash flow analysis similar to equities)**
- Nominal return is then calculated using our expected **inflation**
- **No manager alpha** as return assumption represents the real estate property market (and not real estate funds)

Asset-Liability Process Update

CMAs: Private Equity

- Return assumptions are **formulated for each strategy (sub-sector)** based on an analysis of the **exposure of each strategy to various market factors** with associated **risk premiums**
- Explicit **fee assumptions are subtracted** from expected returns; including base and performance-based fee/carry as appropriate
- Strategies include leveraged buyouts (LBOs), venture capital, mezzanine, and distressed investments



- Assumptions for a diversified (broad) private equity portfolio **is aggregation of assumptions for these underlying strategies**

Asset-Liability Process Update

CMAs: Hedge Funds

- Granular modeling of hedge funds at the individual hedge fund strategy level. Assumptions exist for 7 single-strategy hedge funds, Fund of Hedge Funds, and Broad Hedge Funds (diversified portfolio of direct hedge funds)
- Unlike most other asset classes, manager skill (**alpha**) is allowed. We also make allowance for **fees**
- Assumptions are developed in a three step process:
  - **"Beta" component** returns and risks formulated by **factor analysis**[1] of underlying building blocks of 7 individual hedge fund strategies. For example, equity long/short has net long position in equity markets
  - **"Alpha" component** returns and risks set with reference to **total future volatility levels** (of hedge fund strategy) **and information ratios**[2] (ratio of excess returns to excess volatility relative to a benchmark)
  - Explicit **fee assumptions are subtracted** from expected returns; including base and performance-based fee/carry as appropriate

[1] A multivariate regression analysis procedure to identify exposures to different factors. Hedge Fund strategy returns are used as dependent variable and asset class returns are used as the independent variables

[2] Incorporates both historical analysis and Aon Hewitt's forward-looking views of information ratios relative to factor portfolios

Asset-Liability Process Update

CMAs: Infrastructure

Initial Yield + Inflation + **Capital Growth** x **Leverage** - **Debt Financing Costs** - **Fees** - **Taxes** = **Infrastructure Return**

- Returns are formulated using a cash flow based approach that projects cash flows on a diversified portfolio of assets over a 10 year period, using IRR method
- We assume **income (initial yield)** that grows at inflation over the 10 year period
- **Capital** is assumed to grow in line with inflation
- **Leverage** is assumed at 55%
- **Debt financing costs** are set at market interest rates with appropriate credit spreads (no refinancing is assumed)
- **Fees** are assumed to be fund level – 1.5% management fee + 20% performance fee payable over 8% hurdle rate
- **Taxes** are assumed to be the standard U.S. corporate tax rate of 35%
  - While infrastructure funds will be structured tax efficiently, the earnings of project companies will be taxable

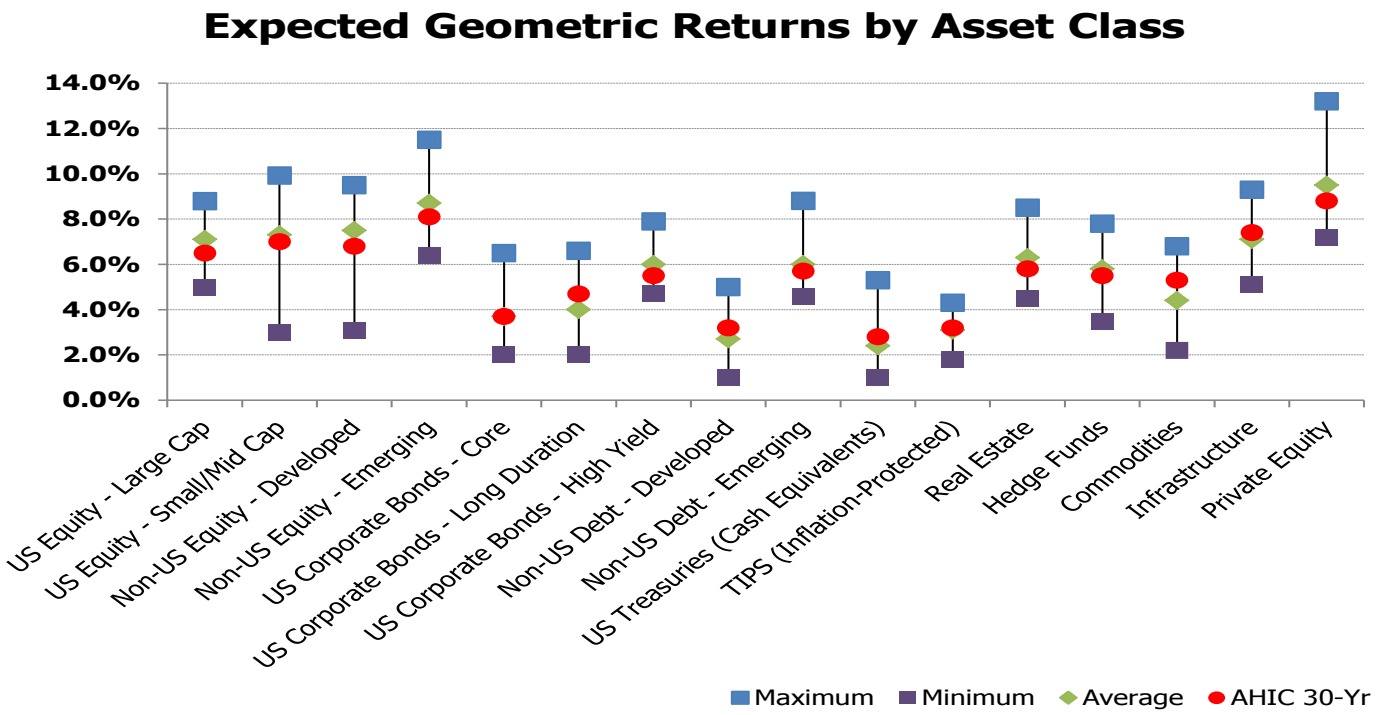
Asset-Liability Process Update

CMAs: Volatility and Correlation

- We take a **forward-looking view** when setting volatility assumptions as opposed to using purely historic averages. The credit crisis demonstrated the dangers of relying solely on historical values
- We consider:
  - **Implied volatilities** priced into option contracts of various terms
  - **Historical volatility** levels
  - The broad **economic/market environment**
- We assume that **volatilities are not constant over time**; we assume that the volatility of "risky" asset classes such as equities will be at historically high levels in the next few years before declining over time
- For illiquid asset classes such as real estate, desmoothing techniques are employed when assessing historic volatility levels
- Correlation assumptions are formulated with reference to historic experience over different time periods and during different economic conditions
  - We take into account the fact that **correlations are highly unstable over time** and, in particular, we take into account the fact that correlations are very different in stressed environments

Asset-Liability Process Update

CMAs: AHIC Versus Peers (2015 Horizon Survey)



SOURCE: Horizon Actuarial survey of 2015 capital market assumptions from 29 independent investment advisors
Expected returns of the survey are annualized over 10-20 years (geometric). Returns are 'blended,' using 10-year assumptions when 20-year assumptions are not available. AHIC expected returns are annualized over 30-years.

Recent Presidential Election Results: Key things to watch

Tax and spending plans:

- The bipartisan think tank, The Committee for a Responsible Federal Budget, has estimated that President-Elect Trump's tax and spending plans will add $5.3trn to the national debt over 10 years. The main proposals of these plans include a simplification of the personal income tax rules, which will result in a significant tax cut for wealthy individuals, a reform of business taxes and $450bn of extra defense spending. The reform or repeal of the Affordable Care Act could be an offset and add to the US budget.
- These estimates are forecast to increase US debt as a percentage of GDP to 105% by 2026 but, crucially, this number does not include any adjustment to GDP growth as a result of the boost from tax cuts and defense spending.
- There will be many arguments about the likely boost and it will depend on the actual details of the policies enacted. We will comment on these projections further as more information comes in over the coming months.
- **Nonetheless, the markets have decided, at least initially, that the fiscal position of the government will worsen, implying a greater supply of Treasuries over time, thus reducing their attraction.**

The opinions referenced are as of the date of publication and are subject to change due to changes in the market or economic conditions and may not necessarily come to pass. Information contained herein is for informational purposes only and should not be considered investment advice.
Past performance is not a guarantee of future results.

What now? Key things to watch

Trade and Immigration:

- President-Elect Trump has been highly skeptical regarding free trade deals and immigration, stating that he would be much more inward looking and would reject or repeal many of the current deals, such as NAFTA or the Trans-Pacific Partnership.
- Economic theory overwhelmingly suggests that less free trade results in lower GDP growth over time and if trade restrictions are adopted, global growth will be weaker. Against that, if fiscal stimulus is delivered, there is a partial offset to the broader growth impact.
- Again, we will need to see actual policies before taking a view on this and, while the Republican party controls Congress, many of them are in favor of free trade (and conservative fiscal policies), so it is not necessarily true that protectionist (or fiscally expansionary) policies will come into law easily. We will have to wait and see. **For the time being, the possibility of trade and migration restrictions is being interpreted negatively for Mexico and China.**

The Federal Reserve and Monetary Policy:

- Federal Reserve Chair, Janet Yellen, may not be reappointed when her 4 year term ends in February 2018. In the meantime, it is unclear what the short term economic impact will be and **we still expect an interest rate increase in the mid-December meeting, but the risk of a delay has also risen. This would provide a boost to markets in the short term.**

The opinions referenced are as of the date of publication and are subject to change due to changes in the market or economic conditions and may not necessarily come to pass. Information contained herein is for informational purposes only and should not be considered investment advice.
Past performance is not a guarantee of future results.

Portfolio Considerations

- Political and policy uncertainty is generally higher
- We believe higher uncertainty will be reflected in risk premiums for asset classes
- Greater policy uncertainty is an added reason why our broad asset class views have become more cautious after Brexit and US elections
- Policy shifts that might follow are still very unclear, actual market impact over time is still not particularly predictable
- Diversified portfolios that have managed the risks from different economic scenarios sufficiently remain our recommended approach
- **We will review capital market assumptions as we have more certainty about the new administration**

Asset Liability Process Overview

Asset Allocation Study	Dates	Completion Status
Orientation with staff and distribution of risk survey to Board and IAC	August - October 2016	Presented
Presentation of risk survey results; Presentation on macroeconomic view and capital market assumptions	December 2016 Board Meeting	Presented
Conduct Asset Allocation Working Session #1 - General Discussion	February 2017 Board Meeting	
Conduct Asset Allocation Working Session #2	May 2017 Board Meeting	
Conduct Asset Allocation Working Session #3	August 2017 Board Meeting	
Conduct Asset Allocation Working Session #4	December 2017 Board Meeting	
Present Asset Allocation and Investment Policy Changes for Board Consideration	February 2018 Board Meeting	

Appendix

Equity Return Assumption

	U.S. (2)	U.K.	Europe ex U.K.	Japan	Canada	Switzerland	Emerging Markets
Earnings Yield * Sustainable Payout Ratio	2.8%	3.2%	3.3%	3.2%	3.1%	3.0%	3.0%
Real Earnings Growth	1.9	1.8	1.6	1.6	1.9	1.7	2.2
Inflation	2.1	1.9	1.6	1.4	2.0	1.1	2.3
Methodological Differences(1)	-0.3	-0.1	0.0	-0.1	-0.1	0.0	0.0
Current Nominal Return Assumption (Local Currency)	**6.5%**	**6.8%**	**6.6%**	**6.1%**	**6.9%**	**5.8%**	**7.6%**

- Current EAFE return in US dollar = 7.5%, Global Equity return in US dollar = 7.2%

(1) Aon Hewitt model is a Discounted Cash Flow (DCF) model, not an additive building block model
(2) Represents Large Cap

Intermediate (5-year Duration) Government Bond Return Assumption

Return Component*	Q2 2016	
Initial Yield	1.3%	Prevailing market yield
Capital Gain/Loss	-0.1%	Projected yield increase results in projected capital losses. Long Duration bonds suffer larger losses than short
Increase/Decrease in Yield (Income)	0.5%	Projected yield increases leads to ability to reinvest at higher yields in future
Roll Return	0.2%	Roll return on rebalancing has a positive impact on the return assumption
Total 10-Year Return Assumption	**1.7%**	

* Components do not sum perfectly to the total because of rounding and because they are medians, which are not additive.

Intermediate (5-year Duration; AA Rated) Corporate Bond Return Assumption

Return Component*	Q2 2016	
Intermediate Gov't Bond Return	1.7%	See previous slides
Initial Spread	0.7%	Prevailing spread
Increase/Decrease due to Spread	0.1%	Spreads are assumed to revert to fair value in the long run. (Projected) narrowing/widening of credit spreads results in decline/increase of income
Capital Gain/Loss (from spread)	0.1%	(Projected) narrowing/widening of credit spreads results in projected capital gain/loss
Roll Return	0.4%	When yield curve slopes upward, as bonds approach maturity, yields fall and prices rise. Flatter yield curve reduces this beneficial effect.
Defaults & Downgrades	-0.3%	Expected default and downgrade losses depend on the probability of a bond defaulting or being downgraded, and will vary over time
Total 10-Year Return Assumption	**2.8%**	

* Components do not sum perfectly to the total because they are medians, which are not additive. All figures are rounded.

High Yield Debt Return Assumption(update)

- Methodology similar to corporate bonds
- We assume that the long-term average default rate is 4.0%
  - Calculated using annual default rates (for BB, B, CCC-) over 1990-2007 (covering the period when market was well developed but prior to the default spike that took place during the credit crisis)
  - Recovery rate is assumed to be 40%

Expected Return*	**Q2 2016**
5 Year Treasury Return	1.7%
Spread	6.9%
Default/Downgrade Losses	-2.6%
Total 10-Year Return Assumption	**6.1%**

* Components do not sum perfectly to the total because they are medians, which are not additive. All figures are rounded.

Real Estate Return Assumption

Core	Q2 2016
Rental Yield	5.1%
Real Rental Growth	0.3
Management Costs	-2.0
Inflation	2.1
Total 10-Year Return Assumption	**5.5%**

Total Market	Q2 2016
Rental Yield	5.7%
Real Rental Growth	0.4
Management Costs	-2.0
Inflation	2.1
Total 10-Year Return Assumption	**6.2%**

Real Estate Return Assumption (cont.)

	AHIC Weights	ERS Weights
Strategy Breakdown:		
Core	75%	30%
Non-Core	25%	40%
REITs	--	30%
Regional Breakdown:		
U.S.	100%	70%
Non-U.S.	0%	30%
Total Private Equity	**100%**	**100%**

- Customized ERS assumption is higher than AHIC's forward-looking assumption for real estate primarily due to a higher expected allocation to non-core assets and higher target for international real estate exposure

Private Equity Return Assumption

Strategy	U.S. Large Cap Equity	U.S. Small Cap Equity	U.S. High Yield
Venture Capital	--	100%	--
LBOs	100%*	--	--
Distressed Debt	50%	--	50%
Mezzanine	25%	--	75%

	AHIC Weights	AHIC Expected Returns	ERS Weights	ERS Expected Returns
Venture Capital	24%	10.5%	13%	12.0%
Buyouts (LBOs)	54%	7.5%	46%	9.5%
Distressed Debt	16%	9.9%	7%	7.5%
Mezzanine	6%	9.8%	3%	6.0%
Natural Resources	0%	--	8%	10.5%
Secondaries	0%	--	23%	7.8%
Total Private Equity	**100%**	**8.8%**	**100%**	**9.3%**

- Customized ERS assumption is higher than AHIC's forward-looking assumption for private equity primarily due to higher expected returns for venture capital and buyouts given the types of strategies Staff is investing in, and incorporating an allocation to natural resources
- Both sets of assumptions included an expectation for international exposure to both developed non-U.S. and emerging markets

* 60% leverage is assumed

Infrastructure Return Assumption

Expected Return	Q2 2016
Initial Yield	6.1%
Inflation	2.1%
Capital Growth	2.1%
Return Before Leverage	**10.3%**
Return Including Leverage of 55%	**16.0%**
Debt Financing Costs (Interest rate x Leverage)	-3.6%
Management Fees	-1.5%
Return Before Taxes	**10.9%**
Taxes (35%)	-3.8%
Total 10-Year Return Assumption	**6.7%**

- Customized ERS assumption is higher than AHIC's forward-looking assumption for infrastructure primarily due to a higher expected allocation to non-core assets and higher target for emerging market exposure

Hedge Funds/Absolute Return Portfolio

Albourne Weighted Avg Expected Return	Recent Model Weights	Strategy	Model Weighted Return Expectations
5.4%	10.0%	Global Macro	0.54%
5.0%	11.0%	CTA	0.55%
4.9%	11.0%	Fundamental Equity Market Neutral	0.54%
4.6%	6.0%	Statistical Arbitrage	0.28%
4.5%	6.0%	Fixed Income Arbitrage	0.27%
4.5%	7.0%	Insurance	0.32%
4.4%	5.0%	Convertible Bond Arbitrage	0.22%
3.8%	10.0%	Quantitative Market Neutral	0.38%
3.7%	5.0%	Structured Credit RV	0.19%
3.7%	2.0%	GAA	0.07%
3.0%	7.0%	US Equity Long/Short	0.21%
3.0%	5.0%	Risk Arbitrage	0.15%
3.0%	2.0%	Europe Equity Long/Short	0.06%
2.9%	2.0%	Japan Equity Long/Short	0.06%
2.8%	2.0%	Asia Pacific Long/Short	0.06%
2.4%	5.0%	Distressed	0.12%
2.4%	0.0%	Emerging Markets Fixed Income	0.00%
1.9%	4.0%	Relative Value Credit	0.08%
1.8%	0.0%	Activitst	0.00%
1.3%	0.0%	Emerging Markets Long/Short	0.00%

Hedge Fund Expected Return	4.08%
Manager Selection	1.00%
Total Return Expectation	5.08%

- Customized ERS assumption based on expectations for the expectations of the Absolute Return Portfolio

Asset-Liability Process Update

CMAs Q2 2016: Expected Nominal Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1	Large Cap U.S. Equity	1.00	0.92	0.95	0.79	0.72	0.08	0.08	-0.06	0.06	-0.01	0.09	-0.11	0.62	0.43	-0.03	-0.02	0.02	0.44	0.41	0.48	0.72	0.59	0.71	0.59	0.40	0.39	0.66	0.31	0.69	0.38	0.05	0.59	0.91	0.49
2	Small Cap U.S. Equity		1.00	0.88	0.73	0.67	0.07	0.07	-0.06	0.05	-0.01	0.08	-0.11	0.58	0.40	-0.02	-0.02	0.01	0.40	0.38	0.42	0.66	0.54	0.65	0.54	0.38	0.36	0.61	0.27	0.64	0.36	0.04	0.54	0.84	0.44
3	Global Equity			1.00	0.92	0.84	0.07	0.07	-0.05	0.07	0.00	0.09	-0.11	0.68	0.45	0.17	0.16	0.02	0.49	0.46	0.58	0.69	0.58	0.69	0.57	0.41	0.39	0.64	0.38	0.66	0.37	0.07	0.65	0.87	0.46
4	International Equity				1.00	0.75	0.04	0.04	-0.04	0.06	0.00	0.08	-0.09	0.60	0.40	0.41	0.36	0.00	0.44	0.43	0.61	0.60	0.50	0.59	0.49	0.37	0.36	0.54	0.42	0.56	0.32	0.08	0.61	0.73	0.38
5	Emerging Markets Equity					1.00	0.06	0.06	-0.04	0.07	0.01	0.09	-0.10	0.68	0.39	0.19	0.17	0.03	0.50	0.47	0.54	0.52	0.43	0.51	0.42	0.34	0.32	0.49	0.30	0.53	0.30	0.06	0.63	0.66	0.35
6	Gov Cash						1.00	0.99	0.45	0.50	0.22	0.19	0.24	0.14	0.04	0.14	0.32	0.66	0.16	0.08	0.00	-0.03	-0.03	-0.03	-0.03	0.14	0.15	0.08	0.22	0.09	0.11	0.54	0.00	-0.01	-0.03
7	LIBOR Cash							1.00	0.45	0.50	0.22	0.19	0.24	0.14	0.05	0.14	0.31	0.65	0.16	0.08	0.01	-0.03	-0.03	-0.03	-0.03	0.13	0.15	0.08	0.22	0.09	0.11	0.53	0.10	0.17	0.36
8	TIPS								1.00	0.46	0.25	0.22	0.27	0.09	-0.08	0.08	0.14	0.25	0.12	0.03	-0.03	-0.12	-0.10	-0.12	-0.10	0.01	0.02	-0.03	0.18	-0.04	0.00	0.42	0.02	-0.01	0.12
9	Core Fixed Income (Market Duration)									1.00	0.84	0.85	0.75	0.33	0.09	0.20	0.36	0.64	0.49	0.22	0.12	0.05	0.04	0.05	0.04	0.08	0.09	0.06	0.08	0.06	0.06	0.17	0.26	0.11	0.20
10	Long Duration Bonds – Gov't / Credit										1.00	0.96	0.95	0.14	-0.11	0.18	0.31	0.52	0.37	0.11	0.06	-0.04	-0.03	-0.04	-0.03	0.02	0.02	0.00	-0.02	0.00	0.01	-0.08	0.09	0.02	0.07
11	Long Duration Bonds – Credit											1.00	0.83	0.35	0.13	0.17	0.30	0.50	0.51	0.24	0.15	0.13	0.11	0.13	0.11	0.06	0.06	0.06	0.00	0.07	0.05	-0.07	0.29	0.10	0.11
12	Long Duration Bonds – Gov't												1.00	-0.12	-0.38	0.17	0.30	0.50	0.16	-0.04	-0.06	-0.23	-0.19	-0.23	-0.19	-0.03	-0.03	-0.07	-0.03	-0.09	-0.04	-0.08	-0.16	-0.08	0.03
13	High Yield Bonds													1.00	0.73	0.19	0.20	0.13	0.73	0.62	0.57	0.65	0.54	0.65	0.53	0.28	0.27	0.42	0.38	0.47	0.27	0.19	0.90	0.58	0.33
14	Bank Loans														1.00	0.08	0.08	0.03	0.41	0.54	0.43	0.69	0.57	0.68	0.56	0.19	0.18	0.29	0.17	0.31	0.19	0.09	0.79	0.40	0.21
15	Non-US Developed Bond (0% Hedged)															1.00	0.96	0.30	0.22	0.21	0.51	0.02	0.02	0.02	0.02	0.01	0.01	-0.02	0.43	0.00	0.02	0.15	0.28	-0.01	0.03
16	Non-US Developed Bond (50% Hedged)																1.00	0.56	0.27	0.22	0.46	0.01	0.01	0.01	0.01	0.03	0.03	-0.01	0.40	0.01	0.03	0.21	0.28	0.02	0.10
17	Non-US Developed Bond (100% Hedged)																	1.00	0.27	0.12	0.07	-0.02	-0.02	-0.02	-0.02	0.07	0.08	0.03	0.11	0.02	0.06	0.26	0.12	0.08	0.23
18	Hard Emerging Market Bonds																		1.00	0.70	0.61	0.53	0.44	0.52	0.43	0.20	0.20	0.30	0.21	0.32	0.19	0.09	0.75	0.42	0.26
19	Corporate Emerging Market Bonds																			1.00	0.60	0.57	0.47	0.57	0.47	0.17	0.17	0.27	0.25	0.28	0.17	0.08	0.73	0.38	0.22
20	Local Emerging Market Bonds																				1.00	0.49	0.41	0.49	0.41	0.12	0.11	0.29	0.44	0.20	0.13	0.02	0.74	0.42	0.22
21	Hedge Funds Universe																					1.00	0.77	0.99	0.76	0.28	0.27	0.47	0.28	0.49	0.27	0.02	0.70	0.66	0.32
22	Hedge Funds Buy List																						1.00	0.76	0.99	0.23	0.22	0.39	0.22	0.41	0.23	0.01	0.58	0.54	0.26
23	Broad Hedge Funds - without fees (Universe)																							1.00	0.75	0.28	0.27	0.46	0.27	0.48	0.27	0.02	0.69	0.65	0.32
24	Broad Hedge Funds - without fees (BuyList)																								1.00	0.23	0.22	0.39	0.22	0.40	0.23	0.01	0.57	0.54	0.26
25	Real Estate																									1.00	0.96	0.49	0.08	0.35	0.20	0.08	0.24	0.40	0.22
26	Core Real Estate																										1.00	0.47	0.08	0.33	0.20	0.09	0.23	0.38	0.22
27	REITs																											1.00	0.19	0.47	0.26	0.05	0.39	0.61	0.33
28	Commodities																												1.00	0.11	0.08	0.42	0.37	0.29	0.22
29	Private Equity																													1.00	0.32	0.05	0.39	0.65	0.34
30	Infrastructure																														1.00	0.06	0.24	0.37	0.22
31	Inflation																															1.00	0.13	0.09	0.20
32	Multi Asset Credit																																1.00	0.54	0.30
33	Equity Insurance Risk Premium- High Beta																																	1.00	0.48
34	Equity Insurance Risk Premium- Low Beta																																		1.00

Asset-Liability Process Update

CMAs: AHIC Versus Peers (2015 Horizon Survey) (continued)

	Horizon Survey				AHIC			
	Expected Geometric Returns			Expected Risk	10 Year Forecasts		30 Year Forecasts	
Asset Class	**Maximum**	**Minimum**	**Average**	**Average**	**Expected Return**	**Expected Risk**	**Expected Return**	**Expected Risk**
US Equity - Large Cap	8.8%	5.0%	7.1%	17.1%	6.5%	17.0%	6.5%	17.5%
US Equity - Small/Mid Cap	9.9%	3.0%	7.3%	21.0%	6.7%	23.0%	7.0%	23.5%
Non-US Equity - Developed	9.5%	3.1%	7.5%	19.6%	6.9%	20.0%	6.8%	20.5%
Non-US Equity - Emerging	11.5%	6.4%	8.7%	26.6%	8.0%	30.0%	8.1%	30.5%
US Fixed Income - Core	6.5%	2.0%	3.7%	5.6%	2.9%	4.0%	3.7%	5.0%
US Fixed Income - Long Duration Corp	6.6%	2.0%	4.0%	10.8%	4.4%	11.5%	4.7%	13.5%
US Fixed Income - High Yield	7.9%	4.7%	6.0%	11.2%	4.7%	12.0%	5.5%	12.0%
Non-US Fixed Income - Developed	5.0%	1.0%	2.7%	7.4%	2.3%	5.5%	3.2%	6.5%
Non-US Fixed Income - Emerging	8.8%	4.6%	6.0%	11.7%	4.6%	13.0%	5.7%	13.5%
Treasuries (Cash Equivalents)	5.3%	1.0%	2.4%	2.8%	2.1%	1.0%	2.8%	1.5%
TIPS (Inflation-Protected)	4.3%	1.8%	3.1%	6.3%	2.7%	4.5%	3.2%	4.5%
Real Estate	8.5%	4.5%	6.3%	13.6%	5.8%	11.5%	5.8%	11.5%
Hedge Funds	7.8%	3.5%	5.8%	8.3%	5.0%	9.0%	5.5%	10.0%
Commodities	6.8%	2.2%	4.4%	18.0%	4.5%	17.0%	5.3%	17.0%
Infrastructure	9.3%	5.1%	7.1%	13.1%	7.2%	14.5%	7.4%	14.5%
Private Equity	13.2%	7.2%	9.5%	23.6%	8.8%	24.0%	8.8%	24.5%
Inflation	2.8	1.7	2.2%	1.8%	2.1%	1.0%	2.1%	1.5%

Notes (Horizon Survey):
Source: Horizon Actuarial survey of 2015 capital market assumptions from 29 independent investment advisors
Expected returns are annualized over 10-20 years (geometric). Returns are 'blended,' using 10-year assumptions when 20-year assumptions are not available.

Notes (AHIC Forecasts):
AHIC Forecasts are for Q3 2015
US Equity - Small/Mid Cap forecasts represents AHIC forecasts for US Small Cap
US Fixed Income - Long Duration forecasts represents AHIC forecasts for Long Duration Credit
Non-US Fixed Income - Developed forecasts represents AHIC forecasts for Non-US Fixed Income - Developed (50% Hedged)
Non-US Fixed Income- Emerging forecasts represents AHIC forecasts for Non-US Fixed Income- Emerging Sovereign USD
Real Estate forecasts represents AHIC forecasts for Core Private Real Estate
Hedge Funds forecasts represents AHIC forecasts for Hedge Fund-of-Funds

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PUBLIC AGENDA ITEM -#3*

3. Discussion and Training Regarding Ethics and Fiduciary Responsibility

December 1, 2016

BACKGROUND:

The ERS Personnel Policy and Procedure Manual (Personnel Manual) requires employees to perform their duties in an ethical manner. Employees Retirement System of Texas (ERS) staff and management work diligently to maintain and promote an ethical work environment. Employees are encouraged to discuss issues with their supervisors or Human Resources or go directly to the Deputy Executive Director & General Counsel who serves as the ERS Ethics Officer. Employees may also use the ERS Intranet site to anonymously report any alleged ethics violations. All reports will be reviewed by the Deputy Executive Director & General Counsel, the Director of Human Resources and the Director of Internal Audit.

In the Survey of Employee Engagement recently completed by ERS staff, survey responses reflect staff's belief that:

- Employees at all levels of ERS are held accountable for adhering to ethical standards,
- Employees feel comfortable reporting ethics violations,
- Employees feel that ERS leadership regularly shows that it cares about ethical issues and concerns, and
- Employees demonstrate high ethical standards in their work.

In addition, all ERS staff are required to complete annual ethics training. The ERS Investment Policy requires all members of the ERS Board of Trustees and the Investment Advisory Committee, as well as certain ERS investment-related staff to receive ethics training annually.

The ethics and fiduciary training this year will be presented by Kelley Bender, partner with the Chapman and Cutler law firm.

STAFF RECOMMENDATION:

This agenda item is provided for informational and discussion purposes only. No action is required.

** We are accredited by the State Pension Review Board (PRB) as a Minimum Educational Training (MET) sponsor for Texas public retirement systems. This accreditation does not constitute an endorsement by the PRB as to the quality of our MET program. These agenda items may be considered in-house training provided by ERS to board trustees and the system administrator for purposes of fulfilling the MET program requirements. ERS is an accredited sponsor of MET for its system administrator and trustees.*

PUBLIC AGENDA ITEM - # *4**

4. Review and Discussion of ERS Retirement Plans and Actuarial Valuation Reports for Funding as of August 31, 2016

December 1, 2016

BACKGROUND:

Section 815.206 of the Texas Government Code requires an actuary, as designated by the Board of Trustees (Board) to perform annual valuations of the assets and liabilities of the Employees Retirement System of Texas' (the System) retirement funds. The System's consulting actuary for retirement benefits, Gabriel Roeder Smith & Company (GRS), has completed the actuarial valuation of the assets and liabilities of:

- The Employees Retirement System Fund (ERS);
- The Law Enforcement and Custodial Officers Supplemental Retirement Fund (LECOSRF); and
- The Judicial Retirement System Plan Two (JRS2).

A limited actuarial valuation is performed for the Judicial Retirement System Plan One (JRS1) because it is not pre-funded on an actuarial basis, but rather is funded on a pay-as-you-go basis. Therefore, many of the typical actuarial metrics provided for the other three plans do not apply to JRS 1.

The valuations take into account all promised benefits to which all members, regardless of their retirement status, of the respective funds are entitled to as of August 31, 2016. The valuations are based on the demographic and economic actuarial assumptions adopted by the board on February 26, 2013 and reflect the increases in ERS and JRS1 in contribution rates that began September 1, 2015.

Summary Comparison of the Retirement Actuarial Valuations
August 31, 2016

Highlights of the Actuarial Valuation Results for Pre-funded Plans (as of August 31, 2016)			
	ERS	**LECOSRF**	**JRS 2**
Actuarial Accrued Liability	$35.3 B	$1,312.4 M	$425.9 M
Actuarial Value of Assets	$26.6 B	$933.5 M	$395.5 M
Unfunded Liability	$8.7 B	$378.9 M	$30.4 M
Funded Ratio	75.2%	71.1%	92.9%
Funding Period	35	Infinite	49

Due to changes made by House Bill 1 and House Bill 9 during the 2015 legislative session, the outlook for the ERS plan significantly improved. The ERS plan is by far the largest of the plans administered by the agency.

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ERS FUND

	FY End 2016	FY End 2015	Difference
Actuarial Metrics			
Accrued Liability	$35.3 B	$33.9 B	$1.4 B
Actuarial Value of Assets	$26.6 B	$25.9 B	$0.7 B
Unfunded Liability	$8.7 B	$8.0 B	$0.7 B
Funded Ratio	75.2%	76.3%	(1.1%)
Funding Period	35	33	2
Normal Cost Rate	12.28%	12.27%	0.01%
Actuarially Sound Contribution (ASC) Rate	19.88%	19.62%	0.26%
Contribution Rates	**FY 2017**	**FY 2016**	**Difference**
State	9.50%	9.50%	No change
Agency	0.50%	0.50%	No change
Member	9.50%	9.50%	No change
Total Contribution Rate	19.50%	19.50%	No change
Contribution Shortfall	(0.38%)	(0.12%)	0.26%

ERS contributions, which are set by the Texas Legislature (the plan sponsor), are based on a level percent of payroll and are not adjusted each year based on actuarial need, although the Legislature will consider the most recent valuations when making its biennial appropriations.

Since September 1, 2015, the ERS Fund has been receiving significantly higher state and member contributions than prior years, totaling 19.5%. This amount is slightly under the ASC rate calculated for FY 2016, but it is enough to pay off the unfunded liabilities over the long term. However, in the short term, the 19.5% is not quite enough to pay off the interest accruing on the current unfunded liability, so the expectation is that the unfunded liability will increase. We expect this trend to occur over a 10-15 year period before reversing.

Between 2015 and 2016, the funded ratio decreased by 1.1%, the funding period increased by 2 years, the unfunded liability increased by $0.7 billion, and the ASC rate increased by 0.26%. The increase in the funding period and the ASC rate between the two years is due to unrecognized losses on the actuarial value of assets.

LECOSRF and JRS2 Plans Unsound

In addition, both LECOSRF and JRS2 (the agency's other pre-funded retirement plans) are still considered actuarially unsound. This means that current contribution rates are not enough to pay off the unfunded liability within soundness guidelines. The LECOSRF fund has an infinite funding period, which means that it will never have enough funds to pay the benefits at the current funding levels and the funds will eventually deplete. The contributions are meeting the normal cost rate (base benefit cost) plus some towards the unfunded liability, but contributions need to increase in each plan for them to be considered actuarially sound and prevent fund depletion.

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LAW ENFORCEMENT AND CUSTODIAL OFFICERS SUPPLEMENTAL RETIREMENT FUND (LECOSRF)

	FY End 2016	FY End 2015	Difference
Actuarial Metrics			
Accrued Liability	$1,312.4 M	$1,262.3 M	$50.1 M
Actuarial Value of Assets	$933.5 M	$909.2 M	$24.3 M
Unfunded Liability	$378.9 M	$353.1 M	$25.8 M
Funded Ratio	71.1%	72.0%	(0.9%)
Funding Period	Infinite	Infinite	No change
Normal Cost Rate	1.81%	1.77%	0.04%
Actuarially Sound Contribution (ASC) Rate	3.10%	3.01%	0.09%
Contribution Rates	**FY 2017**	**FY 2016**	**Difference**
State	0.50%	0.50%	No change
Court Cost Revenue*	1.10%	1.20%	(0.10%)
Member	0.50%	0.50%	No change
Total Contribution Rate	2.10%	2.20%	No change
Contribution Shortfall	(1.0%)	(0.81%)	0.19%

**The annual court fees contributed to LECOSRF are expected to remain level in the future. As a result, the equivalent contribution rate is expected to decrease over time as the payroll increases. Over a 31-year period, this amount is expected to be equivalent to 0.77% of payroll, but for FY 2017 only is estimated at 1.10% of payroll.*

Between 2015 and 2016, the funded ratio decreased by 0.9%, the funding period of infinite remained unchanged, the unfunded liability increased by $25.8 million, and the ASC rate increased by 0.09%.

While prior benefit changes and contribution increases from 2009 and 2013 did improve the funding status of LECORSF, further contribution increases - either through lump sums or as an ongoing annual percent of payroll - are needed to make the fund solvent over the long term.

JUDICIAL RETIREMENT SYSTEM, PLAN TWO (JRS 2)

	FY End 2016	FY End 2015	Difference
Actuarial Metrics			
Accrued Liability	$425.9 M	$404.0 M	$21.9 M
Actuarial Value of Assets	$395.5 M	$372.6 M	$22.9 M
Unfunded Liability	$30.4 M	$31.4 M	($1.0 M)
Funded Ratio	92.9%	92.2%	0.7%
Funding Period	49	Infinite	Finite
Normal Cost Rate	21.18%	21.40%	(0.22%)
Actuarially Sound Contribution (ASC) Rate	23.48%	23.79%	(0.31%)
Contribution Rates	**FY 2017**	**FY 2016**	**Difference**
State	15.663%	15.663%	No change
Member*	7.44%	7.16%	0.28%
Total Contribution Rate	23.103%	22.823%	0.28%
Contribution Shortfall	(0.377)%	(0.967%)	(0.59%)

**In JRS 2, the member rate reflected is the effective member rate. Judges in JRS 2 have the option to discontinue earning service (and therefore, cease contributions) after 20 years of service (or 12 years, if an appellate court justice). The member rate for those contributing was 7.20% for FY 2016 and is 7.50% for FY 2017, but the effective rates are slightly lower since some members choose not to participate.*

For JRS 2, between 2015 and 2016, the funded ratio increased by 0.7%, the funding period of infinite was reduced to a finite period of 49 years, the unfunded liability decreased by $1.0 million, and the ASC rate decreased by 0.31%. From fiscal 2015 to 2016, the member rate increased from 7.2% to 7.5%, where it is scheduled to remain. It should be noted that the member contributions between JRS 1 and 2 are different; JRS 1 member contributions are linked to the employee class of ERS, so JRS 1 members pay 9.5%

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rather than 7.5%. The funding status of JRS 2 has been on the edge of finite/infinite for several years. Even the smallest deviations in plan experience can cause a seemingly significant funding trend changes for the plan. With the 2016 valuation, JRS 2 had very favorable demographic experience because far fewer active members retired than was expected (34 retirements expected versus 4 actual retirements). Given the small population in JRS 2, the retirement experience was significant enough to favorably improve the funding metrics for 2016.

However, over the long term, the JRS 2 member contribution rates will likely need to increase to match member rates in JRS 1 and ERS to continue the positive trend and improvement in funding status.

Demographic, salary and benefit information as of August 31, 2016 is summarized in the following table:

Demographic Summary Results from the Actuarial Valuations as of August 31, 2016				
	ERS State Employees Elected Officials District Attorneys	**LECOSRF** Law Enforcement & Custodial Officers (DPS, TABC, TPWD, TDCJ)	**JRS 2** Judges, justices and certain court commissioners (after 9/1/85)	**JRS 1** *(Closed Plan)* Judges, justices and certain court commissioners (prior to 9/1/85)
Members (current and terminated employees)				
Active Members	146,390	39,066	548	10
Average Age (as of 8/31/16)	43.3	41.0	57.4	69.8
Average Entry Age	34.8	33.0	47.3	39.8
Average Years of Service	8.5	8.0	10.1	30.0
Average Annual Salary	$ 46,495	$ 44,634	$ 142,770	$147,000
Inactive members – vested	16,597	95	16	0
Inactive member – non-vested	92,276	15,108	150	2
Annuitants				
Retirees and beneficiaries	103,758	11,515	331	374
Service Retirements	93,050	10,748	294	250
Disability Retirements	2,396	102	2	0
Beneficiaries	8,312	665	35	124
Average Age (as of 8/31/16)*	68.5	62.2	69.0	78.8
Average Age at Retirement*	58.3	54.0	62.5	61.6
Average Years of Service*	22.2	23.7	15.1	18.1
Average Annual Annuity	$ 19,668	$ 5,304	$ 63,455	$ 67,016

** Annuitant demographics are based only on Service Retirements.*

The actuarial valuation reports are presented with this agenda item under separate covers as Exhibits A-D and include detailed financial results, membership data and summaries of the benefits and actuarial assumptions used to prepare the valuations.

STAFF RECOMMENDATION:

ATTACHMENTS – 4 (Exhibits A-D under separate cover)

Exhibit A – ERS Actuarial Valuation for Fiscal Year Ending, as of August 31, 2016

Exhibit B – LECOSRF Actuarial Valuation for Fiscal Year Ending, as of August 31, 2016

Exhibit C – JRS 2 Actuarial Valuation for Fiscal Year Ending, as of August 31, 2016

Exhibit D – JRS1 Actuarial Valuation for Fiscal Year Ending, as of August 31, 2016

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GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

EMPLOYEES RETIREMENT SYSTEM OF TEXAS

ANNUAL ACTUARIAL VALUATION – FUNDING

AS OF AUGUST 31, 2016

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November 17, 2016

Board of Trustees
Employees Retirement System of Texas
200 East 18th Street
Austin, TX 78701

Re: Actuarial Valuation for Funding Purposes as of August 31, 2016

Members of the Board:

We certify that the information contained in this report is accurate and fairly presents the actuarial position of the Employees Retirement System of Texas (ERS) as of August 31, 2016. This report was prepared at the request of the Board and is intended for use by ERS staff and those designated or approved by the Board. This report may be provided to parties other than ERS only in its entirety and only with the permission of the Board.

Actuarial Valuation

The primary purposes of the actuarial valuation report are to determine the adequacy of the current State and employer contribution rates, describe the current financial condition of ERS, analyze changes in the condition of ERS, and provide various summaries of the data.

Plan Provisions

Our actuarial valuation as of August 31, 2016 reflects the benefit and contribution provisions set forth in Chapters 811 through 815 of the Texas Government Code. The current plan provisions are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. Additionally, this actuarial valuation incorporates the most significant across-the-board pay increases budgeted by the State Legislature for the current biennium. The current actuarial assumptions and methods are outlined in Appendix II of this report.

Data

The valuation was based upon information as of August 31, 2016, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not

otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of, where applicable, the Internal Revenue Code and ERISA.

The signing actuaries are independent of the plan sponsor. They are all Enrolled Actuaries, Fellows of the Society of Actuaries, and Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, each of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

R. Ryan Falls, FSA, EA, MAAA
Senior Consultant

Joseph P. Newton, FSA, EA, MAAA
Senior Consultant

Dana Woolfrey, FSA, EA, MAAA
Consultant

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SECTION A

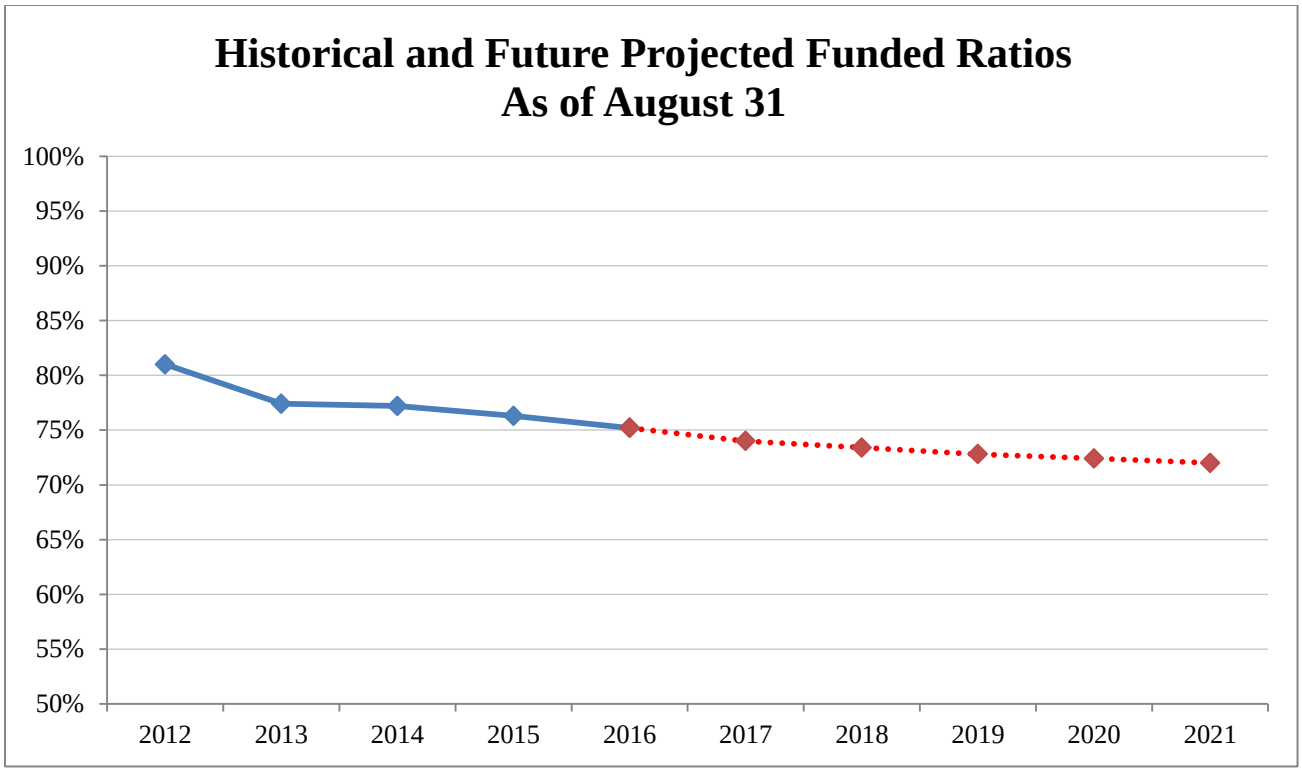
EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Item	2016	2015
Membership		
• Number of		
- Active members*	146,390	142,409
- Retirees and beneficiaries	103,758	100,003
- Inactive, vested	16,597	16,673
- Inactive, nonvested	92,276	84,449
- Total	359,021	343,534
• Valuation Payroll	$ 6,806,457,317	$ 6,659,646,892
Statutory contribution rates	FY 2017	FY 2016
• Members	9.50%	9.50%
• Employers	0.50%	0.50%
• State	9.50%	9.50%
Actuarially Sound Rate (funds normal cost and amortizes unfunded accrued liability over 31 years, per Section 811.006 of the Texas Government Code)	19.88%	19.62%
Assets		
• Market value (MVA)	$ 24,465,580,124	$ 23,998,481,161
• Actuarial value (AVA)	$ 26,557,130,705	$ 25,850,542,024
• Return on market value*	5.3%	0.5%
• Return on actuarial value	5.9%	6.1%
Actuarial Information on AVA (smoothed)		
• Normal cost %	12.28%	12.27%
• Total normal cost	$ 835,832,959	$ 817,138,674
• Actuarial accrued liability	$ 35,303,165,362	$ 33,868,359,950
• Unfunded actuarial accrued liability (UAAL)	$ 8,746,034,657	$ 8,017,817,926
• Funded ratio	75.2%	76.3%
• Funding period (years)	35	33
Actuarial Information on MVA		
• Unfunded actuarial accrued liability (UAAL)	$ 10,837,585,238	$ 9,869,878,789
• Funded ratio	69.3%	70.9%
• Funding period (years)	73	59

* Provided by ERS Master Trust Custodian

The following chart illustrates the recent history and outlook of the funded status of ERS over the next five years:



August 31,	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Funded Ratio	81.0%	77.4%	77.2%	76.3%	75.2%	74.0%	73.4%	72.8%	72.4%	71.9%
UAAL (in billions)	$5.7	$7.2	$7.5	$8.0	$8.7	$9.5	$10.0	$10.6	$11.1	$11.6
ASC	18.25%	18.73%	18.76%	19.62%	19.88%	20.17%	20.35%	20.47%	20.58%	20.64%

The projections beyond 2016 are based on the same assumptions, methods and provisions used for the August 31, 2016 valuation, which include the most significant across-the-board pay increases budgeted by the State Legislature and the assumptions adopted by the Board in February 2013. Additionally, the market value of assets is expected to earn 8% per year.

The funding trajectory of ERS deteriorated slightly based on the actuarial value of assets and on a market basis. This is primarily due to asset losses, both on a market and actuarial basis. Assuming the market value of assets earns 8% per year, ERS is projected to reach full funding in 2089. Assuming the actuarial (smoothed) value of assets earns 8% per year, ERS is projected to reach full funding in 2051.

It is important to note that the short-term projections of funded ratio, UAAL and actuarially sound contribution (ASC) rate show a downward drift. This is caused by the $2.1 billion of deferred asset losses in the actuarial value of assets that will be systematically recognized over the coming years (20% of the outstanding amount each year).

SECTION B

DISCUSSION

DISCUSSION

Introduction

The results of the August 31, 2016 actuarial valuation of the Employees Retirement System of Texas (ERS) are presented in this report.

The primary purposes of this actuarial valuation report are to determine the adequacy of the current State and employer contribution rates, describe the current financial condition of ERS, analyze the changes in the condition of ERS, and provide various summaries of the data.

The total contribution rate for the current fiscal year exceeds the normal cost by 7.22% of payroll, which, on an actuarial value of assets basis, is sufficient to amortize the unfunded liability over 35 years. On a market value basis, the total contribution rate is sufficient to amortize the unfunded liability over 73 years. This was a step back from the August 31, 2015 valuation, primarily due to asset losses during fiscal year 2016, both on a market and actuarial value basis.

All of the tables referenced in the following discussion appear in Section C of this report.

Plan Provisions

There were no changes to the plan provisions during the past year. The current plan provisions are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. We did not perform an independent analysis of the actuarial assumptions. We believe the assumptions are internally consistent and are reasonable, based on the actual experience of ERS.

The actuarial valuation as of August 31, 2016 incorporates the most significant across-the-board pay increases budgeted by the State Legislature for the current biennium. Specifically, all regular class employees were assumed to receive no across-the-board increase on September 1, 2016. CPO/COs covered by State of Texas Salary Schedule C were assumed to receive increases in accordance with the schedule (which generally result in no increase on September 1, 2016). Finally, CPO/COs employed by the Texas Department of Criminal Justice were assumed to receive no across-the-board increase on September 1, 2016.

The results of the actuarial valuation are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated

contribution rates and funding periods. A review of the impact of a different set of assumptions on the funded status of ERS is outside the scope of this actuarial valuation.

The current actuarial assumptions and methods are outlined in Appendix II of this report.

Funding Adequacy

The funding objective of ERS is to fund the sum of the normal cost and the amount necessary to amortize any unfunded actuarial accrued liability over a period that does not exceed 30 years by one or more years. Contribution rates should be established which, over time, will remain level as a percent of payroll.

The member contribution rates are established by State statute and the State contribution rate is set by State statute and legislative appropriation. Members contribute 9.50% of payroll and the State is scheduled to contribute 10.00% of payroll (9.50% from statewide appropriations and 0.50% from agency appropriations) for each year in the future based on appropriations for the current biennium and expectations regarding future biennia. The long-term State contribution rates are subject to future legislative appropriations.

The unfunded actuarial accrued liability (UAAL) of ERS increased from $8.0 billion as of August 31, 2015 to $8.7 billion as of August 31, 2016. Additionally, the funded ratio of ERS—actuarial value of assets divided by the actuarial accrued liability—decreased from 76.3% to 75.2% as of August 31, 2016. This decrease was primarily due to the losses on the actuarial value of assets during fiscal year 2016. The funded status is one of many metrics used to show trends and develop future expectations about the health of a retirement system. The funded status measure itself is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions since it does not reflect normal cost contributions, the timing of amortization payments, or future experience other than expected.

The valuation shows that the total normal cost for funding purposes is 12.28% of payroll. The total contribution rate is currently 19.50% of payroll. Thus, the total contribution rate for the current fiscal year exceeds the normal cost by 7.22% of payroll, which is sufficient to amortize the unfunded liability over 35 years on an actuarial value of assets basis.

The determination of the funding period anticipates growth in the contributory payroll in accordance the actuarial assumptions. Accordingly, the anticipated contributions that will be used to eliminate the UAAL are expected to increase over time. As a result, the amortization payments will not be sufficient to cover all of the interest charges on the UAAL (i.e., the UAAL is expected to increase each year) until the funding period reaches approximately 20 years, or less.

Section 811.006 of the Texas Government Code limits the modifications to ERS that would, essentially, increase benefits or lower contributions to the trust unless the current level of benefits and contributions are considered actuarially sound. Section 811.006 defines actuarially sound as a

retirement system that is receiving a total contribution rate sufficient to cover the normal cost, administrative expenses, and amortize the UAAL over a period of 31 years, or less. Based on the actuarial valuation as of August 31, 2016, the actuarially sound contribution (ASC) rate for ERS is 19.88% of payroll.

As noted, the ASC is currently calculated based on a 31-year open amortization period. This means that the ASC contribution will always be calculated with the same 31-year period and the UAAL would never completely disappear. Even though the contributions to ERS are not based on this ASC, the Board may want to consider adopting a funding policy that includes an ultimate goal of eliminating the UAAL by a certain date. This type of funding policy will allow the Board to better assess the level of contributions received from the employers and the State.

System Assets

This report contains several tables that summarize key information with respect to the ERS assets.

The total market value of assets increased from $24.0 billion to $24.5 billion as of August 31, 2016. Table 5 reconciles the changes in the fund during the year. Total contributions increased from $963 million to $1,361 million, due to an increase in active member payroll and an increase in the total contribution rate from 14.90% to 19.50% of pay.

Table 6 shows the development of the actuarial value of assets. Rather than use the ERS' market value of assets, the valuation reflects a smoothed asset value. This actuarial value is calculated by immediately reflecting 20% of the difference between the expected actuarial value and the current market value. The actuarial value is currently 8.5% more than the market value.

The approximate investment return for the fiscal year ending August 31, 2016 was 5.3% when measured on market value and 5.9% when measured on actuarial value. Table 7 shows a history of return rates. The ERS ten-year average market return, net of investment expenses as reported by the ERS Master Trust Custodian, is 5.8%.

Table 8 provides a history of the contributions paid into ERS and the administrative expenses and benefit payments that have been paid out of ERS. This table shows that ERS paid administrative expenses and benefit payments, in excess of contributions received, of $1,109 million (or 4.6% of assets) in fiscal year 2015 and that amount was $806 million (or 3.3% of assets) in fiscal year 2016. The scheduled increases in contribution rates should continue to mitigate the growth in this deficit; however, ERS should continue to monitor this deficit as it could impact the future liquidity needs of ERS.

Data

The valuation was based upon information as of August 31, 2016, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not

otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

The tables in Appendix III show key census statistics for the various groups included in the valuation.

SECTION C

TABLES

Development of Employer Cost

	August 31, 2016	August 31, 2015
1. Payroll		
a. Reported Payroll (August Payroll of Active Members)	$ 6,806,457,317	$ 6,406,986,436
b. Valuation Payroll (Expected Covered Payroll for Following Plan Year)	6,806,457,317	6,659,646,892
2. Total Normal Cost Rate		
a. Gross normal cost rate	12.03%	12.02%
b. Administrative expenses	0.25%	0.25%
c. Total (Item 2a + Item 2b)	12.28%	12.27%
3. Actuarial Accrued Liability for Active Members		
a. Present value of future benefits for active members	$ 20,307,684,320	$ 19,516,915,605
b. Less: present value of future normal costs	(5,429,877,061)	(5,077,477,179)
c. Actuarial accrued liability	$ 14,877,807,259	$ 14,439,438,426
4. Total Actuarial Accrued Liability for:		
a. Retirees and beneficiaries	$ 19,017,977,910	$ 18,080,000,823
b. Inactive members	1,407,380,193	1,348,920,701
c. Active members (Item 3c)	14,877,807,259	14,439,438,426
d. Total	$ 35,303,165,362	$ 33,868,359,950
5. Actuarial Value of Assets	$ 26,557,130,705	$ 25,850,542,024
6. Unfunded Actuarial Accrued Liability (UAAL) (Item 4d - Item 5)	$ 8,746,034,657	$ 8,017,817,926
7. Amortization of UAAL Over 31 Years as a Level Percentage of Payroll	7.60%	7.35%
8. Contribution Rate Needed to Fund Normal Cost Plus Amortize the UAAL Over 31 Years (Item 2c + Item 7)	19.88%	19.62%
9. Allocation of Contribution Rate		
a. Combined State and employer rates	10.00%	10.00%
b. Member rate	9.50%	9.50%
c. Total contribution rate	19.50%	19.50%
d. Total normal cost rate	12.28%	12.27%
e. Available contribution rate to amortize UAAL	7.22%	7.23%
f. Total contribution rate	19.50%	19.50%
10. Funding period based on statutory contribution rates and Actuarial Value of Assets (years)	35	33

Actuarial Present Value of Future Benefits

		August 31, 2016	August 31, 2015
1.	Active Members		
	a. Service Retirement	$ 18,497,623,991	$ 17,852,126,502
	b. Disability Benefits	289,378,636	270,809,826
	c. Death Before Retirement	305,729,174	292,430,946
	d. Termination	1,214,952,519	1,101,548,331
	e. Total	$ 20,307,684,320	$ 19,516,915,605
2.	Inactive Members	$ 1,407,380,193	$ 1,348,920,701
3.	Annuitants	$ 19,017,977,910	$ 18,080,000,823
4.	Total Actuarial Present Value of Future Benefits	$ 40,733,042,423	$ 38,945,837,129

Analysis of Normal Cost

		August 31, 2016	August 31, 2015
1.	Gross Normal Cost Rate		
	a. Service Retirement	8.63%	8.63%
	b. Disability Benefits	0.28%	0.28%
	c. Death Before Retirement	0.24%	0.24%
	d. Termination	2.88%	2.87%
	e. Total	12.03%	12.02%
2.	Administrative Expenses	0.25%	0.25%
3.	Total Normal Cost	12.28%	12.27%
4.	Less: Member Rate	9.50%	9.50%
5.	Employer Normal Cost Rate	2.78%	2.77%

Historical Summary of Active Member Data

	Active Members		Covered Payroll		Average Salary			
Valuation as of August 31,	Number	Percent Increase	Amount in $ Millions	Percent Increase	$ Amount	Percent Increase	Average Age	Average Service
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2008	134,626	N/A	5,313	N/A	39,468	N/A	43.7	9.4
2009	141,223	4.9%	5,677	6.8%	40,202	1.9%	43.6	9.2
2010	142,490	0.9%	5,845	3.0%	41,022	2.0%	43.8	9.2
2011	137,293	-3.6%	5,714	-2.2%	41,620	1.5%	44.1	9.5
2012	132,669	-3.4%	5,597	-2.0%	42,188	1.4%	44.3	9.7
2013	133,669	0.8%	5,689	1.7%	42,564	0.9%	44.3	9.6
2014	134,162	0.4%	5,953	4.6%	44,374	4.3%	44.3	9.4
2015	142,409	6.1%	6,407	7.6%	44,990	1.4%	43.6	8.8
2016	146,390	2.8%	6,806	6.2%	46,495	3.3%	43.3	8.5

Reconciliation of Plan Net Assets

	Year Ending	
	August 31, 2016	August 31, 2015
	(1)	(2)
1. Market value of assets at beginning of year	$ 23,998,481,161	$ 25,050,116,469
2. Revenue for the year		
a. Contributions for the year		
i. State (including membership fees)	$ 686,763,354	$ 500,394,986
ii. Member (including penalty interest)	674,677,886	462,159,534
iii. Total	$ 1,361,441,240	$ 962,554,520
b. Net investment income	$ 1,273,413,421	$ 56,940,707
c. Total revenue	$ 2,634,854,661	$ 1,019,495,227
3. Disbursements for the year		
a. Benefit payments and refunds	2,215,784,680	$ 2,114,361,254
b. Net transfers from TRS	(68,477,651)	(65,070,345)
c. Administrative expenses	20,448,669	21,839,626
d. Total expenditures	2,167,755,698	2,071,130,535
4. Increase in net assets (Item 2c - Item 3d)	$ 467,098,963	$ (1,051,635,308)
5. Market value of assets at end of year (Item 1 + Item 4)	$ 24,465,580,124	$ 23,998,481,161

Development of Actuarial Value of Assets

	Year Ending August 31, 2016
1. Actuarial value of assets at beginning of year	$ 25,850,542,024
2. Net new investments	
a. Contributions for the year (Table 5)	$ 1,361,441,240
b. Disbursements for the year (Table 5)	(2,167,755,698)
c. Subtotal	(806,314,458)
3. Assumed investment return rate	8.00%
4. Expected return	$ 2,035,790,784
5. Expected actuarial value of assets at end of year (Item 1 + Item 2c + Item 4)	$ 27,080,018,350
6. Market value of assets at end of year	$ 24,465,580,124
7. Excess earnings/(shortfall) (Item 6 - Item 5)	$ (2,614,438,226)
8. Excess earnings/(shortfall) recognized (20% x Item 7)	$ (522,887,645)
9. Actuarial value of assets (Item 5 + Item 8)	$ 26,557,130,705
10. Estimated rate of return	5.9%
11. Actuarial value as percentage of market value	108.5%

History of Investment Return Rates

Year Ending August 31 of	Market*	Actuarial
(1)	(2)	(3)
2003	9.2%	5.4%
2004	11.7%	6.4%
2005	12.7%	7.5%
2006	8.8%	7.7%
2007	13.9%	8.6%
2008	-4.6%	5.7%
2009	-6.6%	3.2%
2010	6.7%	3.6%
2011	12.6%	5.0%
2012	8.2%	5.4%
2013	10.1%	6.1%
2014	14.7%	7.6%
2015	0.5%	6.1%
2016	5.3%	5.9%
Average Returns		
Last Five Years:	7.7%	6.2%
Last Ten Years:	5.8%	5.7%

* Market Value Rates of Return provided by the ERS Master Trust Custodian.

History of Cash Flow

Year Ending August 31, (1)	Contributions (2)	Distributions and Expenditures: Benefit Payments and Refunds (3)	Distributions and Expenditures: Administrative Expenses (5)	Distributions and Expenditures: Total (6)	External Cash Flow for the Year (7)	Market Value of Assets (8)	External Cash Flow as Percent of Market Value (9)
2007	$ 657.7	$ (1,333.2)	$ (16.0)	$ (1,349.2)	$ (691.5)	$ 23,480	-2.9%
2008	678.8	(1,383.9)	(16.2)	(1,400.1)	(721.3)	21,464	-3.4%
2009	716.1	(1,449.0)	(17.3)	(1,466.3)	(750.2)	19,098	-3.9%
2010	810.4	(1,512.4)	(19.0)	(1,531.4)	(721.0)	19,581	-3.7%
2011	839.9	(1,612.5)	(18.8)	(1,631.3)	(791.4)	21,204	-3.7%
2012	758.1	(1,733.7)	(17.8)	(1,751.5)	(993.4)	21,826	-4.6%
2013	798.3	(1,834.4)	(18.7)	(1,853.1)	(1,054.8)	22,869	-4.6%
2014	912.8	(1,963.5)	(20.2)	(1,983.7)	(1,070.9)	25,050	-4.3%
2015	962.6	(2,049.3)	(21.8)	(2,071.1)	(1,108.5)	23,998	-4.6%
2016	1,361.4	(2,147.3)	(20.4)	(2,167.7)	(806.3)	24,466	-3.3%

Dollar amounts in millions

Column (7) = Column (2) + Column (6).

Total Experience Gain or Loss

Item		Year Ending August 31, 2016	Year Ending August 31, 2015
(1)		(2)	(3)
A. Calculation of total actuarial gain or loss			
1. Unfunded actuarial accrued liability (UAAL), previous year		$ 8,017,817,926	$ 7,492,814,715
2. Normal cost for the year (excluding administrative expenses)		800,489,556	699,224,514
3. Actual administrative expenses		20,448,669	21,839,626
4. Contributions for the year (excluding service purchases)		(1,321,742,138)	(917,406,260)
5. Interest at 8%			
a. On UAAL		$ 641,425,434	$ 599,425,177
b. On normal cost and administrative expenses		32,837,529	28,842,566
c. On contributions		(52,869,686)	(36,696,250)
d. Total		$ 621,393,277	$ 591,571,493
6. Assumption change (Gains)/Losses		$ 0	$ 0
7. Legislative changes		0	(384,148,839)
8. Expected UAAL (Sum of Items 1 through 7)		8,138,407,290	7,503,895,249
9. Actual UAAL		8,746,034,657	8,017,817,926
10. Total (gain)/loss for the year (Item 9 - Item 8)		$ 607,627,367	$ 513,922,677
B. Source of gains and losses	% of AAL		
11. Asset (Gain)/Loss for the year	1.48%	$ 522,887,645	$ 463,015,216
12. Pay Increases (Less)/Greater than Expected	0.11%	39,084,397	(42,302,470)
13. Non-Retired Demographic (Gains)/Losses	0.03%	(9,121,228)	14,287,972
14. Post-Retirement Mortality (Gains)/Losses	0.06%	19,613,169	19,746,718
15. Other Demographic (Gains)/Losses	0.10%	35,163,384	59,175,241
16. Total (Sum of Items 11 through 15)	1.72%	$ 607,627,367	$ 513,922,677

Solvency Test

Actuarial Accrued Liability and Percent of Active Member Payroll for:

	Accumulated Member Contributions Including Interest		Retirees and Beneficiaries Currently Receiving Benefits		Employer Financed Portion of Vested and Nonvested Benefits			Portion of Accrued Liabilities Covered by Assets		
August 31,	(1)	% of Payroll	(2)	% of Payroll	(3)	% of Payroll	Actuarial Value of Assets	(1)	(2)	(3)
2007	$ 4,059.7	77%	$11,519.9	219%	$ 8,407.5	160%	$ 22,938.9	100%	100%	88%
2008	4,256.2	79%	12,195.8	227%	8,951.2	166%	23,511.9	100%	100%	79%
2009	4,460.6	77%	12,648.2	218%	9,799.0	169%	23,509.6	100%	100%	65%
2010	4,719.7	80%	13,407.8	226%	10,284.3	173%	23,628.6	100%	100%	54%
2011	4,943.7	85%	14,325.2	247%	9,781.3	169%	23,997.4	100%	100%	48%
2012	5,075.2	89%	15,244.0	269%	9,658.0	170%	24,272.5	100%	100%	41%
2013	5,201.0	91%	16,148.2	284%	10,536.8	185%	24,667.6	100%	100%	31%
2014	5,213.6	88%	17,113.9	287%	10,597.2	178%	25,431.9	100%	100%	29%
2015	5,235.1	82%	18,080.0	282%	10,553.3	165%	25,850.5	100%	100%	24%
2016	5,509.4	81%	19,018.0	279%	10,775.8	158%	26,557.1	100%	100%	19%

Note : Dollar amounts in millions

APPENDICES

SUMMARY OF PLAN PROVISIONS FOR EMPLOYEES RETIREMENT SYSTEM OF TEXAS

Classes of Membership

1. Elected Class Membership:
    a. Membership is optional and limited to:
        i. Elected State officials not covered by either of the Judicial Retirement Systems
        ii. Members of the Legislature; and
        iii. District and Criminal District Attorneys paid by the State general revenue fund.
2. Employee Class Membership:
    a. Membership is mandatory for all employees and appointed officers of every department, commission, board, agency, or institution of the State except for:
        i. Independent contractors;
        ii. Persons covered by the Teacher Retirement System or either of the Judicial Retirement Systems; and
        iii. Employee Class Members already receiving retirement benefits under the System.
    b. Includes two types of Employee Class service:
        i. CPO/CO: Certified Peace Officer / Custodial Officer – in general, service rendered while a law enforcement officer, custodial officer, parole officer or caseworker; and
        ii. Regular: Non-CPO/CO service.
    c. Prior to September 1, 2015, membership begins after a 90-day waiting period. Effective September 1, 2015, membership begins immediately.

Member Contributions

1. Elected Class:
    a. *Legislators*:
        i. *Fiscal year 2015:* 8.00% of compensation
        ii. *Fiscal year 2016 and beyond:* 9.50% of compensation
    b. *Non-legislators*:
        i. *Fiscal year 2015:* 6.90% of compensation
        ii. *Fiscal year 2016 and beyond:* 9.50% of compensation. Beginning in fiscal year 2018, the 9.50% will be reduced one-tenth of one percent for each one-tenth of one percent that the State contribution rate for the fiscal year to which the service relates is less than the State contribution rate established for the 2017 fiscal year.

2. Employee Class:
   a. *Fiscal year 2015*: 6.90% of compensation
   b. *Fiscal year 2016 and beyond*: 9.50% of compensation. Beginning in fiscal year 2018, the 9.50% will be reduced one-tenth of one percent for each one-tenth of one percent that the State contribution rate for the fiscal year to which the service relates is less than the State contribution rate established for the 2017 fiscal year.
   c. Additional member contributions may be allowable for service purchases.
3. Member contributions cease when a member's benefit accrual has reached 100% of Average Monthly Compensation.
4. Member contributions accumulate interest at 5.00% per year through December 31, 2013 and 2.00% interest per year, thereafter.

State of Texas and Employer Contributions

State and employer contributions are set biennially by the legislature. The current projected contribution rates, as a percentage of compensation, are shown below. In addition, the State makes contributions for lump-sum death benefits, establishing service not previously established, and annual membership fees. State payroll contributions cease when a member's benefit accrual has reached 100% of Average Monthly Compensation.

	FY2015	**FY2016**	**FY2017 and beyond**
Employer (agency appropriations)	0.50%	0.50%	0.50%
State (statewide appropriations)	7.50%	9.50%	9.50%

State contributions after the 2017 fiscal year are subject to future legislative appropriations.

Return to Work Surcharge

For members who, on or after September 1, 2009, retire from the employee class and are rehired as a retiree into a position that would otherwise include membership in the employee class, the department or agency that employs the member must remit to the retirement system an amount equal to the amount of the State contribution that the department or agency would remit for an active member employed in the person's position.

Compensation

Compensation includes base salary, longevity and hazardous duty pay and excludes overtime pay. This amount is limited by Section 401(a)(17) of the Internal Revenue Code for members hired after August 31, 1996.

Average Monthly Compensation (AMC)

1. Elected Class Service: The State salary, excluding longevity pay, of a district judge, as adjusted from time to time.
2. Employee Class Service:
    a. *Members hired prior to September 1, 2009*: Average of the 36 highest months of compensation for service in the employee class of membership
    b. *Members hired on or after September 1, 2009 and prior to September 1, 2013*: Average of the 48 highest months of compensation for service in the employee class of membership
    c. *Members hired on or after September 1, 2013*: Average of the 60 highest months of compensation for service in the employee class of membership

Creditable Service

The types of service creditable in ERS are membership service, military service and equivalent membership service. Equivalent membership service includes: previously cancelled service, service not previously established, waiting period service, and Additional Service Credit.

Unused Sick and Annual Leave

In many cases, unused sick and annual leave can be used to establish Creditable Service. Members hired prior to September 1, 2009 can use unused sick and annual leave to satisfy service requirements for Retirement and Death Benefit Plan eligibility as well as to calculate plan benefits. Members hired on or after September 1, 2009 can only use unused sick and annual leave to calculate plan benefits. However, members hired on or after September 1, 2013 cannot use unused annual leave to calculate plan benefits if the member opts to receive the unused annual leave as a lump-sum payment. Elected Class service is not granted for unused sick and annual leave.

Standard Service Retirement Annuity

1. Elected Class:
    a. *Eligibility*:
        i. Age 60 and eight years of elected class service; or
        ii. Age 50 and 12 years of elected class service.
    b. *Benefits:* 2.3% of AMC times years of Creditable Service, adjusted automatically based on the State salary of a district judge. Alternatively, an elected class member may elect to transfer their elected class service to the employee class in order to have their AMC based on actual compensation. However, if the elected service is transferred to the employee class, the member forfeits increases based on changes in the State salary of a district judge unless the service is transferred back to the elected class.

2. Employee Class:
   a. *Eligibility*:
      i. Members hired prior to September 1, 2009: Age 60 with five years of employee class service;
      ii. Members hired on or after September 1, 2009: Age 65 with 10 years of employee class service;
      iii. Five years of service and age plus employee class service is at least 80 (Rule of 80)
      iv. Age 55 with 10 years of CPO/CO service
      v. Any age with 20 years of CPO/CO service
   b. *Benefits:* 2.3% of AMC times years of Creditable Service
   c. *Applicable Reductions for eligibilities 2.a.iii. and 2.a.iv.:*
      i. For members hired prior to September 1, 2009, none.
      ii. For members hired on or after September 1, 2009, but prior to September 1, 2013, reduced five percent for each year the member retires prior to age 60, with a maximum possible reduction of 25 percent.
      iii. For members hired on or after September 1, 2013, reduced five percent for each year the member retires prior to age 62, with no maximum possible reduction.
   d. *Applicable Reductions for eligibility 2.a.v.:*
      i. For members hired prior to September 1, 2009, retiring after attaining age 50 or after attaining Rule of 80, there is no reduction. Otherwise, the member receives the percentage of the benefit stated in the following table:

Attained Age at Retirement	Reduction Percentage	Attained Age at Retirement	Reduction Percentage
36	31.2%	43	55.3%
37	33.9%	44	60.1%
38	36.7%	45	65.3%
39	39.8%	46	71.1%
40	43.2%	47	77.3%
41	46.9%	48	84.2%
42	50.9%	49	91.7%

      ii. For members hired after on or after September 1, 2009, but prior to September 1, 2013, reduced five percent for each year the member retires prior to age 55, with a maximum possible reduction of 25 percent.
      iii. For members hired on or after September 1, 2013, reduced five percent for each year the member retires prior to age 57, with no maximum possible reduction.

3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Standard Non-Occupational Disability Annuity

1. Elected Class:
   a. *Eligibility*:
      i. 8 years of elected class service; or
      ii. 6 years of elected class service plus 2 years of pre-1978 military service; and
      iii. Not eligible for a Standard Service Retirement Annuity.
   b. *Benefits:* 2.3% of AMC times years of Creditable Service, adjusted automatically based on the State salary of a district judge.
2. Employee Class:
   a. *Eligibility*:
      i. 10 years of employee class service; and
      ii. Not eligible for a Standard Service Retirement Annuity on the basis of Rule of 80 or age 55 and 10 years of CPO/CO Service.
   b. *Benefits:* 2.3% of AMC times years of Creditable Service
   c. *Applicable Reductions:* Actuarially reduced from the age that the member would have been eligible for Standard Service Retirement Annuity
3. Normal Form of Payment: Annuity payable for life or until member is no longer incapacitated for the performance of duty. Any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Standard Occupational Disability Annuity*:*

1. Elected Class:
   a. *Eligibility*: Disability as a direct result of some risk or hazard inherent to employment
   b. *Benefits:* 2.3% of AMC times years of Creditable Service, but not less than 18.4% of AMC, adjusted automatically based on the State salary of a district judge
2. Employee Class (Regular Class Service):
   a. *Eligibility*: Disability as a direct result of some risk or hazard inherent to employment
   b. *Benefits:* 2.3% of AMC times years of Creditable Service, but not less than 35% of AMC

3. Employee Class (CPO/CO Members):
    a. *Eligibility*: Disability as a direct result of some risk or hazard inherent to law enforcement or custodial duties
        i. Total: Incapable of substantial gainful activity and eligible for Social Security disability benefits
        ii. Non-total: Does not satisfy definition of Total Disability
    b. *Benefits:*
        i. Non-total with less than 20 years of CPO/CO Service: 2.3% of AMC times years of Creditable Service, but not less than 50% of AMC. 15% of AMC payable from LECOSRF and the remaining 35% of AMC is payable from the ERS trust
        ii. Non-total with 20 years of CPO/CO Service: 2.3% of AMC times years of Creditable Service
        iii. Total: 2.3% of AMC times years of Creditable Service, but not less than 35% of AMC
4. Normal Form of Payment: Annuity payable for life or until member is no longer incapacitated for the performance of duty. Any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Occupational Disability Lump-Sum Death Benefit

If a member receiving an occupational disability retirement annuity dies and it is determined that the death was an occupational death, a lump-sum death benefit is payable in an amount equal to one year's salary, computed on the basis of the retiree's rate of compensation at the time of disability retirement, and payable to a surviving spouse or dependent minor child.

Death Benefit Plan (DBP) Annuity

1. Eligibility:
    a. 10 years of employee class service; or
    b. Eligible for Standard Service Retirement Annuity at time of death.
2. Benefits: Benefits are calculated as if the member had elected an optional form of payment, received a standard service retirement annuity, and died immediately thereafter. If the member dies before becoming eligible for the Standard Service Retirement Annuity, the benefit is reduced for early retirement as follows:
    a. With 12 years of elected class service, the benefit is actuarially reduced from the member's age 50,
    b. With 10 years of CPO/CO service, the benefit is actuarially reduced from the member's age 55,
    c. With five years of employee class service for members hired before September 1, 2009 or eight years of elected class service, the benefit is actuarially reduced from the member's age 60, and
    d. With 10 years of employee class service for members hired on or after September 1, 2009, the benefit is actuarially reduced from the member's age 65.

Pre-Retirement Death Refund Alternative

A refund of accumulated contributions is payable in cases of pre-retirement death where the member did not meet the eligibility requirements for a Death Benefit Plan Annuity, or the eligible beneficiary choses to receive a refund of the member account balance in lieu of an annuity. This amount is increased by 5% of the member's account balance at death, times full years of service credit at death, to a maximum of 100%.

Occupational Death Lump-Sum Benefit

If an active member dies and it is determined that the death was an occupational death, a lump-sum death benefit is payable in an amount equal to one year's salary, computed on the basis of the member's rate of compensation at the time of death and payable to a surviving spouse or dependent minor child in addition to any other death benefits.

Post-Retirement Death General Lump-Sum Benefit

$5,000 upon the death of a retired member. This amount is funded separately by the State and not reflected in this valuation.

Deferred Service Retirement Annuity

1. Elected Class:
    a. *Eligibility*: Eight years of elected class service
    b. *Benefits:* Standard Service Retirement Annuity payable at age 60 (or 50 with 12 years of elected class service)
2. Employee Class:
    a. *Eligibility*:
        i. Members hired prior to September 1, 2009: Five years of employee class service
        ii. Members hired on or after September 1, 2009: 10 years of employee class service
    b. *Benefits:*
        i. For members hired prior to September 1, 2009: Standard Service Retirement Annuity payable at age 60
        ii. For members hired on or after September 1, 2009: Standard Service Retirement Annuity payable at age 65
        iii. For members with 10 years of CPO/CO service: Standard Service Retirement Annuity payable at age 55
3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Refund of Accumulated Contributions

A refund of accumulated contributions is payable in cases where a terminated member did not meet the eligibility requirements for an annuity, or a terminated member chooses to receive a refund of his or her account balance in lieu of an annuity.

Maximum Benefits

Annuity benefits are limited to 100% of Average Monthly Compensation. For members with CPO/CO service, this benefit limitation includes benefits from all sources (ERS and the Law Enforcement and Custodial Officer Supplemental Retirement Fund).

Limit on Plan Modifications

According to Section 811.006 of the Texas Government Code – a rate of member or State contributions to or a rate of interest required for the establishment of credit in the retirement system may not be reduced or eliminated, a type of service may not be made creditable in the retirement system, a limit on the maximum permissible amount of a type of creditable service may not be removed or raised, a new monetary benefit payable by the retirement system may not be established, and the determination of the amount of a monetary benefit from the system may not be increased, if, as a result of the particular action, the time, as determined by an actuarial valuation, required to amortize the UAAL of the retirement system would be increased to a period that exceeds 30 years by one or more years.

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation that covered the five-year period from September 1, 2006 through August 31, 2011.

I. Valuation Date

The valuation date is August 31 of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation is used to determine the adequacy of the State contribution rate (established by Legislative appropriation) and employer contribution rate (established by statute) and to describe the current financial condition of ERS.

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the first step is to determine the contribution rate (level as a percentage of pay) required to provide the benefits to each member, or the normal cost rate. The normal cost rate consists of two pieces: (i) the member's contribution rate, and (ii) the remaining portion of the normal cost rate which is the employer's normal cost rate. The total normal cost rate is based on the benefits payable to a new member and the entry age characteristics of the current active membership.

The Unfunded Actuarial Accrued Liability (UAAL) is the liability for future benefits which is in excess of (i) the actuarial value of assets, and (ii) the present value of future normal costs. The employer contribution provided in excess of the employer normal cost is applied to amortize the UAAL.

The funding period is calculated as the number of years required to fully amortize the UAAL, assuming that: (a) future market earnings, net of investment-related expenses, will equal 8.00% per year, (b) there will be no liability gains/losses or changes in assumptions, (c) the number of active members will remain unchanged, (d) active members who leave employment will be replaced by new entrants each year, and (e) State and employer contributions will remain the same percentage of payroll as described in Appendix I.

The Entry Age actuarial cost method is an "immediate gain" method (i.e., experience gains and losses are separately identified as part of the UAAL). However, they are amortized over the same period applied to all other components of the UAAL.

III. *Actuarial Value of Assets*

The actuarial value of assets is determined as the expected value of plan assets as of the valuation date plus 20% of the difference between the market-related value and the expected value. The expected value equals the actuarial value of plan assets as of the prior valuation date, plus contributions, less benefit payments and administrative expenses, all accumulated at the assumed rate of interest to the current valuation date.

IV. *Actuarial Assumptions*

Investment Return: 8.00% per year, net of investment-related expenses (composed of an assumed 3.50% inflation rate and a 4.50% real rate of return)

Administrative Expenses: 0.25% of valuation payroll per year

Salary Increases: Increases are assumed to occur at the beginning of the valuation year and vary by employee group. The components of the annual increases are:

Employee Group	Inflation ***	Real Wage Growth	Merit, Promotion and Longevity
Legislators	0%	0%	0%
Elected Class other than Legislators	3.5%	0%	0%
Employee Class	3.5%	0%	See sample rates
State Salary of a District Judge*	3.5%	0%	0%
Inactive members who transfer to TRS**	3.5%	0%	1.5%

* The State salary of a district judge is the compensation used to determine benefit amounts for Legislators. It is also used for benefits for other Elected Class members if it provides a more valuable benefit amount than actual average compensation.

** Assumed in estimating benefits of former members who transfer to the Teacher Retirement System of Texas (TRS).

*** Total liabilities for this valuation reflect the most significant across-the-board pay increases appropriated by the State legislature for the current biennium.

Sample Rates:

Annual Salary Increases for Merit, Promotion and Longevity Male and Female Regular Employee Class Members							
	Years of ERS Decrement Service						
Age	0	1	2 - 4	5 - 9	10 - 14	15 - 19	20+
20	6.80 %	5.25 %	4.75 %	4.30 %			
25	6.40	5.25	4.75	3.50	2.50 %		
30	5.90	5.25	4.75	3.00	2.50	2.00 %	
35	5.40	4.75	4.00	3.00	2.50	2.00	1.90 %
40	4.90	4.75	4.00	3.00	2.50	1.90	1.80
45	4.40	4.25	3.75	3.00	2.40	1.90	1.70
50	3.90	3.70	3.20	2.70	2.20	1.70	1.60
55	3.40	3.20	2.80	2.40	1.90	1.60	1.50
60+	2.90	2.70	2.30	2.00	1.60	1.40	1.30

Annual Salary Increases for Merit, Promotion and Longevity Male and Female CPO/CO Employee Class Members							
	Years of ERS Decrement Service						
Age	0	1	2	3	4	5 - 9	10+
All	8.00 %	5.00 %	4.50 %	4.00 %	3.50 %	2.00 %	1.50 %

Payroll Growth: 3.50% per year, compounded annually (for projecting valuation payroll).

Post-Retirement Increases for Elected Class Members: If benefits are based on the State salary of a district judge, the benefits are assumed to increase 3.50% per year during retirement (each September 1), compounded annually, consistent with the assumed Salary Increase for a district judge. Increases are assumed to also occur during deferral periods (if any). Otherwise, no increases are assumed.

Age and Service Assumptions and Methods:

Rounding of ages:

Current and projected ages rounded to the nearest year are used for all purposes – determining eligibility for benefits, present value factors, early retirement reductions, option factors, salary increase rates, and decrements.

Benefit Service:

Current Benefit Service in years and months as of the valuation date was provided by ERS. This service plus Future Earned Service, Service Credit at Retirement, and Eligibility Service at Retirement were used to project benefit amounts.

Future Earned Service:

Active members were assumed to earn one additional year of service credit in each future year employed based on their current class of membership (but not beyond the

amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

Service Credit at Retirement:

For members hired before September 1, 2009, service credit when eligible for service retirement is assumed to be increased by:

- 0 years for members retiring from the Elected Class;
- 1.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is greater than or equal to 78;
- 0.5 years for members retiring from regular employee class service if age plus service, prior to adjustment, is less than 78;
- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 18 years; and
- 0.5 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 18 years.

(but not beyond the amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

For members hired on or after September 1, 2009, service credit when eligible for service retirement is assumed to be increased by:

- 0 years for members retiring from the Elected Class;
- 1.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is greater than or equal to 79;
- 0.5 years for members retiring from regular employee class service if age plus service, prior to adjustment, is less than 79;
- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 19 years; and
- 0.5 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 19 years.

(but not beyond the amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

Service for Decrements:

The method of calculating ERS Decrement Service and CPO/CO Decrement Service on the valuation date is shown below. Decrement service is assumed to increase by one year for each future year employed based on their current class of membership.

- Valuation Age: Age rounded to the nearest year on valuation date
- ERS Benefit Service: Years and months of all creditable ERS service on the valuation date
- CPO/CO Benefit Service: Years and months of creditable CPO/CO service on the valuation date
- Date 1: (Valuation Date) minus (ERS Benefit Service)
- ERS Decrement Service: (Valuation Age) minus (age rounded to nearest year on Date 1)
- ERS Funding Entry Age (age at hire for the entry age normal cost method): (Valuation Age) minus (ERS Decrement Service)
- Date 2: (Valuation date) minus (CPO/CO Benefit Service)

- CPO/CO Decrement Service: (Valuation Age) minus (age rounded to nearest year on Date 2)

Eligibility Service at Retirement:

For members hired before September 1, 2009, eligibility service is assumed to be increased by the following to reach eligibility for service retirement:

- 0 years for members retiring from the Elected Class;
- 2.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is greater than or equal to 78;
- 1.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is less than 78;
- 2.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 18 years; and
- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 18 years.

For members hired on or after September 1, 2009, eligibility service is assumed to be increased by the following to reach eligibility for service retirement:

- 0 years for members retiring from the Elected Class;
- 1.0 years for members retiring from regular employee class service ; and
- 1.0 years for members retiring from CPO/CO class service.

Decrement Timing: All decrements – mortality, service retirement, disability retirement, and termination of employment for reasons other than death or retirement – are assumed to occur at the beginning of the valuation year.

Mortality Decrements:

Active Members, Service Retirees, Beneficiaries, and Inactive Members

1994 Group Annuity Mortality with no setback for males and set forward two years for females. Generational mortality improvements in accordance with Scale AA are projected from the year 2000.

Disability Retirees

RP-2000 Disabled Retiree Mortality set forward six years for males and setback one year for females.

Occupational Death

2.0% of male and 0.3% of female active member deaths are assumed to be occupational.

Service Retirement Decrements: Graded tables based on ERS experience.

Active Regular Employee Class Members – hired before September 1, 2009

ERS Decrement Service is used to determine when the rates apply:

- Age 60 with four years of service
- 78 points with five years of service

Sample rates for eligible members:

Annual Service Retirement Rates per 100 Participants Regular Employee Class Members												
	Males - Years of ERS Decrement Service						Females - Years of ERS Decrement Service					
Age	5	10	15	20	25	30	5	10	15	20	25	30
50						35						45
51						25						40
52						25						25
53					35	25					40	25
54					60	25					60	25
55					22.5	25					40	25
56					20	25					25	25
57					20	25					25	25
58				35	20	25				40	25	25
59				60	20	25				60	25	25
60	10	15	17.5	37.5	20	27.5	10	15	15	35	20	20
65	20	45	45	35	35	35	20	45	45	32.5	32.5	32.5
70	20	37.5	27.5	32.5	32.5	32.5	20	37.5	27.5	32.5	32.5	32.5
75	100	100	100	100	100	100	100	100	100	100	100	100

Active Regular Employee Class Members – hired on or after September 1, 2009

ERS Decrement Service is used to determine when the rates apply:

- Age 65 with nine years of service
- 79 points with five years of service

Sample rates for eligible members:

Annual Service Retirement Rates per 100 Participants Regular Employee Class Members												
	Males - Years of ERS Decrement Service						Females - Years of ERS Decrement Service					
Age	5	10	15	20	25	30	5	10	15	20	25	30
50						15						20
51						15						25
52						7.5						10
53						7.5						10
54					5	7.5					12.5	10
55					25	7.5					30	10
56					12.5	7.5					15	10
57					7.5	7.5					10	10
58					7.5	7.5					10	10
59				5	7.5	7.5				12.5	10	10
60				25	57.5	67.5				25	45	45
65		85	37.5	30	45	40		85	37.5	17.5	35	30
70		80	60	90	35	35		80	60	90	32.5	32.5
75	100	100	100	100	100	100	100	100	100	100	100	100

Active Elected Class Members

ERS Decrement Service is used to determine when the rates apply:

- Age 60 with eight years of service
- Age 50 with 12 years of service

Annual Service Retirement Rates per 100 Participants Elected Class Members	
Age	Male and Female
50 - 64	10
65 - 74	20
75+	100

Active CPO/CO Employee Class Members – hired before September 1, 2009

CPO/CO Decrement Service is used to determine when the rates apply:

- Any age with 18 years of CPO/CO service
- Age 55 with nine years of CPO/CO service

Sample rates for eligible members:

Annual Service Retirement Rates per 100 Participants CPO/CO Employee Class Members - Male and Female						
	Years of CPO/CO Decrement Service					
Age	5	10	15	20	25	30
50				45	55	55
51				30	30	30
52				30	30	30
53				30	30	30
54				30	30	30
55		12	12	45	35	35
56		10	10	45	35	35
57		10	10	45	45	45
58		10	10	45	35	35
59		13	13	45	35	35
60	6	16	16	55	35	35
65	15	35	35	50	60	60
70	50	50	50	50	50	50
75	100	100	100	100	100	100

Active CPO/CO Employee Class Members – hired on or after September 1, 2009

CPO/CO Decrement Service is used to determine when the rates apply:

- Any age with 19 years of CPO/CO service
- Age 55 with nine years of CPO/CO service

Sample rates for eligible members:

Annual Service Retirement Rates per 100 Participants CPO/CO Employee Class Members - Male and Female						
	Years of CPO/CO Decrement Service					
Age	5	10	15	20	25	30
50				5	5	5
51				5	5	5
52				5	5	5
53				5	5	5
54				5	5	5
55		12	12	82.5	65	65
56		10	10	37.5	30	30
57		10	10	37.5	37.5	37.5
58		10	10	37.5	30	30
59		13	13	37.5	30	30
60		16	16	55	35	35
65		35	35	50	60	60
70		50	50	50	50	50
75	100	100	100	100	100	100

Disability Retirement Decrements: Graded Tables Based on ERS Experience

Active Regular Employee Class Members

ERS Decrement Service is used to determine when the rates apply:

- The rates do not apply before someone is eligible for the benefit.
- Service greater than zero is required for occupational disability retirement.
- 10 years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60, if hired before September 1, 2009, or age 65, if hired on or after September 1, 2009.

Active Elected Class Members

ERS Decrement Service is used to determine when the rates apply:

- The rates do not apply before someone is eligible for the benefit.
- No occupational disabilities are assumed for the elected class.
- Eight years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60, if hired before September 1, 2009, or age 65, if hired on or after September 1, 2009.

Sample rates for eligible regular employee class and elected class members:

Annual Disability Rates per 100 Participants		
	Regular Employee Class and Elected Class	
Age	Males	Females
30	0.0366	0.0180
35	0.0867	0.0589
40	0.0999	0.1195
45	0.1369	0.1940
50	0.1979	0.2762
55	0.3302	0.4651
60	0.4986	0.7444

99% of the disability rates stated above are assumed to be attributable to non-occupational disabilities and 1% are assumed to be attributable to occupational disabilities. No occupational disabilities are assumed for the elected class.

Active CPO/CO Employee Class Members

ERS Decrement Service and CPO/CO Decrement Service are used to determine when the rates apply:

- The rates do not apply before a member is eligible for the benefit.
- Service greater than zero is required for occupational disability retirement.
- 10 years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60, if hired before September 1, 2009, or age 65, if hired on or after September 1, 2009.

Sample rates for members:

Annual Disability Rates per 100 Participants CPO/CO Employee Class Members	
Age	Males and Females
30	0.0123
35	0.0418
40	0.0781
45	0.1307
50	0.2365
55	0.3280
60	0.4200

95% of the disability rates stated above are assumed to be attributable to non-occupational disabilities, 4% are assumed to be attributable to non-total occupational disabilities, and 1% are assumed to be attributable to total occupational disabilities.

Termination Decrements for Reasons Other Than Death or Retirement: Graded Tables Based on ERS Experience.

Rates of termination are zero for members eligible for service retirement.

Sample rates for members not eligible for service retirement:

Active Regular Employee Class Members – hired before September 1, 2009

Annual Rates of Termination per 100 Participants Regular Employee Class Members									
	Male and Female - Years of ERS Decrement Service								
Age	0	1	2	3	4	5	10	15	20
20	50	40	30	30					
25	35	30	26	22	20	15			
30	28	23	19	15	14	12	6		
35	27	21	16	14	11	10	6	3	
40	25	18	13	11	10	9	6	3	3
45	25	18	13	11	9	8	4	3	1
50	22	17	13	10	9	7	4	2	1
55	21	15	11	9	7	7	4	2	1
60	20	15	10	8					

Active CPO/CO Employee Class Members – hired before September 1, 2009

Annual Rates of Termination per 100 Participants CPO/CO Employee Class Members								
	Male and Female - Years of ERS Decrement Service							
Age	0	1	2	3	4	5	10	15
20	23	19	17	17				
25	20	17	14	14	14	13		
30	16	13	12	11	10	10	8	
35	16	11	9	9	8	7	6	4
40	14	10	8	7	7	7	5	2
45	13	10	7	6	6	6	3	2
50	12	9	7	6	6	6	3	2
55	12	7	5	5	4	4		
60	13	7	5	5				

Active Regular Employee Class Members – hired on or after September 1, 2009

Annual Rates of Termination per 100 Participants Regular Employee Class Members									
	Male and Female - Years of ERS Decrement Service								
Age	0	1	2	3	4	5	10	15	20
20	52	42	32	27					
25	42	32	29	25	22	18			
30	32	27	21	18	15	14	6		
35	31	25	19	16	12	11	6	4	
40	30	21	15	13	11	9	6	2	2
45	27	21	13	12	10	8	4	2	1
50	26	19	13	11	10	7	4	2	1
55	25	17	12	10	7	7	4	2	1
60	24	17	11	9	6	6	4	1	
65	22	16	10	6					

Active CPO/CO Employee Class Members – hired on or after September 1, 2009

Annual Rates of Termination per 100 Participants CPO/CO Employee Class Members								
	Male and Female - Years of ERS Decrement Service							
Age	0	1	2	3	4	5	10	15
20	24	20	17	17				
25	22	19	16	16	16	15		
30	17	15	14	12	12	12	8	
35	18	12	11	11	10	8	6	4
40	15	11	9	8	8	8	5	2
45	14	11	8	7	7	7	3	2
50	13	11	8	7	7	6	3	2
55	13	8	5	5	4	4		
60	15	8	5	5				

Elected Class Members: 4 per 100 participants for members not eligible for service retirement

Withdrawal of Employee Contributions: Members that terminate with a vested benefit are assumed to choose the most valuable option available to them at the time of termination: withdrawal of contributions or deferred annuity.

Percentage of Members Electing Various Benefit Options:

Sex/ Benefit	Standard Life Annuity	Option 1	Option 4
Male Member			
Disability	50%	40%	10%
Service Retirement	100%	0%	0%
Death Benefit Plan	0%	75%	25%
Female Member			
Disability	75%	20%	5%
Service Retirement	100%	0%	0%
Death Benefit Plan	0%	50%	50%

The value of the Standard Service Retirement Life Annuity reflects the return of excess contributions payable as a lump sum death benefit in cases the annuity benefits paid are less than the member account balance at the time of retirement.

Beneficiary Characteristics: Male member is assumed to be three years older than female beneficiary; and female member is assumed to be the same age as male beneficiary.

Transfers from ERS to TRS:

Contributing ERS members:

It is assumed that 10% of regular and CPO/CO employee class members who cease contributing to ERS and do not withdraw employee contributions will transfer ERS service credit to TRS at retirement.

Noncontributing ERS Members:

Records of ERS and TRS are matched by ERS staff to determine former ERS members who are currently contributing under TRS.

TRS Retirement Age:

Former ERS members who are, or are assumed to become, contributing TRS members are assumed to continue to earn service credit under TRS until first eligible for unreduced service retirement benefits, retire at that time, and transfer ERS service credit to TRS.

Census Data and Assets

- The valuation was based on members of ERS as of August 31, 2016 and does not take into account future members.
- All census data was supplied by ERS and was subject to reasonable consistency checks.
- There were data elements that were modified for some members as part of the valuation in order to make the data complete. However, the number of missing data items was immaterial.
- Asset data was supplied by ERS.

Other Actuarial Valuation Procedures

- No provision was made in this actuarial valuation for the limitations of Internal Revenue Code Sections 415 or 401(a)17.
- Valuation payroll (earnings applied to the current valuation year) is the expected payroll for the fiscal year following the valuation date. It is based on reported payroll determined from August member contributions increased to reflect the across-the-board salary increases appropriated by the State legislature, effective on or after September 1, and projected according to the actuarial assumptions for the upcoming fiscal year.
- No liability was included for benefits which are funded by special State appropriations.
- State appropriations for membership fees have been ignored.

DETAILED SUMMARIES OF MEMBERSHIP DATA

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H	53	RETIRED AND BENEFICIARY MEMBERS: DISTRIBUTION BY AGE AND CATEGORY (ANNUITANTS WHERE ERS IS REIMBURSING TRS)

TABLE A

SUMMARY OF MEMBERSHIP DATA

Active Members

Item	Male	Female	Regular Members	Elected Class	LECOS Members	Total
Number of Members	63,562	82,828	107,002	322	39,066	146,390
Average Annual Salaries	$ 49,928	$ 43,861	$ 47,106	$ 69,361	$ 44,634	$ 46,495
Average Age	43.3	43.4	44.2	52.6	41.0	43.3
Average Service	8.7	8.4	8.8	9.1	8.0	8.5

Annuitants

Item	Number	Annual Annuities	Average Annuities	Average Age
Service Retirees and Beneficiaries	101,362	$ 2,018,378,484	19,913	68.9
Disability Retirees	2,396	$ 22,309,296	9,311	66.0
Total	103,758	$ 2,040,687,780	$ 19,668	68.8

Inactive Members Assumed Eligible for Deferred Annuities

Item	Number	Annual Annuities	Average Annuities	Average Age
Vested Members who are not Active at TRS	14,252	$ 149,186,172	$ 10,468	49.2
Vested Members who are Active at TRS	2,345	$ 43,968,204	$ 18,750	51.8
Total	16,597	$ 193,154,376	$ 11,638	49.6
Non-vested Members who are Active at TRS	7,197	$ 23,443,632	$ 3,257	46.5

Non-vested Inactive Members

Item	Number	Account Balances	Average Account Balance	Average Age
Non-vested Members who are not Active at TRS	85,079	$ 216,884,282	$ 2,549	40.5
Non-vested Members who are Active at TRS (this group assumed eligible for deferred annuities)	7,197	$ 27,909,516	$ 3,878	46.5
Total	92,276	$ 244,793,798	$ 2,653	41.0

TABLE B

ACTIVE MEMBERS – ALL MEMBERS
DISTRIBUTION BY AGE AND SERVICE

	Years of Service									
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40+**	**Total**
Under 25	9,685	53								9,738
	$ 29,664	$ 34,883								$ 29,693
25 - 29	13,547	1,745	41							15,333
	$ 36,785	$ 41,223	$ 39,756							$ 37,298
30 - 34	10,971	5,149	1,255	85						17,460
	$ 39,412	$ 48,461	$ 49,944	$ 49,411						$ 42,886
35 - 39	8,322	4,506	2,790	1,390	52					17,060
	$ 40,347	$ 49,491	$ 57,359	$ 55,437	$ 55,278					$ 46,819
40 - 44	7,030	3,887	2,638	3,159	1,383	59				18,156
	$ 40,783	$ 47,929	$ 55,337	$ 59,018	$ 58,563	$ 60,126				$ 49,017
45 - 49	6,203	3,845	2,609	3,313	3,417	1,471	78			20,936
	$ 40,826	$ 47,372	$ 53,138	$ 56,261	$ 62,006	$ 64,063	$ 67,553			$ 51,194
50 - 54	5,187	3,468	2,389	2,862	2,637	1,994	494	32		19,063
	$ 40,444	$ 45,859	$ 51,338	$ 53,978	$ 59,414	$ 67,387	$ 75,818	$ 68,811		$ 51,233
55 - 59	3,996	3,187	2,238	2,478	1,880	1,095	544	168	2	15,588
	$ 41,791	$ 46,125	$ 50,723	$ 52,825	$ 58,426	$ 67,173	$ 76,927	$ 71,106	$116,504	$ 51,055
60 - 64	2,107	2,340	1,484	1,641	894	531	270	126	23	9,416
	$ 42,225	$ 47,230	$ 49,576	$ 52,017	$ 61,140	$ 66,161	$ 68,342	$ 75,138	$ 61,502	$ 50,716
Over 64	776	1,051	598	504	357	196	86	36	36	3,640
	$ 43,299	$ 47,813	$ 49,757	$ 54,780	$ 58,100	$ 64,414	$ 73,153	$ 69,163	$ 75,640	$ 51,123
Total	67,824	29,231	16,042	15,432	10,620	5,346	1,472	362	61	146,390
	$ 38,232	$ 47,264	$ 52,889	$ 55,239	$ 60,043	$ 66,117	$ 74,263	$ 72,113	$ 71,649	$ 46,495

TABLE C

ACTIVE MEMBERS – REGULAR CLASS MEMBERS
DISTRIBUTION BY AGE AND SERVICE

	Years of Service									
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40+**	**Total**
Under 25	5,546	30								5,576
	$ 26,432	$ 30,087								$ 26,452
25 - 29	9,540	962	27							10,529
	$ 36,156	$ 38,473	$ 38,245							$ 36,373
30 - 34	8,220	3,693	738	54						12,705
	$ 39,664	$ 47,433	$ 50,502	$ 47,268						$ 42,584
35 - 39	6,235	3,401	1,875	878	33					12,422
	$ 41,119	$ 49,624	$ 57,032	$ 55,885	$ 54,070					$ 46,928
40 - 44	5,276	2,931	1,783	2,196	719	39				12,944
	$ 41,540	$ 48,232	$ 55,934	$ 59,203	$ 58,707	$ 57,037				$ 49,035
45 - 49	4,744	2,891	1,838	2,375	2,184	1,002	65			15,099
	$ 41,486	$ 47,823	$ 54,100	$ 57,177	$ 63,818	$ 63,561	$ 65,324			$ 51,501
50 - 54	3,960	2,552	1,726	2,129	2,183	1,713	398	30		14,691
	$ 41,180	$ 46,249	$ 52,880	$ 55,548	$ 59,871	$ 66,379	$ 72,041	$ 66,802		$ 52,121
55 - 59	3,128	2,426	1,700	1,977	1,586	1,010	486	161	2	12,476
	$ 42,853	$ 46,894	$ 52,109	$ 54,244	$ 59,428	$ 66,712	$ 74,816	$ 70,085	$ 116,504	$ 52,352
60 - 64	1,658	1,807	1,216	1,331	755	503	255	124	23	7,672
	$ 43,293	$ 48,312	$ 50,593	$ 53,190	$ 63,042	$ 66,650	$ 68,162	$ 74,794	$ 61,502	$ 52,214
Over 64	584	763	481	413	317	178	83	34	35	2,888
	$ 44,539	$ 49,865	$ 51,361	$ 57,509	$ 59,120	$ 65,562	$ 74,344	$ 71,501	$ 77,596	$ 53,408
Total	48,891	21,456	11,384	11,353	7,777	4,445	1,287	349	60	107,002
	$ 38,552	$ 47,475	$ 53,627	$ 56,150	$ 61,034	$ 65,735	$ 72,130	$ 71,614	$ 72,723	$ 47,106

TABLE D

ACTIVE MEMBERS – CPO/CO MEMBERS
DISTRIBUTION BY AGE AND SERVICE

	Years of Service									
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40+**	**Total**
Under 25	4,139	23								4,162
	$ 33,995	$ 41,139								$ 34,035
25 - 29	4,007	783	14							4,804
	$ 38,283	$ 44,602	$ 42,672							$ 39,325
30 - 34	2,741	1,455	517	31						4,744
	$ 38,577	$ 51,101	$ 49,149	$ 53,146						$ 43,666
35 - 39	2,075	1,097	913	512	19					4,616
	$ 37,964	$ 49,025	$ 58,140	$ 54,668	$ 57,377					$ 46,516
40 - 44	1,723	942	852	961	664	20				5,162
	$ 37,911	$ 46,463	$ 53,944	$ 58,702	$ 58,407	$ 66,150				$ 48,734
45 - 49	1,435	934	760	933	1,232	469	13			5,776
	$ 38,094	$ 44,986	$ 50,410	$ 54,049	$ 58,840	$ 65,136	$ 78,696			$ 50,118
50 - 54	1,215	894	654	727	452	280	96	2		4,320
	$ 37,829	$ 43,618	$ 46,273	$ 48,855	$ 57,440	$ 73,769	$ 91,478	$ 98,944		$ 47,763
55 - 59	857	754	527	497	290	84	58	7		3,074
	$ 37,586	$ 43,484	$ 45,427	$ 46,804	$ 52,738	$ 71,846	$ 94,612	$ 94,580		$ 45,439
60 - 64	440	520	262	302	133	28	12	2		1,699
	$ 37,711	$ 42,937	$ 44,808	$ 46,716	$ 50,776	$ 57,369	$ 87,454	$ 96,483		$ 43,773
Over 64	179	280	110	85	38	14	2	1		709
	$ 37,422	$ 41,485	$ 43,036	$ 44,880	$ 48,781	$ 66,170	$ 56,699	$ 51,642		$ 42,043
Total	18,811	7,682	4,609	4,048	2,828	895	181	12		39,066
	$ 37,216	$ 46,279	$ 50,778	$ 52,663	$ 57,364	$ 68,262	$ 90,913	$ 92,047		$ 44,634

TABLE E

ACTIVE MEMBERS – ELECTED CLASS MEMBERS
DISTRIBUTION BY AGE AND SERVICE

	Years of Service									
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40+**	**Total**
Under 25										
25 - 29										
30 - 34	10	1								11
	$ 60,320	$ 7,200								$ 55,491
35 - 39	12	8	2							22
	$ 51,467	$ 57,000	$ 7,200							$ 49,455
40 - 44	31	14	3	2						50
	$ 71,568	$ 83,086	$ 95,733	$ 7,200						$ 73,668
45 - 49	24	20	11	5	1					61
	$ 73,639	$ 93,520	$ 80,886	$ 33,760	$ 7,200					$ 77,106
50 - 54	12	22	9	6	2	1				52
	$ 62,533	$ 91,709	$123,661	$ 117,867	$ 7,200	$ 7,200				$ 88,649
55 - 59	11	7	11	4	4	1				38
	$ 67,564	$ 64,114	$ 90,368	$ 99,800	$ 73,600	$ 140,000				$ 79,464
60 - 64	9	13	6	8	6		3			45
	$ 66,222	$ 68,564	$ 51,623	$ 57,000	$ 51,467		$ 7,200			$ 57,411
Over 64	13	8	7	6	2	4	1	1	1	43
	$ 68,492	$ 73,600	$ 45,143	$ 7,200	$ 73,600	$ 7,200	$ 7,200	$ 7,200	$ 7,200	$ 47,349
Total	122	93	49	31	15	6	4	1	1	322
	$ 67,105	$ 80,036	$ 80,083	$ 57,703	$ 51,467	$ 29,333	$ 7,200	$ 7,200	$ 7,200	$ 69,361

TABLE F

RETIRED AND BENEFICIARY MEMBERS – EXCLUDING DEFERRED LECOSRF AND ERS REIMBURSING TRS ANNUITANTS

DISTRIBUTION BY AGE AND CATEGORY

Age Last Birthday	Number	Annual Benefit	Average Annual Benefit
Service Retirees			
Under 60	14,929	442,538,580	29,643
60 - 64	17,411	399,005,412	22,917
65 - 69	21,754	431,591,796	19,840
70 - 74	14,926	264,946,260	17,751
75 - 79	9,322	154,198,128	16,541
Over 79	10,123	181,124,064	17,892
Total	88,465	1,873,404,240	21,177
Beneficiaries			
Under 60	1,115	13,464,468	12,076
60 - 64	684	10,133,532	14,815
65 - 69	1,044	14,933,568	14,304
70 - 74	1,161	16,654,092	14,345
75 - 79	1,251	19,553,688	15,630
Over 79	2,866	49,646,400	17,323
Total	8,121	124,385,748	15,317
Disabled Retirees			
Under 60	586	4,776,696	8,151
60 - 64	406	4,277,724	10,536
65 - 69	543	5,634,552	10,377
70 - 74	325	3,294,372	10,137
75 - 79	189	1,815,396	9,605
Over 79	196	2,036,376	10,390
Total	2,245	21,835,116	9,726
Grand Total	98,831	2,019,625,104	20,435

TABLE G

RETIRED AND BENEFICIARY MEMBERS – LECOSRF ANNUITANTS DEFERRED IN ERS DISTRIBUTION BY AGE AND CATEGORY

Age Last Birthday	Number	Annual Benefit	Average Annual Benefit
All Participants			
Under 45	0	0	0
45 - 49	34	634,956	18,675
Total	34	634,956	18,675
Grand Total	34	634,956	18,675

TABLE H

RETIRED AND BENEFICIARY MEMBERS – ANNUITANTS WHERE ERS IS REIMBURSING TRS DISTRIBUTION BY AGE AND CATEGORY

Age Last Birthday	Number	Annual Benefit	Average Annual Benefit
Service Retirees and Beneficiaries			
Under 60	455	2,535,420	5,572
60 - 64	1,052	5,380,548	5,115
65 - 69	1,497	6,218,004	4,154
70 - 74	976	3,653,760	3,744
75 - 79	523	1,558,452	2,980
Over 79	239	607,356	2,541
Total	4,742	19,953,540	4,208
Disabled Retirees			
Under 60	57	219,888	3,858
60 - 64	37	117,780	3,183
65 - 69	34	98,568	2,899
70 - 74	20	33,924	1,696
75 - 79	3	4,020	1,340
Over 79	0	0	0
Total	151	474,180	3,140
Grand Total	4,893	20,427,720	4,175

GLOSSARY

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ARC.

Actuarial Gain or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.),
b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB.

Actuarial Value of Assets or ***Valuation Assets:*** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ARC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: That portion of the pension plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Actuarially Determined Contribution (ADC) or ***Annual Required Contribution (ARC):*** A calculated contribution for a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the calculated contribution has a normal cost payment and an amortization payment.

Closed Amortization Period: A specific number of years that is counted down by one each year and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: An employer-sponsored retirement benefit that provides workers, upon attainment of designated age and service thresholds, with a monthly benefit based on the employee's salary and length of service. The value of a benefit from a defined benefit plan is generally not affected by the return on the assets that are invested to fund the benefit.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Funding Period or ***Amortization Period:*** The term "Funding Period" is used it two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ARC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

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

LAW ENFORCEMENT AND CUSTODIAL OFFICER (LECO) PLAN ACCOUNTING

Executive Summary

Senate Bill 1459 passed by the 83rd Legislature of the State of Texas (SB1459) included a mandate that assets and liabilities attributable to members and retirees of the LECOSRF be measured and accounted for in aggregate and separately from ERS main fund for the subsequent biennium. Even though the mandate has passed, the contents of this Appendix outline the measurement of the potential separate accounting for the stand-alone retirement plan for LECO members. The two populations can either have separate accounting for assets and liabilities or be fully separated.

Summary of the Results

Item	Regular Class	Law Enforcement and Custodial Officers
Membership		
• Number of		
- Active members	107,324	39,066
- Retirees and beneficiaries*	86,180	17,578
- Inactive, vested*	14,169	2,428
- Inactive, nonvested*	71,402	20,874
- Total	279,075	79,946
• Valuation Payroll	$ 5,062,778,313	$ 1,743,679,004
Statutory contribution rates		
• Members	9.50%	10.00%
• Employers	0.50%	0.50%
• State	9.50%	10.00%
Total Payroll Contribution Rate	19.50%	20.50%
• Expected contributions from court fees	N/A	$19.2 million per year
Actuarially Sound Rate (funds normal cost and amortizes unfunded accrued liability over 31 years, per Section 811.006 of the Texas Government Code)		
- Total Contribution Rate	19.47%	24.15%
- In addition to Court Fees	19.47%	23.38%
Contribution Rate Sufficiency (Negative figures indicates contribution shortfall)	0.03%	-2.88%
Assets		
• Market value (MVA)	$ 19,977,040,613	$ 5,348,588,734
• Actuarial value (AVA)	$ 21,684,868,128	$ 5,805,796,639
Actuarial Information on AVA (smoothed)		
• Normal cost %	12.11%	14.58%
• Total normal cost	$ 613,102,454	$ 254,228,399
• Actuarial accrued liability	$ 27,987,834,309	$ 8,627,723,554
• Unfunded actuarial accrued liability (UAAL)	$ 6,302,966,181	$ 2,821,926,915
• Funded ratio	77.5%	67.3%
• Funding period (years)	31	Never
Actuarial Information on MVA		
• Unfunded actuarial accrued liability (UAAL)	$ 8,010,793,696	$ 3,279,134,820
• Funded ratio	71.4%	62.0%
• Funding period (years)	62	Never

* Annuitants with at least 10 years of CPO service are identified as LECO annuitants. Inactive members with at least three-fourths of total service certified as CPO service are identified as LECO inactive members. These headcounts are shown for illustration purposes and do not directly relate to the methods used to allocate individual liabilities to the two resulting plans.

Methodology for the LECO Plan

The goal was to re-assemble these plans for LECO members and regular State (non-LECO) employees as if they had been separate plans from the beginning. In broad terms, the methodology for structuring the proposed stand-alone retirement plan for LECO members can be described as: allocation of ERS liabilities, allocation of ERS assets, and addition of LECOSRF.

Allocation of ERS Liabilities

The first step is to determine the plan liabilities for each resulting plan. ERS plan liabilities for currently contributing LECO members were attributed to the new LECO plan. Liabilities for individual annuitants and non-contributing members were attributed to the new LECO plan based on the proportion of their CPO-service relative to their total ERS plan service. The remaining ERS plan liabilities would remain in the regular State (non-LECO) employees plan.

Adjusted Plan Liability for Purposes of Allocating Assets

LECO members are eligible for enhanced benefits at earlier ages with less reduction for early retirement; therefore, these benefits are more valuable than the benefits available to regular State (non-LECO) employees. Even though LECO members received more valuable benefits from the ERS plan, contributions for these members (State contributions and member contributions) to the ERS plan have historically been the same percentage of payroll as the contributions for regular State (non-LECO) employees.

Solely for the purpose of allocating the plan assets, current ERS plan liabilities for LECO members were re-cast, or adjusted, to approximate the plan liabilities as if LECO members received the same benefits as regular State (non-LECO) employees.

Allocation of Assets

Adjusted ERS plan liabilities of annuitants and non-contributing members in both of the resulting plans were fully funded with ERS assets at market value. There is precedence for first allocating assets to retiree liabilities in corporate plan spinoffs. In a sense, retiree liabilities have the highest "demand" for assets since benefit payments are already being made. The remaining assets were allocated evenly across the adjusted ERS plan liabilities for contributing members in both of the resulting plans.

The ratio of actuarial to market value of assets was applied to the market-value asset allocation to arrive at the final actuarial value asset allocation.

Impact of LECOSRF

The final step in allocating the liabilities and assets for a stand-alone plan for LECO members is to combine the allocated LECO liabilities and assets from the ERS plan with the liabilities and assets of the Law Enforcement and Custodial Officer Supplemental Retirement Fund (LECOSRF).

Financing of Restructured Plans

Based on the results of the August 31, 2016 actuarial valuations of the ERS plan and LECOSRF, neither plan was considered actuarially sound. In this context, an actuarially sound retirement plan receives a total contribution rate sufficient to cover the normal cost, administrative expenses, and amortize the unfunded actuarial accrued liability over a period of 31 years, or less.

Based on the allocation of liabilities and assets outlined in this Appendix, the stand-alone regular State (non-LECO) employees plan would be considered actuarially sound as of August 31, 2016 based on an Actuarial Value of Assets basis since the funding period is 31 years. However, the stand-alone LECO plan would not be considered actuarially sound. Based on a market value of assets basis, neither the stand-alone LECO plan nor the regular State (non-LECO) employees plan would be considered actuarially sound as of August 31, 2016.

Administrative Considerations

The asset allocation outlined in this Appendix is only one of many "reasonable" asset allocations. Actuarial standards of practice give guidance on how to assess the actuarial soundness of a proposed allocation, but they do not prescribe a particular methodology for allocation of the assets in a situation such as this. As previously noted, there are detailed rules regarding the allocation of assets in corporate plan spinoffs, but there is very little precedent for public pension plans. There is supporting rationale for this allocation method, but there are other methods which could also be supported.

GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

LAW ENFORCEMENT AND CUSTODIAL OFFICER SUPPLEMENTAL RETIREMENT FUND OF THE EMPLOYEES RETIREMENT SYSTEM OF TEXAS

ANNUAL ACTUARIAL VALUATION – FUNDING
AS OF AUGUST 31, 2016

GRS
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November 17, 2016

Board of Trustees
Employees Retirement System of Texas
200 East 18th Street
Austin, TX 78701

Re: Actuarial Valuation for Funding Purposes as of August 31, 2016

Members of the Board:

We certify that the information contained in this report is accurate and fairly presents the actuarial position of the Law Enforcement and Custodial Officer Supplemental Retirement Fund (LECOSRF) of the Employees Retirement System of Texas as of August 31, 2016. This report was prepared at the request of the Board and is intended for use by ERS staff and those designated or approved by the Board. This report may be provided to parties other than ERS only in its entirety and only with the permission of the Board.

Actuarial Valuation

The primary purposes of the actuarial valuation report are to determine the adequacy of the current State and employer contribution rates, describe the current financial condition of LECOSRF, analyze changes in the condition of LECOSRF, and provide various summaries of the data.

It is important for the Board of Trustees to understand that the currently scheduled member, employer and State contributions are not expected to accumulate sufficient assets in order to pay all of the currently scheduled benefits when due.

Plan Provisions

Our actuarial valuation as of August 31, 2016 reflects the benefit and contribution provisions set forth in Chapters 811 through 815 of the Texas Government Code. The current plan provisions are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. Additionally, the actuarial valuation incorporates the most significant across-the-board pay increases budgeted by the State Legislature for the current biennium. The current actuarial assumptions and methods are outlined in Appendix II of this report.

Data

The valuation was based upon information as of August 31, 2016, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of, where applicable, the Internal Revenue Code and ERISA.

The signing actuaries are independent of the plan sponsor. They are all Enrolled Actuaries, Fellows of the Society of Actuaries, and Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, each of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

R. Ryan Falls, FSA, EA, MAAA
Senior Consultant

Joseph P. Newton, FSA, EA, MAAA
Senior Consultant

Dana Woolfrey, FSA, EA, MAAA
Consultant

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SECTION A

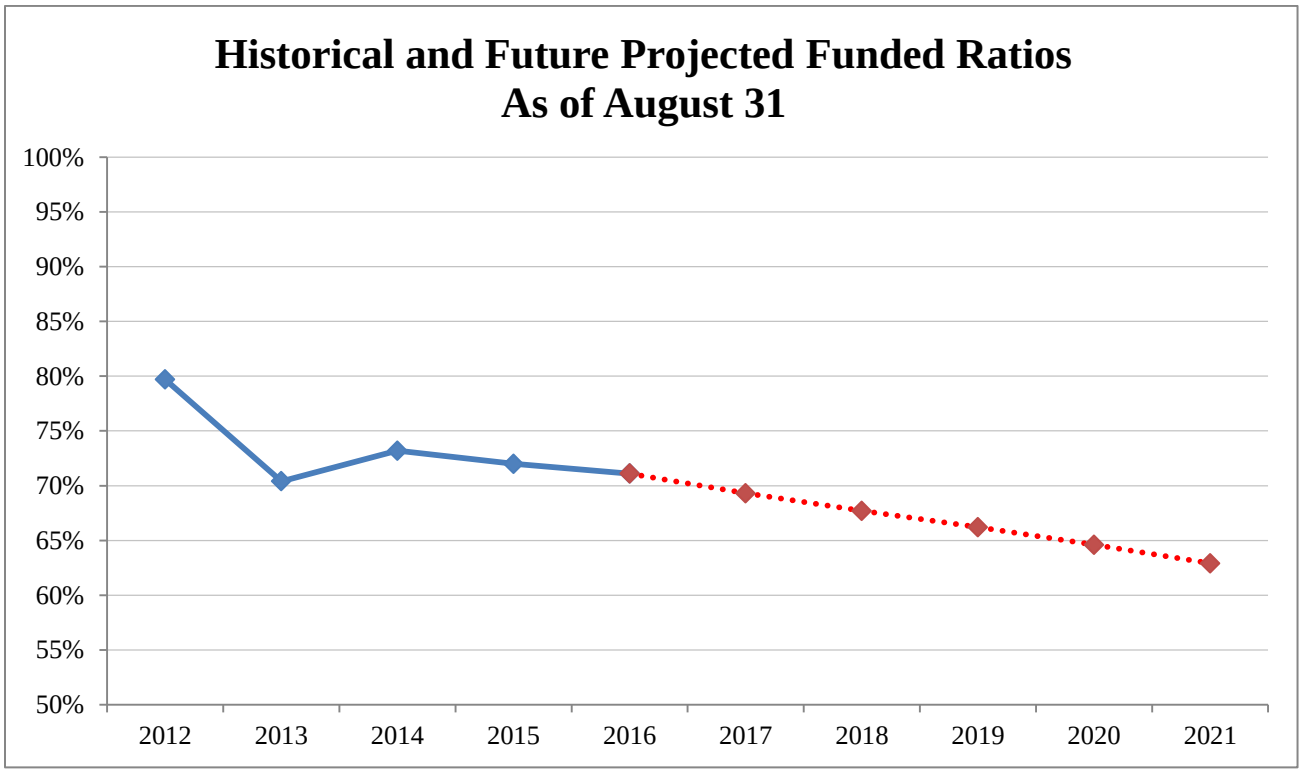
EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Item	2016	2015
Membership		
• Number of		
- Active members	39,066	38,526
- Retirees and beneficiaries	11,515	10,845
- Inactive, vested	95	79
- Inactive, nonvested	15,108	12,883
- Total	65,784	62,333
• Valuation Payroll	$ 1,743,679,004	$ 1,750,709,090
Statutory contribution rates	FY 2017	FY 2016
• Members	0.50%	0.50%
• State	0.50%	0.50%
• Expected contributions from court fees	$19.2 million per year	1.20% of pay
Actuarially Sound Rate (funds normal cost and amortizes unfunded accrued liability over 31 years, per Section 811.006 of the Texas Government Code)		
- Total Contribution Rate	3.10%	3.01%
- In addition to Court Fees	2.33%	1.81%
Assets		
• Market value (MVA)	$ 860,049,223	$ 844,145,332
• Actuarial value (AVA)	$ 933,534,062	$ 909,249,614
• Return on market value*	5.3%	0.5%
• Return on actuarial value	5.9%	6.1%
Actuarial Information on AVA - smoothed		
• Normal cost %	1.81%	1.77%
• Total normal cost	$ 31,560,590	$ 30,987,551
• Actuarial accrued liability	$ 1,312,392,501	$ 1,262,311,389
• Unfunded actuarial accrued liability (UAAL)	$ 378,858,439	$ 353,061,775
• Funded ratio	71.1%	72.0%
• Funding period (years)	Never	Never
Actuarial Information on MVA		
• Unfunded actuarial accrued liability (UAAL)	$ 452,343,278	$ 418,166,057
• Funded ratio	65.5%	66.9%

* Provided by ERS Master Trust Custodian

The following chart illustrates the recent history and outlook of the funded status of LECOSRF over the next five years:



August 31,	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Funded Ratio	79.7%	70.4%	73.2%	72.0%	71.1%	69.3%	67.7%	66.1%	64.5%	62.9%
UAAL (in millions)	$212	$354	$323	$353	$379	$422	$464	$509	$556	$606
ASC*	2.86%	3.09%	2.96%	3.01%	2.33%	2.44%	2.56%	2.67%	2.78%	2.88%

* For 2016 and thereafter, the stated Actuarially Sound Contribution rate is the contribution necessary to be actuarially sound based on the 31-year standard in addition to expected annual contribution of $19.2 million from court fees. Prior to 2016, the expected court fees were included in the ASC as 1.20% of pay.

The projections beyond 2016 are based on the same assumptions, methods and provisions used for the August 31, 2016 valuation, which include the most significant across-the-board pay increases budgeted by the State Legislature and the assumptions adopted by the Board in February 2013. Additionally, the market value of assets is expected to earn 8% per year.

It is important for the Board of Trustees to understand that the currently scheduled member, employer and State contributions are not expected to accumulate sufficient assets in order to pay all of the currently scheduled benefits when due. Based on current expectations and assumptions, LECOSRF is projected to remain solvent until the year 2043, after which the funding would revert to a pay-as-you-go status. Therefore, for the current benefit structure to be sustainable, the contribution levels will need to be increased further.

Given this outlook, we recommend the Legislature continue to make further increases in the contribution rates (State, employer, and/or member) to LECOSRF to improve the overall financial health of the retirement system.

SECTION B

DISCUSSION

DISCUSSION

Introduction

The results of the August 31, 2016 actuarial valuation of the Law Enforcement and Custodial Officer Supplemental Retirement Fund (LECOSRF) of the Employees Retirement System of Texas are presented in this report.

The primary purposes of this actuarial valuation report are to determine the adequacy of the current State and employer contribution rates, describe the current financial condition of LECOSRF, analyze the changes in the condition of LECOSRF, and provide various summaries of the data.

The total contribution rate for the current fiscal year exceeds the normal cost by 0.29% of payroll, but it is not sufficient to amortize the unfunded actuarial accrued liability (UAAL) over a finite period of time. As a result, the UAAL is expected to grow indefinitely and the funding objective is not currently being realized. Based on current expectations and assumptions, LECOSRF is projected to remain solvent until the year 2043, after which the funding would revert to a pay-as-you-go status. Therefore, for the current benefit structure to be sustainable, the contribution levels will need to be increased further.

All of the tables referenced in the following discussion appear in Section C of this report.

Plan Provisions

There were no changes to the plan provisions during the past year. The current plan provisions are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. We did not perform an independent analysis of the actuarial assumptions. We believe the assumptions are internally consistent and are reasonable, based on the actual experience of LECOSRF.

The actuarial valuation as of August 31, 2016 incorporates the most significant across-the-board pay increases budgeted by the State Legislature for the current biennium. Specifically, CPO/COs that are covered by State of Texas Salary Schedule C were assumed to receive increases in accordance with the schedule (which generally result in no increase on September 1, 2016). Finally, CPO/COs employed by the Texas Department of Criminal Justice were assumed to receive no across-the-board increase on September 1, 2016.

The results of the actuarial valuations are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. A review of the impact of a different set of assumptions on the funded status of LECOSRF is outside the scope of this actuarial valuation.

The current actuarial assumptions are outlined in Appendix II of this report.

Funding Adequacy

The funding objective of LECOSRF is to fund the sum of the normal cost and the amount necessary to amortize any unfunded actuarial accrued liability over a period that does not exceed 30 years by one or more years. Contribution rates should be established which, over time, will primarily remain level as a percent of payroll.

The member contribution rates are established by State statute and the State contribution rate is set by State statute and legislative appropriation. For the fiscal year beginning September 1, 2016, members contribute 0.50% of payroll and the State contributes 0.50% of payroll. LECOSRF also receives a portion of the court costs collected under Section 133.102 of the Local Government Code. Based on information provided by ERS, the contribution from this source is expected to be approximately $19.2 million for fiscal year 2017 and all subsequent years. It should be noted that level dollar court cost contributions in future years will result in total contributions that are not expected to remain level as a percent of payroll over time. For fiscal year 2017, the court fee contribution is approximately 1.10% of payroll.

The UAAL of LECOSRF increased from $353 million as of August 31, 2015 to $379 million as of August 31, 2016. Additionally, the funded ratio of LECOSRF decreased from 72.0% to 71.1% as of August 31, 2016. The funded status is one of many metrics used to show trends and develop future expectations about the health of a retirement system. The funded status measure itself is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions since it does not reflect normal cost contributions, the timing of amortization payments, or future experience other than expected.

The valuation shows that the total normal cost for funding purposes is 1.81% of payroll. The approximate total contribution rate is 2.10% of payroll for the current fiscal year. The total contribution rate for the current fiscal year exceeds the normal cost by 0.29% of payroll, but it is not sufficient to amortize the UAAL over a finite period of time. As a result, the UAAL is expected to grow indefinitely and the funding objective is not currently being realized.

Section 811.006 of the Texas Government Code limits the modifications to LECOSRF that would, essentially, increase benefits or lower contributions to the trust unless the current level of benefits and contributions are considered actuarially sound. Section 811.006 defines actuarially sound as a

retirement system that is receiving a total contribution rate sufficient to cover the normal cost, administrative expenses, and amortize the UAAL over a period of 31 years, or less. Based on the actuarial valuation as of August 31, 2016, the actuarially sound contribution (ASC) rate for LECOSRF is 3.10% of payroll in addition to the annual court cost contribution of $19.2 million.

As noted, the ASC is currently calculated based on a 31-year open amortization period. This means that the ASC contribution will always be calculated with the same 31-year period and the UAAL would never completely disappear. Even though the contributions to LECOSRF are not based on this ASC, the Board may want to consider adopting a funding policy that includes an ultimate goal of eliminating the UAAL by a certain date. This type of funding policy will allow the Board to better assess the level of contributions received from the employers and the State.

System Assets

This report contains several tables that summarize key information with respect to the LECOSRF assets.

The total market value of assets increased from $844 million to $860 million as of August 31, 2016. Table 5 reconciles the changes in the fund during the year. Total contributions increased from $35.1 million to $37.0 million. Contributions for fiscal year 2017 are anticipated to be approximately 2.10% of pay. Contributions in subsequent years are expected to increase in dollar amount, but at a declining percentage of pay since contributions from court costs are expected to remain level.

Table 6 shows the development of the actuarial value of assets. Rather than use the LECOSRF market value of assets, the valuation reflects a smoothed asset value. This actuarial value is calculated by immediately reflecting 20% of the difference between the expected actuarial value and the current market value. The actuarial value is currently 8.5% more than the market value.

The approximate investment return for the fiscal year ending August 31, 2016 was 5.3% when measured on market value and 5.9% when measured on actuarial value. Table 7 shows a history of return rates. The LECOSRF ten-year average market return, net of investment expenses as reported by the ERS Master Trust Custodian, is 5.8%.

Table 8 provides a history of the contributions paid into LECOSRF and the administrative expenses and benefit payments that have been paid out of LECOSRF. This table shows that LECOSRF paid administrative expenses and benefit payments, in excess of contributions received, of $27.6 million (or 3.3% of assets) in fiscal year 2015 and that amount was $28.9 million (or 3.4% of assets) in fiscal year 2016. ERS should continue to monitor this deficit as it could impact the future liquidity needs of LECOSRF.

Data

The valuation was based upon information as of August 31, 2016, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

The tables in Appendix III show key census statistics for the various groups included in the valuation.

SECTION C

TABLES

Development of Employer Cost

	August 31, 2016	August 31, 2015
1. Payroll		
a. Reported Payroll (August Payroll of Active Members)	$ 1,743,679,004	$ 1,616,433,303
b. Valuation Payroll (Expected Covered Payroll for Following Plan Year)	1,743,679,004	1,750,709,090
2. Total Normal Cost Rate		
a. Gross normal cost rate	1.71%	1.67%
b. Administrative expenses	0.10%	0.10%
c. Total (Item 2a + Item 2b)	1.81%	1.77%
3. Actuarial Accrued Liability for Active Members		
a. Present value of future benefits for active members	$ 882,442,051	$ 864,718,270
b. Less: present value of future normal costs	(198,521,400)	(188,751,937)
c. Actuarial accrued liability	$ 683,920,651	$ 675,966,333
4. Total Actuarial Accrued Liability for:		
a. Retirees and beneficiaries	$ 618,987,770	$ 578,926,025
b. Inactive members	9,484,080	7,419,031
c. Active members (Item 3c)	683,920,651	675,966,333
d. Total	$ 1,312,392,501	$ 1,262,311,389
5. Actuarial Value of Assets	$ 933,534,062	$ 909,249,614
6. Unfunded Actuarial Accrued Liability (UAAL) (Item 4d - Item 5)	$ 378,858,439	$ 353,061,775
7. Amortization of UAAL Over 31 Years as a Level Percentage of Payroll	1.29%	1.24%
8. Total Contribution Rate Needed to Fund Normal Cost Plus Amortize the UAAL Over 31 Years (Item 2c + Item 7)	3.10%	3.01%
9. Expected Contribution from Court Fees		
a. Expected level of contributions	$19.2 million per year	1.20% of pay
b. Expected contribution for fiscal year	$ 19,200,000	$ 21,008,509
c. Equivalent contribution rate for fiscal year	1.10%	1.20%
10. Contribution Rate In Addition to Expected Court Fees Needed to Fund Normal Cost Plus Amortize the UAAL Over 31 Years	2.33%	1.81%
11. Allocation of Contribution Rate for the Current Fiscal Year		
a. Equivalent employer rate for fiscal year*	1.60%	1.70%
b. Member rate	0.50%	0.50%
c. Total contribution rate for fiscal year*	2.10%	2.20%
d. Total normal cost rate	1.81%	1.77%
e. Available contribution rate to amortize UAAL	0.29%	0.43%
f. Total contribution rate for fiscal year*	2.10%	2.20%
12. Funding period based on statutory contribution rates, expected court fees, and Actuarial Value of Assets (years)	Never	Never

* The annual court fees contributed to LECOSRF are expected to remain level in the future. As a result, the equivalent contribution rate is expected to decrease over time as the payroll increases.

Actuarial Present Value of Future Benefits

		August 31, 2016	August 31, 2015
1.	Active Members		
	a. Service Retirement	$ 853,320,981	$ 837,392,693
	b. Disability Benefits	9,032,240	8,820,668
	c. Death Before Retirement	7,297,649	7,209,091
	d. Termination	12,791,181	11,295,818
	e. Total	$ 882,442,051	$ 864,718,270
2.	Inactive Members	$ 9,484,080	$ 7,419,031
3.	Annuitants	$ 618,987,770	$ 578,926,025
4.	Total Actuarial Present Value of Future Benefits	$ 1,510,913,901	$ 1,451,063,326

Analysis of Normal Cost

	August 31, 2016	August 31, 2015
1. Gross Normal Cost Rate		
a. Service Retirement	1.53%	1.49%
b. Disability Benefits	0.03%	0.03%
c. Death Before Retirement	0.02%	0.02%
d. Termination	0.13%	0.13%
e. Total	1.71%	1.67%
2. Administrative Expenses	0.10%	0.10%
3. Total Normal Cost	1.81%	1.77%
4. Less: Member Rate	0.50%	0.50%
5. Employer Normal Cost Rate	1.31%	1.27%

Historical Summary of Active Member Data

	Active Members		Covered Payroll		Average Salary			
Valuation as of August 31,	Number	Percent Increase	Amount in $ Millions	Percent Increase	$ Amount	Percent Increase	Average Age	Average Service
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2008	33,642	N/A	1,245	N/A	37,021	N/A	42.7	9.6
2009	37,819	12.4%	1,387	11.4%	36,687	-0.9%	42.0	8.6
2010	39,052	3.3%	1,483	6.9%	37,979	3.5%	41.9	8.5
2011	36,806	-5.8%	1,452	-2.1%	39,454	3.9%	42.2	8.9
2012	37,404	1.6%	1,475	1.6%	39,444	0.0%	42.5	9.1
2013	37,415	0.0%	1,477	0.1%	39,469	0.1%	42.4	9.1
2014	37,084	-0.9%	1,542	4.4%	41,584	5.4%	42.3	8.9
2015	38,526	3.9%	1,616	4.8%	41,957	0.9%	41.7	8.4
2016	39,066	1.4%	1,744	7.9%	44,634	6.4%	41.0	8.0

Reconciliation of Plan Net Assets

	Year Ending	
	August 31, 2016	August 31, 2015
	(1)	(2)
1. Market value of assets at beginning of year	$ 844,145,332	$ 869,877,651
2. Revenue for the year		
a. Contributions for the year		
i. State (including membership fees)	$ 27,497,297	$ 26,728,318
ii. Member (including penalty interest)	9,538,658	8,376,472
iii. Total	$ 37,035,955	$ 35,104,790
b. Net investment income	$ 44,831,113	$ 1,918,490
c. Total revenue	$ 81,867,068	$ 37,023,280
3. Disbursements for the year		
a. Benefit payments and refunds	64,541,719	$ 61,344,037
b. Net transfers from TRS	0	0
c. Administrative expenses	1,421,458	1,411,562
d. Total expenditures	65,963,177	62,755,599
4. Increase in net assets (Item 2c - Item 3d)	$ 15,903,891	$ (25,732,319)
5. Market value of assets at end of year (Item 1 + Item 4)	$ 860,049,223	$ 844,145,332

Development of Actuarial Value of Assets

		Year Ending August 31, 2016
1. Actuarial value of assets at beginning of year	$	909,249,614
2. Net new investments		
a. Contributions for the year (Table 5)	$	37,035,955
b. Disbursements for the year (Table 5)		(65,963,177)
c. Subtotal		(28,927,222)
3. Assumed investment return rate		8.00%
4. Expected return	$	71,582,880
5. Expected actuarial value of assets at end of year (Item 1 + Item 2c + Item 4)	$	951,905,272
6. Market value of assets at end of year	$	860,049,223
7. Excess earnings/(shortfall) (Item 6 - Item 5)	$	(91,856,049)
8. Excess earnings/(shortfall) recognized (20% x Item 7)	$	(18,371,210)
9. Actuarial value of assets (Item 5 + Item 8)	$	933,534,062
10. Estimated rate of return		5.9%
11. Actuarial value as percentage of market value		108.5%

History of Investment Return Rates

Year Ending August 31 of	Market*	Actuarial
(1)	(2)	(3)
2003	9.2%	5.2%
2004	11.7%	6.3%
2005	12.7%	7.4%
2006	8.8%	7.6%
2007	13.9%	8.5%
2008	-4.6%	5.7%
2009	-6.6%	3.2%
2010	6.7%	3.7%
2011	12.6%	5.1%
2012	8.2%	5.4%
2013	10.1%	6.1%
2014	14.7%	7.6%
2015	0.5%	6.1%
2016	5.3%	5.9%
Average Returns		
Last Five Years:	7.7%	6.2%
Last Ten Years:	5.8%	5.7%

* Market Value Rates of Return provided by the ERS Master Trust Custodian.

History of Cash Flow

Year Ending August 31,	Contributions	Distributions and Expenditures: Benefit Payments and Refunds	Distributions and Expenditures: Administrative Expenses	Distributions and Expenditures: Total	External Cash Flow for the Year	Market Value of Assets	External Cash Flow as Percent of Market Value
(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)
2007	$ 0.0	$ (32.1)	$ (0.5)	$ (32.6)	$ (32.6)	$ 762.9	-4.3%
2008	20.2	(34.9)	(0.4)	(35.3)	(15.1)	704.9	-2.1%
2009	20.7	(38.7)	(0.4)	(39.1)	(18.4)	634.8	-2.9%
2010	35.3	(41.2)	(0.6)	(41.8)	(6.5)	668.4	-1.0%
2011	31.8	(43.7)	(0.9)	(44.6)	(12.8)	737.4	-1.7%
2012	7.3	(48.1)	(0.8)	(48.9)	(41.6)	747.7	-5.6%
2013	14.3	(52.4)	(0.8)	(53.2)	(38.9)	780.7	-5.0%
2014	35.9	(57.1)	(1.3)	(58.4)	(22.5)	869.9	-2.6%
2015	35.1	(61.3)	(1.4)	(62.7)	(27.6)	844.1	-3.3%
2016	37.0	(64.5)	(1.4)	(65.9)	(28.9)	860.0	-3.4%

Dollar amounts in millions

Column (7) = Column (2) + Column (6).

Total Experience Gain or Loss

Item		Year Ending August 31, 2016	Year Ending August 31, 2015
(1)		(2)	(3)
A. Calculation of total actuarial gain or loss			
1. Unfunded actuarial accrued liability (UAAL), previous year		$ 353,061,775	$ 323,174,989
2. Normal cost for the year (excluding administrative expenses)		29,236,842	26,878,492
3. Actual administrative expenses		1,421,458	1,411,562
4. Contributions for the year (excluding service purchases)		(36,180,288)	(34,305,834)
5. Interest at 8%			
a. On UAAL		$ 28,244,942	$ 25,853,999
b. On normal cost and administrative expenses		1,226,332	1,131,602
c. On contributions		(1,447,212)	(1,372,233)
d. Total		$ 28,024,062	$ 25,613,368
6. Assumption change (Gains)/Losses		$ 0	$ 0
7. Legislative changes		0	3,971,918
8. Expected UAAL (Sum of Items 1 through 7)		375,563,849	346,744,495
9. Actual UAAL		378,858,439	353,061,775
10. Total (gain)/loss for the year (Item 9 - Item 8)		$ 3,294,590	$ 6,317,280
B. Source of gains and losses	% of AAL		
11. Asset (gain)/loss for the year	1.40%	$ 18,371,210	$ 16,276,071
12. Pay Increases (Less)/Greater than Expected	0.31%	(4,012,226)	(9,827,645)
13. Non-Retired Demographic (Gains)/Losses	0.95%	(12,523,340)	(6,594,024)
14. Post-Retirement Mortality (Gains)/Losses	0.02%	214,071	61,539
15. Other Demographic (Gains)/Losses	0.09%	1,244,875	6,401,339
16. Total (Sum of Items 11 through 15)	0.25%	$ 3,294,590	$ 6,317,280

Solvency Test

Actuarial Accrued Liability and Percent of Active Member Payroll for:

	Accumulated Member Contributions Including Interest		Retirees and Beneficiaries Currently Receiving Benefits		Employer Financed Portion of Vested and Nonvested Benefits			Portion of Accrued Liabilities Covered by Assets		
August 31,	(1)	% of Payroll	(2)	% of Payroll	(3)	% of Payroll	Actuarial Value of Assets	(1)	(2)	(3)
2007	$ 0.0	0%	$ 278.1	22%	$ 484.6	9%	$ 747.8	100%	100%	97%
2008	0.0	0%	314.6	25%	527.5	42%	774.5	100%	100%	87%
2009	0.0	0%	334.6	24%	572.5	41%	780.8	100%	100%	78%
2010	7.3	0%	368.0	25%	591.3	40%	802.9	100%	100%	72%
2011	13.9	1%	400.9	28%	578.0	40%	830.5	100%	100%	72%
2012	19.5	1%	447.5	30%	577.3	39%	832.5	100%	100%	63%
2013	24.4	2%	482.7	33%	690.0	47%	843.0	100%	100%	49%
2014	29.5	2%	533.3	35%	644.0	42%	883.6	100%	100%	50%
2015	34.5	2%	578.9	36%	648.9	40%	909.2	100%	100%	46%
2016	41.5	2%	619.0	35%	651.9	37%	933.5	100%	100%	42%

Note: Dollar amounts in millions

APPENDICES

SUMMARY OF PLAN PROVISIONS FOR LAW ENFORCEMENT AND CUSTODIAL OFFICER SUPPLEMENTAL RETIREMENT FUND OF THE EMPLOYEES RETIREMENT SYSTEM OF TEXAS

Classes of Membership

1. Elected Class Membership:
    a. Membership is optional and limited to:
        i. Elected state officials not covered by either of the Judicial Retirement Systems
        ii. Members of the Legislature; and
        iii. District and Criminal District Attorneys paid by the state general revenue fund.
2. Employee Class Membership:
    a. Membership is mandatory for all employees and appointed officers of every department, commission, board, agency, or institution of the state except for:
        i. Independent contractors;
        ii. Persons covered by the Teacher Retirement System or either of the Judicial Retirement System; and
        iii. Employee Class Members already receiving retirement benefits under the System.
    b. Includes two types of Employee Class service
        i. CPO/CO: Certified Peace Officer / Custodial Officer – in general, service rendered while a law enforcement officer, custodial officer, parole officer or caseworker
        ii. Regular: Non-CPO/CO service.
    c. Prior to September 1, 2015, membership begins after a 90-day waiting period. Effective September 1, 2015, membership begins immediately.
    d. CPO/CO Service is required in order to have a benefit payable from this fund.

The benefits payable by the Law Enforcement and Custodial Officer Supplemental Retirement Fund (LECOSRF) only apply to members that have accrued CPO/CO service.

Member Contributions

1. 0.5% of compensation to LECOSRF in addition to contributions payable to ERS. Additional member contributions may be allowable for service purchases.
2. Member contributions cease when a member's benefit accrual has reached 100% of Average Monthly Compensation.
3. Member contributions accumulate interest at 2.00% per year.

State of Texas Contributions

State contributions are set biennially by the legislature. The current sources of contributions are shown below.

1. *Payroll Contributions*: The current projected contribution rate for the State is 0.50% of compensation for the 2014 and 2015 fiscal years. State payroll contributions cease when a member's benefit accrual has reached 100% of Average Monthly Compensation.
2. *Court Fees*: LECOSRF also receives a portion of the court costs collected under Section 133.102 of the Local Government Code. Based on historical information, the contribution from this source is expected to be approximately $19.2 million for fiscal year 2017.

State contributions after the 2015 fiscal year are subject to future legislative appropriations.

Compensation

Compensation includes base salary, longevity and hazardous duty pay and excludes overtime pay. This amount is limited by Section 401(a)(17) of the Internal Revenue Code for members hired after August 31, 1996.

Average Monthly Compensation (AMC)

1. *Members hired prior to September 1, 2009*: Average of the 36 highest months of compensation for service in the employee class of membership
2. *Members hired on or after September 1, 2009 and prior to September 1, 2013*: Average of the 48 highest months of compensation for service in the employee class of membership
3. *Members hired on or after September 1, 2013*: Average of the 60 highest months of compensation for service in the employee class of membership.

Creditable Service

The types of service creditable in LECOSRF are membership service, military service and equivalent membership service. Equivalent membership service includes: previously cancelled service, service not previously established, waiting period service, and Additional Service Credit.

Unused Sick and Annual Leave

In many cases, unused sick and annual leave can be used to establish Creditable Service. Members hired prior to September 1, 2009 can use unused sick and annual leave to satisfy service requirements for Retirement and Death Benefit Plan eligibility as well as to calculate plan benefits. Members hired on or after September 1, 2009 can only use unused sick and annual leave to calculate plan benefits. However, members hired on or after September 1, 2013 cannot use unused annual leave to calculate plan benefits if the member opts to receive the unused annual leave as a lump-sum payment.

Service Retirement Supplement

1. Employee Class:
   a. *Eligibility*:
      i. Any age with 20 years of CPO/CO Service
   b. *Benefits:* 0.5% of AMC times years of CPO/CO Service
   c. *Applicable Reductions*
      i. For members hired prior to September 1, 2009, retiring after attaining age 50 or after attaining Rule of 80, there is no reduction. Otherwise, the member receives the percentage of the benefit stated in the following table:

Attained Age at Retirement	Reduction Percentage	Attained Age at Retirement	Reduction Percentage
36	31.2%	43	55.3%
37	33.9%	44	60.1%
38	36.7%	45	65.3%
39	39.8%	46	71.1%
40	43.2%	47	77.3%
41	46.9%	48	84.2%
42	50.9%	49	91.7%

      ii. For members hired after on or after September 1, 2009, but prior to September 1, 2013, reduced five percent for each year the member retires prior to age 55, with a maximum possible reduction of 25 percent.
      iii. For members hired on or after September 1, 2013, reduced five percent for each year the member retires prior to age 57, with no maximum possible reduction.
2. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Standard Non-Occupational Disability Annuity: None.

Standard Occupational Disability Annuity*:*

1. Employee Class (CPO/CO Members):
    a. *Eligibility*: Disability as a direct result of some risk or hazard inherent to law enforcement or custodial duties
        i. Total: Incapable of substantial gainful activity and eligible for Social Security disability benefits
        ii. Non-total: Does not satisfy definition of Total Disability
    b. *Benefits:*
        i. Non-total with less than 20 years of CPO/CO Service: 15% of AMC payable from LECOSRF
        ii. Non-total with 20 years of CPO/CO Service: Benefit defined in the Service Retirement Supplement Section
        iii. Total: 100% of AMC offset by the amount paid by ERS (ERS pays 2.3% of AMC times years of Creditable Service, but not less than 35% of AMC)
2. Normal Form of Payment: Annuity payable for life or until member is no longer incapacitated for the performance of duty. Any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Death Benefit Plan (DBP) Annuity Supplement

1. Eligibility:
    a. 20 years of CPO/CO Service; and
        i. Death occurs while an active member; or
        ii. Death occurs while an inactive member, and the member either:
            1. Filed a DBP prior to September 1, 2006; or
            2. Was eligible for service retirement when the member became inactive.
2. Benefits: Benefits are calculated as if the member had elected to receive a Service Retirement Supplement under an optional form of payment, received a Service Retirement Supplement, and died immediately thereafter.

Deferred Service Retirement Annuity

1. Employee Class:
   a. *Eligibility*:
      i. 20 years of CPO/CO service at termination of CPO/CO employment, and either;
         1. The member transfers to and retires from active regular class service; or
         2. The member terminates all employee class service, and the regular employee class account balance is not withdrawn from the ERS trust
   b. *Benefits:*
      i. Service Retirement Supplement, based on the member's age at benefit commencement. AMC used in calculating the benefit payable from the ERS trust and the LECOSRF will both be based on all employee class service.
      ii. Payments may commence at any age, provided that the member has terminated all employee class service. The member must retire simultaneously from the regular employee class and the CPO/CO employee class.
2. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Refund of Accumulated Contributions

A refund of accumulated contributions is payable in cases where a terminated member did not meet the eligibility requirements for an annuity, or a terminated member chooses to receive a refund of his or her account balance in lieu of an annuity.

Maximum Benefits

Annuity benefits are limited to 100% of Average Monthly Compensation. For members with CPO/CO service, this benefit limitation includes benefits from all sources (ERS and LECOSRF).

Limit on Plan Modifications

According to Section 811.006 of the Texas Government Code – a rate of member or State contributions to or a rate of interest required for the establishment of credit in the retirement system may not be reduced or eliminated, a type of service may not be made creditable in the retirement system, a limit on the maximum permissible amount of a type of creditable service may not be removed or raised, a new monetary benefit payable by the retirement system may not be established, and the determination of the amount of a monetary benefit from the system may not be increased, if, as a result of the particular action, the time, as determined by an actuarial valuation, required to amortize the UAAL of the retirement system would be increased to a period that exceeds 30 years by one or more years.

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation that covered the five-year period from September 1, 2006 through August 31, 2011.

I. Valuation Date

The valuation date is August 31 of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

Because the employer contribution rate is set by statute, the actuarial valuation is used to determine the adequacy of the current State and employer contribution rates and describe the current financial condition of LECOSRF.

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the first step is to determine the contribution rate (level as a percentage of pay) required to provide the benefits to each member, or the normal cost rate. The normal cost rate consists of two pieces: (i) the member's contribution rate, and (ii) the remaining portion of the normal cost rate which is the employer's normal cost rate. The total normal cost rate is based on the benefits payable to a new member and the entry age characteristics of the current active membership.

The Unfunded Actuarial Accrued Liability (UAAL) is the liability for future benefits which is in excess of (i) the actuarial value of assets, and (ii) the present value of future normal costs. The employer contribution provided in excess of the employer normal cost is applied to amortize the UAAL.

The funding period is calculated as the number of years required to fully amortize the UAAL, assuming that: (a) future market earnings, net of investment-related expenses, will equal 8.00% per year, (b) there will be no liability gains/losses or changes in assumptions, (c) the number of active members will remain unchanged, (d) active members who leave employment will be replaced by new entrants each year, and (e) State contributions will remain the same percentage of payroll as the current fiscal year.

The Entry Age actuarial cost method is an "immediate gain" method (i.e., experience gains and losses are separately identified as part of the UAAL). However, they are amortized over the same period applied to all other components of the UAAL.

III. *Actuarial Value of Assets*

The actuarial value of assets is determined as the expected value of plan assets as of the valuation date plus 20% of the difference between the market-related value and the expected value. The expected value equals the actuarial value of plan assets as of the prior valuation date, plus contributions, less benefit payments and administrative expenses, all accumulated at the assumed rate of interest to the current valuation date.

IV. *Actuarial Assumptions*

Investment Return: 8.00% per year, net of investment-related expenses (composed of an assumed 3.50% inflation rate and a 4.50% real rate of return)

Administrative Expenses: 0.10% of valuation payroll per year

Salary Increases: Increases are assumed to occur at the beginning of the valuation year and vary by employee group. The components of the annual increases are:

Employee Group	Inflation *	Real Wage Growth	Merit, Promotion and Longevity
Employee Class	3.5%	0%	See sample rates

* Total liabilities for this valuation reflect all known pay increases appropriated by the State legislature for the biennium.

Sample Rates:

Annual Salary Increases for Merit, Promotion and Longevity Male and Female CPO/CO Employee Class Members							
	Years of ERS Decrement Service						
Age	0	1	2	3	4	5 - 9	10+
All	8.00 %	5.00 %	4.50 %	4.00 %	3.50 %	2.00 %	1.50 %

Payroll Growth: 3.50% per year, compounded annually (for projecting valuation payroll).

Age and Service Assumptions and Methods:

Rounding of ages:

Current and projected ages rounded to the nearest year are used for all purposes – determining eligibility for benefits, present value factors, early retirement reductions, option factors, salary increase rates, and decrements.

Benefit Service:

Current Benefit Service in years and months as of the valuation date was provided by ERS. This service plus Future Earned Service, Service Credit at Retirement, and Eligibility Service at Retirement were used to project benefit amounts.

Future Earned Service:

Active members were assumed to earn one additional year of service credit in each future year employed based on their current class of membership (but not beyond the amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

Service Credit at Retirement:

For members hired before September 1, 2009, service credit when eligible for service retirement is assumed to be increased by:

- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 18 years; and
- 0.5 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 18 years.

(but not beyond the amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

For members hired on or after September 1, 2009, service credit when eligible for service retirement is assumed to be increased by:

- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 19 years; and
- 0.5 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 19 years.

(but not beyond the amount of credit needed to provide a 100% of average monthly compensation standard service retirement annuity).

Service for Decrements:

The method of calculating ERS Decrement Service and CPO/CO Decrement Service on the valuation date is shown below. Decrement service is assumed to increase by one year for each future year employed based on their current class of membership.

- Valuation Age: Age rounded to the nearest year on valuation date
- ERS Benefit Service: Years and months of all creditable ERS service on the valuation date
- CPO/CO Benefit Service: Years and months of creditable CPO/CO service on the valuation date
- Date 1: (Valuation Date) minus (ERS Benefit Service)
- ERS Decrement Service: (Valuation Age) minus (age rounded to nearest year on Date 1)
- ERS Funding Entry Age (age at hire for the entry age normal cost method): (Valuation Age) minus (ERS Decrement Service)
- Date 2: (Valuation date) minus (CPO/CO Benefit Service)
- CPO/CO Decrement Service: (Valuation Age) minus (age rounded to nearest year on Date 2)

Eligibility Service at Retirement:

For members hired before September 1, 2009, eligibility service is assumed to be increased by the following to reach eligibility for service retirement:

- 2.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is greater than or equal to 78;
- 1.0 years for members retiring from regular employee class service if age plus service, prior to adjustment, is less than 78;
- 2.0 years for members retiring from CPO/CO class if service, prior to adjustment, is at least 18 years; and
- 1.0 years for members retiring from CPO/CO class if service, prior to adjustment, is less than 18 years.

For members hired on or after September 1, 2009, eligibility service is assumed to be increased by the following to reach eligibility for service retirement:

- 1.0 years for members retiring from regular employee class service ; and
- 1.0 years for members retiring from CPO/CO class service.

Decrement Timing: All decrements – mortality, service retirement, disability retirement, and termination of employment for reasons other than death or retirement – are assumed to occur at the beginning of the valuation year.

Mortality Decrements:

Active Members, Service Retirees, Beneficiaries, and Inactive Members

1994 Group Annuity Mortality with no setback for males and set forward two years for females. Generational mortality improvements in accordance with Scale AA are projected from the year 2000.

Disability Retirees

RP-2000 Disabled Retiree Mortality set forward six years for males and setback one year for females.

Occupational Death

2.0% of male and 0.3% of female active member deaths are assumed to be occupational.

Service Retirement Decrements: Graded tables based on ERS experience.

Active CPO/CO Employee Class Members – hired before September 1, 2009

CPO/CO Decrement Service is used to determine when the rates apply:

- Any age with 18 years of CPO/CO service
- Age 55 with nine years of CPO/CO service

Sample rates for eligible members:

Annual Service Retirement Rates per 100 Participants CPO/CO Employee Class Members - Male and Female						
	Years of CPO/CO Decrement Service					
Age	5	10	15	20	25	30
50				45	55	55
51				30	30	30
52				30	30	30
53				30	30	30
54				30	30	30
55		12	12	45	35	35
56		10	10	45	35	35
57		10	10	45	45	45
58		10	10	45	35	35
59		13	13	45	35	35
60	6	16	16	55	35	35
65	15	35	35	50	60	60
70	50	50	50	50	50	50
75	100	100	100	100	100	100

Active CPO/CO Employee Class Members – hired on or after September 1, 2009

CPO/CO Decrement Service is used to determine when the rates apply:

- Any age with 19 years of CPO/CO service
- Age 55 with nine years of CPO/CO service

Sample rates for eligible members:

Annual Service Retirement Rates per 100 Participants CPO/CO Employee Class Members - Male and Female						
	Years of CPO/CO Decrement Service					
Age	5	10	15	20	25	30
50				5	5	5
51				5	5	5
52				5	5	5
53				5	5	5
54				5	5	5
55		12	12	82.5	65	65
56		10	10	37.5	30	30
57		10	10	37.5	37.5	37.5
58		10	10	37.5	30	30
59		13	13	37.5	30	30
60		16	16	55	35	35
65		35	35	50	60	60
70		50	50	50	50	50
75	100	100	100	100	100	100

Disability Retirement Decrements: Graded Tables Based on ERS Experience

Active CPO/CO Employee Class Members

ERS Decrement Service and CPO/CO Decrement Service are used to determine when the rates apply:

- The rates do not apply before a member is eligible for the benefit.
- Service greater than zero is required for occupational disability retirement.
- 10 years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60, if hired before September 1, 2009, or age 65, if hired on or after September 1, 2009.

Sample rates for members:

Annual Disability Rates per 100 Participants CPO/CO Employee Class Members	
Age	Males and Females
30	0.0123
35	0.0418
40	0.0781
45	0.1307
50	0.2365
55	0.3280
60	0.4200

95% of the disability rates stated above are assumed to be attributable to non-occupational disabilities, 4% are assumed to be attributable to non-total occupational disabilities, and 1% are assumed to be attributable to total occupational disabilities.

Termination Decrements for Reasons Other Than Death or Retirement: Graded Tables Based on ERS Experience.

Rates of termination are zero for members eligible for service retirement.

Sample rates for members not eligible for service retirement:

Active CPO/CO Employee Class Members – hired before September 1, 2009

Annual Rates of Termination per 100 Participants CPO/CO Employee Class Members								
	Male and Female - Years of ERS Decrement Service							
Age	0	1	2	3	4	5	10	15
20	23	19	17	17				
25	20	17	14	14	14	13		
30	16	13	12	11	10	10	8	
35	16	11	9	9	8	7	6	4
40	14	10	8	7	7	7	5	2
45	13	10	7	6	6	6	3	2
50	12	9	7	6	6	6	3	2
55	12	7	5	5	4	4		
60	13	7	5	5				

Active CPO/CO Employee Class Members – hired on or after September 1, 2009

Annual Rates of Termination per 100 Participants CPO/CO Employee Class Members								
	Male and Female - Years of ERS Decrement Service							
Age	0	1	2	3	4	5	10	15
20	24	20	17	17				
25	22	19	16	16	16	15		
30	17	15	14	12	12	12	8	
35	18	12	11	11	10	8	6	4
40	15	11	9	8	8	8	5	2
45	14	11	8	7	7	7	3	2
50	13	11	8	7	7	6	3	2
55	13	8	5	5	4	4		
60	15	8	5	5				

Rates of Withdrawal of Employee Contributions

Every member that terminates employment and does not have a benefit payable from this plan is assumed to withdraw their employee contributions.

Percentage of Members Electing Various Benefit Options:

Sex/ Benefit	Standard Life Annuity	Option 1	Option 4
Male Member			
Disability	50%	40%	10%
Service Retirement	100%	0%	0%
Death Benefit Plan	0%	75%	25%
Female Member			
Disability	75%	20%	5%
Service Retirement	100%	0%	0%
Death Benefit Plan	0%	50%	50%

Beneficiary Characteristics: Male member is assumed to be three years older than female beneficiary; and female member is assumed to be the same age as male beneficiary.

Census Data and Assets

- The valuation was based on members of LECOSRF as of August 31, 2016 and does not take into account future members.
- All census data was supplied by ERS and was subject to reasonable consistency checks.
- There were data elements that were modified for some members as part of the valuation in order to make the data complete. However, the number of missing data items was immaterial.
- Asset data was supplied by ERS.

Other Actuarial Valuation Procedures

- No provision was made in this actuarial valuation for the limitations of Internal Revenue Code Sections 415 or 401(a)(17).
- Valuation payroll (earnings applied to the current valuation year) is the expected payroll for the fiscal year following the valuation date. It is based on reported payroll determined from August member contributions increased to reflect the across-the-board salary increases appropriated by the State legislature, effective on or after September 1, and projected according to the actuarial assumptions for the upcoming fiscal year.
- No liability was included for benefits which are funded by special State appropriations.
- State appropriations for membership fees have been ignored.

DETAILED SUMMARIES OF MEMBERSHIP DATA

TABLE NUMBER	PAGE	
A	36	SUMMARY OF MEMBERSHIP DATA
B	37	ACTIVE MEMBERS: DISTRIBUTION BY AGE AND SERVICE
C	38	RETIRED AND BENEFICIARY MEMBERS: DISTRIBUTION BY AGE AND CATEGORY

TABLE A

SUMMARY OF MEMBERSHIP DATA

Active Members

Item	Male	Female	Total
Number of Members	24,303	14,763	39,066
Average Annual Salaries	$ 47,155	$ 40,485	$ 44,634
Average Age	40.9	41.3	41.0
Average Service	8.2	7.5	8.0

Annuitants

Item	Number	Annual Annuities	Average Annuities	Average Age
Service Retirees and Beneficiaries	11,413	$ 60,122,640	5,268	62.8
Disability Retirees	102	$ 958,224	9,394	67.6
Total	11,515	$ 61,080,864	$ 5,304	62.8

Inactive Members Assumed Eligible for Deferred Annuities

Item	Number	Annual Annuities	Average Annuities	Average Age
Participants with Deferred Benefits	95	$ 671,388	$ 7,067	48.8

Non-vested Inactive Members

Item	Number	Account Balances	Average Account Balances	Average Age
Non-vested Members	15,108	$ 3,559,523	$ 236	35.5

TABLE B

ACTIVE MEMBERS
DISTRIBUTION BY AGE AND SERVICE

	Years of Service									
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40+**	**Total**
Under 25	4,139	23								4,162
	$ 33,995	$ 41,139								$ 34,035
25 - 29	4,007	783	14							4,804
	$ 38,283	$ 44,602	$ 42,672							$ 39,325
30 - 34	2,741	1,455	517	31						4,744
	$ 38,577	$ 51,101	$ 49,149	$ 53,146						$ 43,666
35 - 39	2,075	1,097	913	512	19					4,616
	$ 37,964	$ 49,025	$ 58,140	$ 54,668	$ 57,377					$ 46,516
40 - 44	1,723	942	852	961	664	20				5,162
	$ 37,911	$ 46,463	$ 53,944	$ 58,702	$ 58,407	$ 66,150				$ 48,734
45 - 49	1,435	934	760	933	1,232	469	13			5,776
	$ 38,094	$ 44,986	$ 50,410	$ 54,049	$ 58,840	$ 65,136	$ 78,696			$ 50,118
50 - 54	1,215	894	654	727	452	280	96	2		4,320
	$ 37,829	$ 43,618	$ 46,273	$ 48,855	$ 57,440	$ 73,769	$ 91,478	$ 98,944		$ 47,763
55 - 59	857	754	527	497	290	84	58	7		3,074
	$ 37,586	$ 43,484	$ 45,427	$ 46,804	$ 52,738	$ 71,846	$ 94,612	$ 94,580		$ 45,439
60 - 64	440	520	262	302	133	28	12	2		1,699
	$ 37,711	$ 42,937	$ 44,808	$ 46,716	$ 50,776	$ 57,369	$ 87,454	$ 96,483		$ 43,773
Over 64	179	280	110	85	38	14	2	1		709
	$ 37,422	$ 41,485	$ 43,036	$ 44,880	$ 48,781	$ 66,170	$ 56,699	$ 51,642		$ 42,043
Total	18,811	7,682	4,609	4,048	2,828	895	181	12		39,066
	$ 37,216	$ 46,279	$ 50,778	$ 52,663	$ 57,364	$ 68,262	$ 90,913	$ 92,047		$ 44,634

TABLE C

RETIRED AND BENEFICIARY MEMBERS DISTRIBUTION BY AGE AND CATEGORY

Age Last Birthday	Number	Annual Benefit	Average Annual Benefit
Service Retirees			
Under 60	4,789	26,663,244	5,568
60 - 64	2,349	11,937,708	5,082
65 - 69	1,874	9,572,340	5,108
70 - 74	920	4,686,588	5,094
75 - 79	461	2,533,080	5,495
Over 79	355	2,124,756	5,985
Total	10,748	57,517,716	5,351
Beneficiaries			
Under 60	93	385,128	4,141
60 - 64	84	328,548	3,911
65 - 69	102	355,548	3,486
70 - 74	84	307,008	3,655
75 - 79	112	468,636	4,184
Over 79	190	760,056	4,000
Total	665	2,604,924	3,917
Disabled Retirees			
Under 60	29	237,528	8,191
60 - 64	11	70,008	6,364
65 - 69	19	206,796	10,884
70 - 74	18	181,908	10,106
75 - 79	7	56,364	8,052
Over 79	18	205,620	11,423
Total	102	958,224	9,394
Grand Total	11,515	61,080,864	5,304

GLOSSARY

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ARC.

Actuarial Gain or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.),
b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB.

Actuarial Value of Assets or ***Valuation Assets:*** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ARC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: That portion of the pension plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Actuarially Determined Contribution (ADC) or ***Annual Required Contribution (ARC):*** A calculated contribution for a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Closed Amortization Period: A specific number of years that is counted down by one each year and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: An employer-sponsored retirement benefit that provides workers, upon attainment of designated age and service thresholds, with a monthly benefit based on the employee's salary and length of service. The value of a benefit from a defined benefit plan is generally not affected by the return on the assets that are invested to fund the benefit.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Funding Period or ***Amortization Period:*** The term "Funding Period" is used it two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ARC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

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

GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

JUDICIAL RETIREMENT SYSTEM OF TEXAS, PLAN 2

ANNUAL ACTUARIAL VALUATION – FUNDING

AS OF AUGUST 31, 2016

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November 17, 2016

Board of Trustees
Employees Retirement System of Texas
200 East 18th Street
Austin, TX 78701

Re: Actuarial Valuation for Funding Purposes as of August 31, 2016

Members of the Board:

We certify that the information contained in this report is accurate and fairly presents the actuarial position of the Judicial Retirement System of Texas, Plan 2 (JRS-2) as of August 31, 2016. This report was prepared at the request of the Board and is intended for use by ERS staff and those designated or approved by the Board. This report may be provided to parties other than ERS only in its entirety and only with the permission of the Board.

Actuarial Valuation

The primary purposes of the actuarial valuation report are to determine the adequacy of the current State contribution rate, describe the current financial condition of JRS-2, analyze changes in the condition of JRS-2, and provide various summaries of the data.

Plan Provisions

Our actuarial valuation as of August 31, 2016 reflects the benefit and contribution provisions set forth in Chapters 836 through 840 of the Texas Government Code. The current plan provisions are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. Additionally, the actuarial valuation incorporates all known across-the-board pay increases budgeted by the State Legislature for the current biennium. The current actuarial assumptions and methods are outlined in Appendix II of this report.

Data

The valuation was based upon information as of August 31, 2016, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not

otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of, where applicable, the Internal Revenue Code and ERISA.

The signing actuaries are independent of the plan sponsor. They are all Enrolled Actuaries, Fellows of the Society of Actuaries, and Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, each of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

R. Ryan Falls, FSA, EA, MAAA
Senior Consultant

Joseph P. Newton, FSA, EA, MAAA
Senior Consultant

Dana Woolfrey, FSA, EA, MAAA
Consultant

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SECTION A

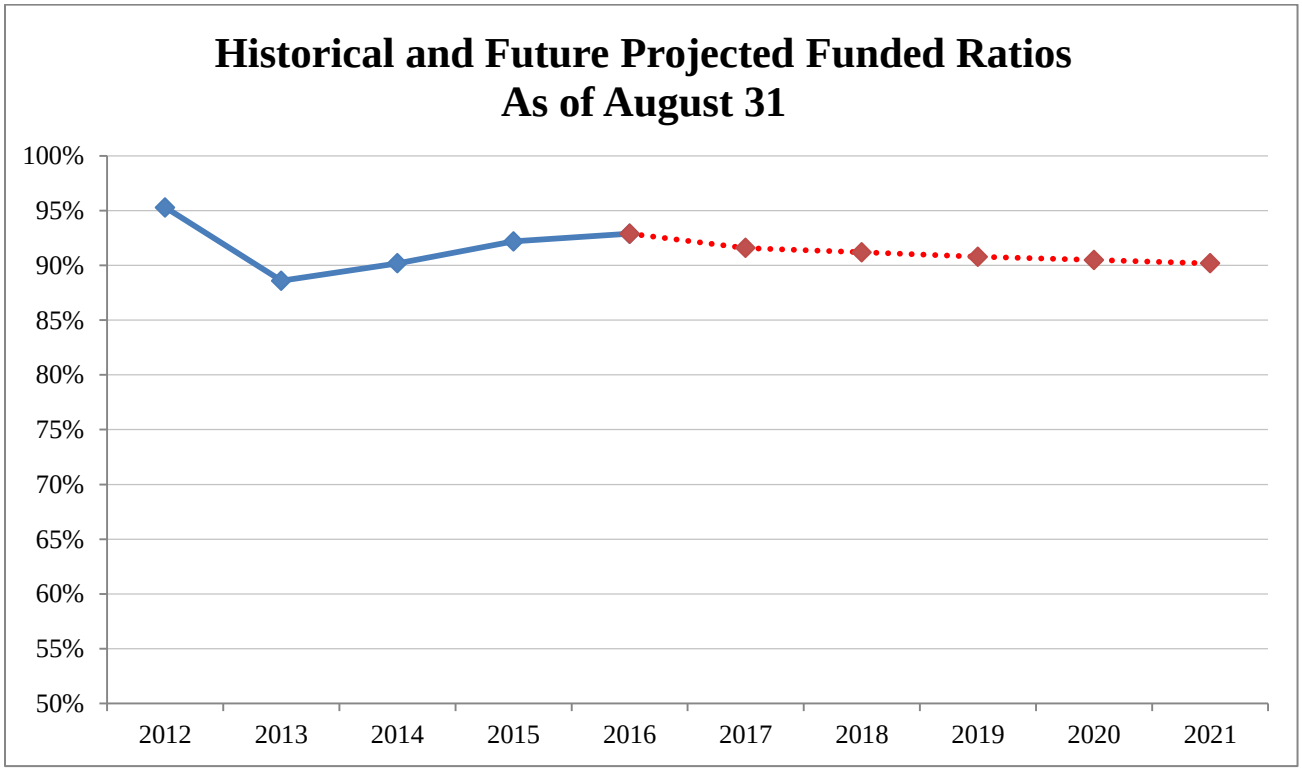
EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Item	2016	2015
Membership		
• Number of		
- Active members	548	563
- Retirees and beneficiaries	331	322
- Inactive, vested	16	14
- Inactive, nonvested	150	134
- Total	1,045	1,033
• Valuation Payroll	$ 78,238,000	$ 80,352,000
Statutory contribution rates	FY 2017	FY 2016
• Members	7.44%	7.16%
• State	15.663%	15.663%
Actuarially Sound Rate (funds normal cost and amortizes unfunded accrued liability over 31 years, per Section 840.106 of the Texas Government Code)	23.48%	23.79%
Assets		
• Market value (MVA)	$ 381,119,508	$ 364,510,248
• Actuarial value (AVA)	$ 395,457,335	$ 372,615,005
• Return on market value*	5.3%	0.5%
• Return on actuarial value	7.0%	7.4%
Actuarial Information on AVA (smoothed)		
• Normal cost %	21.18%	21.40%
• Total normal cost	$ 16,570,808	$ 17,195,328
• Actuarial accrued liability	$ 425,865,307	$ 404,010,572
• Unfunded actuarial accrued liability (UAAL)	$ 30,407,972	$ 31,395,567
• Funded ratio	92.9%	92.2%
• Funding period (years)	49	Never
Actuarial Information on MVA		
• Unfunded actuarial accrued liability (UAAL)	$ 44,745,799	$ 39,500,324
• Funded ratio	89.5%	90.2%

* Provided by ERS Master Trust Custodian

The following chart illustrates the recent history and outlook of the funded status of JRS-2 over the next five years:



August 31,	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Funded Ratio	95.3%	88.6%	90.2%	92.2%	92.9%	91.6%	91.2%	90.8%	90.5%	90.2%
UAAL (in millions)	$14.8	$41.0	$37.9	$31.4	$30.4	$37.4	$41.3	$45.0	$48.7	$52.3
ASC	21.52%	24.08%	23.86%	23.79%	23.48%	23.77%	23.84%	23.90%	23.97%	24.00%

The projections beyond 2016 are based on the same assumptions, methods and provisions used for the August 31, 2016 valuation, which include known across-the-board pay increases budgeted by the State Legislature and the assumptions adopted by the Board in February 2013. Additionally, the market value of assets is expected to earn 8% per year.

Assuming the market value of assets earns 8% per year, JRS-2 is projected to become insolvent in approximately 90 years. However, assuming the actuarial (smoothed) value of assets earns 8% per year, JRS-2 is projected to reach full funding in 2065. This discrepancy is primarily due to the $14.3 million in deferred assets losses yet to be recognized in the actuarial value of assets. It is important for the Board of Trustees to understand that the vast majority of the total contribution for JRS-2 goes towards the normal cost for current members and only a small portion of the total contribution goes towards eliminating the UAAL. As a result, small deviations from both demographic and economic assumptions can have a notable impact on the projected solvency of JRS-2.

SECTION B

DISCUSSION

DISCUSSION

Introduction

The results of the August 31, 2016 actuarial valuation of the Judicial Retirement System of Texas, Plan 2 (JRS-2) are presented in this report.

The primary purposes of this actuarial valuation report are to determine the adequacy of the current State contribution rate, describe the current financial condition of JRS-2, analyze the changes in the condition of JRS-2, and provide various summaries of the data.

The total contribution rate for the current fiscal year exceeds the normal cost by 1.923% of payroll, which, on an actuarial value of assets basis, is sufficient to amortize the unfunded actuarial accrued liability (UAAL) over 49 years. However, on a market value of assets basis, the total contribution rate is not sufficient to amortize the UAAL over a finite basis.

All of the tables referenced in the following discussion appear in Section C of this report.

Plan Provisions

There were no changes to the plan provisions during the past year. The current plan provisions are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. We did not perform an independent analysis of the actuarial assumptions. We believe the assumptions are internally consistent and are reasonable, based on the actual experience of JRS-2.

The actuarial valuation as of August 31, 2016 incorporates all known across-the-board pay increases budgeted by the State Legislature for the current biennium. Specifically, judges are not scheduled to receive an increase on September 1, 2015 nor on September 1, 2016.

The results of the actuarial valuations are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. A review of the impact of a different set of assumptions on the funded status of JRS-2 is outside the scope of this actuarial valuation.
The current actuarial assumptions are outlined in Appendix II of this report.

Funding Adequacy

The funding objective of JRS-2 is to fund the sum of the normal cost and the amount necessary to amortize any unfunded actuarial accrued liability over a period that does not exceed 30 years by one or more years. Contribution rates should be established which, over time, will remain level as a percent of payroll.

The member contribution rates are established by State statute and the State contribution rate is set by State statute and legislative appropriation. For the fiscal year beginning September 1, 2016, members accruing benefits contribute 7.50% of payroll and the State contributes 15.663% of payroll. Since some active JRS-2 members have elected to cease contributing to the plan as well as cease accruing additional benefits, the effective member contribution rate for the fiscal year beginning September 1, 2016 is 7.44% of payroll. This rate is subject to future legislative appropriations.

The unfunded actuarial accrued liability (UAAL) of JRS-2 decreased from $31.4 million as of August 31, 2015 to $30.4 million as of August 31, 2016. Additionally, the funded ratio of JRS-2 increased from 92.2% to 92.9% as of August 31, 2016. The funded status is one of many metrics used to show trends and develop future expectations about the health of a retirement system. The funded status measure itself is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions since it does not reflect normal cost contributions, the timing of amortization payments, or future experience other than expected.

The valuation shows that the total normal cost for funding purposes is 21.18% of payroll. The total contribution rate is 23.103% of payroll for the current fiscal year. The total contribution rate for the current fiscal year exceeds the normal cost by 1.923% of payroll, which is sufficient to amortize the UAAL over 49 years on an actuarial value of assets basis. As a result, the current contribution rates are expected to eliminate the UAAL for JRS2 in 49 years based on the current benefit provisions and actuarial assumptions. However, it is important to note that assuming the market value of assets earns 8% per year, JRS-2 is projected to become insolvent in approximately 90 years.

Section 840.106 of the Texas Government Code limits the modifications to JRS-2 that would, essentially, increase benefits or lower contributions to the trust unless the current level of benefits and contributions are considered actuarially sound. Section 840.106 defines actuarially sound as a retirement system that is receiving a total contribution rate sufficient to cover the normal cost, administrative expenses, and amortize the UAAL over a period of 31 years, or less. Based on the actuarial valuation as of August 31, 2016, the actuarially sound contribution (ASC) rate for JRS-2 is 23.48% of payroll.

As noted, the ASC is currently calculated based on a 31-year open amortization period. This means that the ASC contribution will always be calculated with the same 31-year period and the UAAL would never completely disappear. Even though the contributions to JRS-2 are not based on this ASC, the Board may want to consider adopting a funding policy that includes an ultimate goal of

eliminating the UAAL by a certain date. This type of funding policy will allow the Board to better assess the level of contributions received from the employers and the State.

System Assets

This report contains several tables that summarize key information with respect to the JRS-2 assets.

The total market value of assets increased from $364.5 million to $381.1 million as of August 31, 2016. Table 5 reconciles the changes in the fund during the year. Total contributions increased slightly from $17.9 million to $18.1 million, due primarily to the scheduled increase in the member contribution rate from 6.90% to 7.20% (effectively, 6.87% to 7.16% for JRS-2 due to members that elected to cease contributing). Contributions for fiscal year 2016 are expected to increase again primarily due to further scheduled increases in the member contribution rate to 7.50% (effectively, 7.44% due to members that elected to cease contributing).

Table 6 shows the development of the actuarial value of assets. Rather than use the JRS-2 market value of assets, the valuation reflects a smoothed asset value. This actuarial value is calculated by immediately reflecting 20% of the difference between the expected actuarial value and the current market value. The actuarial value is currently 3.8% more than the market value.

The approximate investment return for the fiscal year ending August 31, 2016 was 5.3% when measured on market value and 7.0% when measured on actuarial value. Table 7 shows a history of return rates for the past ten years. The JRS-2 ten-year average market return, net of investment expenses as reported by the ERS Master Trust Custodian, is 5.8%.

Table 8 provides a history of the contributions paid into JRS-2 and the administrative expenses and benefit payments that have been paid out of JRS-2. This table shows that administrative expenses and benefits paid exceeded contributions received by $1.6 million (or 0.4% of assets) in fiscal year 2015 and that amount was $3.3 million (or 0.9% of assets) in fiscal year 2016. ERS should monitor this deficit as it could impact the future liquidity needs of JRS-2.

Data

The valuation was based upon information as of August 31, 2016, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

The tables in Appendix III show key census statistics for the various groups included in the valuation.

SECTION C

TABLES

Development of Employer Cost

	August 31, 2016	August 31, 2015
1. Payroll		
a. Reported Payroll (August Payroll of Active Members)	$ 78,238,000	$ 80,352,000
b. Valuation Payroll (Expected Covered Payroll for Following Plan Year)	78,238,000	80,352,000
2. Total Normal Cost Rate		
a. Gross normal cost rate	20.68%	20.90%
b. Administrative expenses	0.50%	0.50%
c. Total (Item 2a + Item 2b)	21.18%	21.40%
3. Actuarial Accrued Liability for Active Members		
a. Present value of future benefits for active members	$ 300,182,639	$ 286,075,055
b. Less: present value of future normal costs	(82,520,893)	(87,218,042)
c. Actuarial accrued liability	$ 217,661,746	$ 198,857,013
4. Total Actuarial Accrued Liability for:		
a. Retirees and beneficiaries	$ 196,779,287	$ 194,524,402
b. Inactive members	11,424,274	10,629,157
c. Active members (Item 3c)	217,661,746	198,857,013
d. Total	$ 425,865,307	$ 404,010,572
5. Actuarial Value of Assets	$ 395,457,335	$ 372,615,005
6. Unfunded Actuarial Accrued Liability (UAAL) (Item 4d - Item 5)	$ 30,407,972	$ 31,395,567
7. Amortization of UAAL Over 31 Years as a Level Percentage of Payroll	2.30%	2.39%
8. Contribution Rate Needed to Fund Normal Cost Plus Amortize the UAAL Over 31 Years (Item 2c + Item 7)	23.48%	23.79%
9. Allocation of Contribution Rate		
a. Employer rate	15.663%	15.663%
b. Member rate	7.44%	7.16%
c. Total contribution rate	23.103%	22.823%
d. Total normal cost rate	21.18%	21.40%
e. Available contribution rate to amortize UAAL	1.923%	1.423%
f. Total contribution rate	23.103%	22.823%
10. Funding period based on statutory contribution rates and Actuarial Value of Assets (years)	49	Never

Actuarial Present Value of Future Benefits

		August 31, 2016	August 31, 2015
1.	Active Members		
	a. Service Retirement	$ 273,908,650	$ 259,495,191
	b. Disability Benefits	3,610,321	3,705,899
	c. Death Before Retirement	10,766,912	10,607,029
	d. Termination	11,896,756	12,266,936
	e. Total	$ 300,182,639	$ 286,075,055
2.	Inactive Members	$ 11,424,274	$ 10,629,157
3.	Annuitants	$ 196,779,287	$ 194,524,402
4.	Total Actuarial Present Value of Future Benefits	$ 508,386,200	$ 491,228,614

Analysis of Normal Cost

	August 31, 2016	August 31, 2015
1. Gross Normal Cost Rate		
a. Service Retirement	17.28%	17.44%
b. Disability Benefits	0.55%	0.55%
c. Death Before Retirement	0.77%	0.82%
d. Termination	2.08%	2.09%
e. Total	20.68%	20.90%
2. Administrative Expenses	0.50%	0.50%
3. Total Normal Cost	21.18%	21.40%
4. Less: Member Rate	7.44%	7.16%
5. Employer Normal Cost Rate	13.74%	14.24%

Historical Summary of Active Member Data

	Active Members		Covered Payroll		Average Salary			
Valuation as of August 31,	Number	Percent Increase	Annual Payroll ($)	Percent Increase	$ Amount	Percent Increase	Average Age	Average Service
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2008	518	0.6%	66,110,000	2.3%	127,625	1.7%	54.9	9.4
2009	533	2.9%	67,967,500	2.8%	127,519	-0.1%	55.2	9.0
2010	539	1.1%	68,755,000	1.2%	127,560	0.0%	55.8	9.5
2011	546	1.3%	69,655,000	1.3%	127,573	0.0%	55.7	9.2
2012	541	-0.9%	68,777,500	-1.3%	127,130	-0.3%	56.5	10.0
2013	545	0.7%	69,515,000	1.1%	127,550	0.3%	56.5	9.6
2014	554	1.7%	79,122,500	13.8%	142,820	12.0%	57.3	10.2
2015	563	1.6%	80,352,000	1.6%	142,721	-0.1%	56.9	9.3
2016	548	-2.7%	78,238,000	-2.6%	142,770	0.0%	57.4	10.1

Reconciliation of Plan Net Assets

	Year Ending August 31, 2016 (1)	Year Ending August 31, 2015 (2)
1. Market value of assets at beginning of year	$ 364,510,248	$ 365,290,077
2. Revenue for the year		
a. Contributions for the year		
i. State (including membership fees)	$ 12,374,200	$ 12,457,095
ii. Member (including penalty interest)	5,754,349	5,464,997
iii. Total	$ 18,128,549	$ 17,922,092
b. Net investment income	$ 19,861,581	$ 820,005
c. Total revenue	$ 37,990,130	$ 18,742,097
3. Disbursements for the year		
a. Benefit payments and refunds	21,154,764	$ 19,238,317
b. Administrative expenses	226,106	283,609
c. Total expenditures	21,380,870	19,521,926
4. Increase in net assets (Item 2c - Item 3c)	$ 16,609,260	$ (779,829)
5. Market value of assets at end of year (Item 1 + Item 4)	$ 381,119,508	$ 364,510,248

Development of Actuarial Value of Assets

		Year Ending August 31, 2016
1. Actuarial value of assets at beginning of year	$	372,615,005
2. Net new investments		
a. Contributions for the year (Table 5)	$	18,128,549
b. Disbursements for the year (Table 5)		(21,380,870)
c. Subtotal		(3,252,321)
3. Assumed investment return rate		8.00%
4. Expected return	$	29,679,108
5. Expected actuarial value of assets at end of year (Item 1 + Item 2c + Item 4)	$	399,041,792
6. Market value of assets at end of year	$	381,119,508
7. Excess earnings/(shortfall) (Item 6 - Item 5)	$	(17,922,284)
8. Excess earnings/(shortfall) recognized (20% x Item 7)	$	(3,584,457)
9. Actuarial value of assets (Item 5 + Item 8)	$	395,457,335
10. Estimated rate of return		7.0%
11. Actuarial value as percentage of market value		103.8%

History of Investment Return Rates

Year Ending August 31 of	Market*	Actuarial
(1)	(2)	(3)
2003	9.2%	5.2%
2004	11.7%	6.2%
2005	12.7%	7.5%
2006	8.8%	7.7%
2007	13.9%	8.8%
2008	-4.6%	5.9%
2009	-6.6%	3.5%
2010	6.7%	4.1%
2011	12.6%	5.7%
2012	8.2%	7.6%
2013	10.1%	8.0%
2014	14.7%	9.3%
2015	0.5%	7.4%
2016	5.3%	7.0%
Average Returns		
Last Five Years:	7.7%	7.9%
Last Ten Years:	5.8%	6.7%

* Market Value Rates of Return provided by the ERS Master Trust Custodian.

History of Cash Flow

Year Ending August 31,	Contributions	Distributions and Expenditures: Benefit Payments and Refunds	Distributions and Expenditures: Administrative Expenses	Distributions and Expenditures: Total	External Cash Flow for the Year	Market Value of Assets	External Cash Flow as Percent of Market Value
(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)
2007	15,034	(5,805)	(395)	(6,200)	8,834	217,665	4.1%
2008	15,102	(6,717)	(244)	(6,962)	8,141	215,041	3.8%
2009	15,579	(8,229)	(240)	(8,469)	7,110	205,730	3.5%
2010	15,632	(9,407)	(277)	(9,684)	5,948	225,265	2.6%
2011	16,224	(11,768)	(286)	(12,054)	4,170	259,624	1.6%
2012	8,321	(12,982)	(230)	(13,212)	(4,891)	295,913	-1.7%
2013	8,817	(14,869)	(228)	(15,098)	(6,281)	318,385	-2.0%
2014	17,406	(16,420)	(267)	(16,687)	719	365,290	0.2%
2015	17,922	(19,238)	(284)	(19,522)	(1,600)	364,510	-0.4%
2016	18,129	(21,155)	(226)	(21,381)	(3,252)	381,120	-0.9%

Dollar amounts in thousands

Column (7) = Column (2) + Column (6).

Total Experience Gain or Loss

Item		Year Ending August 31, 2016	Year Ending August 31, 2015
(1)		(2)	(3)
A. Calculation of total actuarial gain or loss			
1. Unfunded actuarial accrued liability (UAAL), previous year		$ 31,395,567	$ 37,855,797
2. Normal cost for the year (excluding administrative expenses)		16,793,568	16,243,849
3. Actual Administrative expenses		226,106	283,609
4. Contributions for the year (excluding service purchases)		(18,113,430)	(17,820,849)
5. Interest at 8%			
a. On UAAL		$ 2,511,645	$ 3,028,464
b. On normal cost		680,787	661,098
c. On contributions		(724,537)	(712,834)
d. Total		$ 2,467,895	$ 2,976,728
6. Assumption Change (Gains)/Losses		$ 0	$ 0
7. Legislative Changes		0	(13,986,651)
8. Expected UAAL (Sum of Items 1 through 7)		32,769,706	25,552,483
9. Actual UAAL		30,407,972	31,395,567
10. Total (gain)/loss for the year (Item 9 - Item 8)		$ (2,361,734)	$ 5,843,084
B. Source of gains and losses	% of AAL		
11. Asset (gain)/loss for the year	0.84%	$ 3,584,457	$ 2,026,189
12. Pay Increases (Less)/Greater than Expected	0.00%	0	243,339
13. Non-Retired Demographic (Gains)/Losses	1.83%	(7,807,497)	5,576,829
14. Post-Retirement Mortality (Gains)/Losses	0.21%	885,212	(6,558)
15. Other Demographic (Gains)/Losses	0.23%	976,094	(1,996,715)
16. Total (Sum of Items 11 through 15)	0.55%	$ (2,361,734)	$ 5,843,084

Solvency Test

Actuarial Accrued Liability and Percent of Active Member Payroll for:

	Accumulated Member Contributions Including Interest		Retirees and Beneficiaries Currently Receiving Benefits		Employer Financed Portion of Vested and Nonvested Benefits			Portion of Accrued Liabilities Covered by Assets		
August 31,	(1)	% of Payroll	(2)	% of Payroll	(3)	% of Payroll	Actuarial Value of Assets	(1)	(2)	(3)
2007	$ 44,615	69%	$ 62,008	96%	$ 114,261	177%	$ 211,933	100%	100%	92%
2008	50,408	76%	63,792	96%	124,898	189%	232,891	100%	100%	95%
2009	51,733	76%	85,845	126%	117,991	174%	248,279	100%	100%	94%
2010	57,347	83%	92,253	134%	132,160	192%	264,515	100%	100%	87%
2011	57,769	83%	120,798	173%	121,596	175%	283,935	100%	100%	87%
2012	63,678	93%	122,571	178%	128,950	187%	300,433	100%	100%	89%
2013	64,435	93%	147,052	212%	147,571	212%	318,026	100%	100%	72%
2014	69,364	88%	153,383	194%	163,539	207%	348,431	100%	100%	77%
2015	67,428	84%	194,524	242%	142,059	177%	372,615	100%	100%	78%
2016	73,450	94%	196,779	252%	155,636	199%	395,457	100%	100%	80%

Note : Dollar amounts in thousands

APPENDICES

SUMMARY OF PLAN PROVISIONS FOR JUDICIAL RETIREMENT SYSTEM, PLAN 2

Membership

Membership is mandatory at the first day of employment for eligible persons who, after August 31, 1985, became a judge, justice, or commissioner of:

(1) The Supreme Court;
(2) The Court of Criminal Appeals;
(3) Courts of Appeals;
(4) District Courts; or
(5) Specified commissioners to a court.

Member Contributions

Judicial officers contribute a percentage of their compensation based on the following schedule:

a. Fiscal year 2014: 6.60%
b. Fiscal year 2015: 6.90%
c. Fiscal year 2016: 7.20%
d. Fiscal year 2017 and beyond: 7.50%

Beginning in fiscal year 2018, the 7.50% will be reduced one-tenth of one percent for each one-tenth of one percent that the State contribution rate for the fiscal year to which the service relates is less than the State contribution rate established for the 2015 fiscal year.

Contributions cease after member has accrued 20 years of service credit or has served 12 years on an appellate court and attained the Rule of 70. However, these members may elect to make contributions for each subsequent year of service credit and receive the additional benefit accruals.

Member contributions accumulate interest at 5.00% per year through December 31, 2013 and 2.00% interest per year, thereafter.

State of Texas Contributions

State contributions are set biennially by the legislature. For fiscal years 2016 and 2017, the State will contribute 15.663% of payroll.

Final Compensation

The State salary being paid at the time the member retires to a judge of a court of the same classification as the last court to which the member was elected or appointed.

Creditable Service

The types of service creditable in JRS-2 are membership service, military service and equivalent membership service. Equivalent membership service includes: previously cancelled service, service not previously established, waiting period service, and additional purchased service.

Standard Service Retirement Annuity

1. Eligibility:
   a. Age 65 and ten years of service if currently holding judicial office; or
   b. Age 65 and twelve years of service; or
   c. Twenty years of service, regardless of age; or
   d. Member's age plus service credited in the retirement system equals 70 (Rule of 70), if the member has served at least twelve years on an appellate court.
2. Benefits: Monthly annuity payable for life, equal to 50% of Final Compensation at retirement, increased by 10% of Final Compensation at retirement if the member has not been out of judicial office for one year or the member has served as a visiting judge within one year of benefit commencement.

   Members who elect to continue their contributions after 20 years of service credit, or after serving 12 years on an appellate court and attaining the Rule of 70, can earn up to a maximum total benefit of 90% of Final Compensation. For each such year, the service retirement annuity would be increased by 2.3% of the Final Compensation at retirement.
3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Early Commencement of the Standard Service Retirement Annuity

1. Eligibility:
   a. Age 60 and ten years of service if currently holding judicial office; or
   b. Age 60 and twelve years of service.
2. Benefits: Standard Service Retirement Annuity with the 50% replaced by the following percentages based on age at retirement:

Attained Age	Percent of Final Compensation
60	40.0%
61	41.7
62	43.6
63	45.6
64	47.7

3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Standard Non-Occupational Disability Annuity

1. Eligibility: Seven years of service and Chief Justice of the Supreme Court and the medical board must certify that the member is mentally or physically incapacitated for the further performance of regular judicial duties.
2. Benefits: Unreduced Standard Service Retirement Annuity.
3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Death Benefit Plan (DBP) Annuity

1. Eligibility: Death of an active member with 10 years of service.
2. Benefits: Benefits are calculated as if the member had elected an optional form of payment, received a Standard Service Retirement Annuity, and died immediately thereafter. If the member dies before becoming eligible for a Standard Service Retirement Annuity, the benefit is reduced for early retirement from age 65.

Pre-Retirement Death Refund Alternative

A refund of accumulated contributions is payable in cases of pre-retirement death where the member did not meet the eligibility requirements for a Death Benefit Plan Annuity, or the eligible beneficiary chooses to receive a refund of the member account balance in lieu of an annuity. This amount is increased by 5% of the member's account balance at death, times full years of service credit at death, to a maximum of 100%.

Deferred Service Retirement Annuity

1. Eligibility: Twelve or more years of service and Member Contributions have not been refunded.
2. Benefits: The Standard Service Retirement Annuity earned as of the date of termination; provided that the annuity may be increased under the provisions of the proportionate retirement program if the member becomes a contributing member of another system that participates in the program.
3. Payments may commence at: Age 65; or a reduced amount as early as age 60.
4. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Refund of Accumulated Contributions

A refund of accumulated contributions is payable in cases where a terminated member did not meet the eligibility requirements for an annuity, or a terminated member chooses to receive a refund of his or her account balance in lieu of an annuity.

Limit on Plan Modifications

According to Section 840.106 of the Texas Government Code – a rate of member or State contributions to or a rate of interest required for the establishment of credit in the retirement system may not be reduced or eliminated, a type of service may not be made creditable in the retirement system, a limit on the maximum permissible amount of a type of creditable service may not be removed or raised, a new monetary benefit payable by the retirement system may not be established, and the determination of the amount of a monetary benefit from the system may not be increased, if, as a result of the particular action, the time, as determined by an actuarial valuation, required to amortize the UAAL of the retirement system would be increased to a period that exceeds 30 years by one or more years.

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation that covered the five-year period from September 1, 2006 through August 31, 2011.

I. Valuation Date

The valuation date is August 31 of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

Because the employer contribution rate is set by statute, the actuarial valuation is used to determine the adequacy of the current State contribution rate and describe the current financial condition of JRS-2.

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the first step is to determine the contribution rate (level as a percentage of pay) required to provide the benefits to each member, or the normal cost rate. The normal cost rate consists of two pieces: (i) the member's contribution rate, and (ii) the remaining portion of the normal cost rate which is the employer's normal cost rate.

The Unfunded Actuarial Accrued Liability (UAAL) is the liability for future benefits which is in excess of (i) the actuarial value of assets, and (ii) the present value of future normal costs. The employer contribution provided in excess of the employer normal cost is applied to amortize the UAAL.

The funding period is calculated as the number of years required to fully amortize the UAAL, assuming that: (a) future market earnings, net of investment-related expenses, will equal 8.00% per year, (b) there will be no liability gains/losses or changes in assumptions, (c) the number of active members will remain unchanged, (d) active members who leave employment will be replaced by new entrants each year, and (e) State contributions will remain the same percentage of payroll as the current fiscal year.

The Entry Age actuarial cost method is an "immediate gain" method (i.e., experience gains and losses are separately identified as part of the UAAL). However, they are amortized over the same period applied to all other components of the UAAL.

III. *Actuarial Value of Assets*

The actuarial value of assets is determined as the expected value of plan assets as of the valuation date plus 20% of the difference between the market-related value and the expected value. The expected value equals the actuarial value of plan assets as of the prior valuation date, plus contributions, less benefit payments and administrative expenses, all accumulated at the assumed rate of interest to the current valuation date.

IV. *Actuarial Assumptions*

Investment Return: 8.00% per year, net of investment-related expenses (composed of an assumed 3.50% inflation rate and a 4.50% real rate of return)

Administrative Expenses: 0.50% of valuation payroll per year

Salary Increases: 3.50% per year; total liabilities for this valuation reflect all known legislative salary increases for the biennium.

Payroll Growth: 3.50% per year, compounded annually (for projecting valuation payroll).

Post-Retirement Benefit Increases: None

Age and Service Assumptions and Methods:

Rounding of ages:

Current and projected ages rounded to the nearest year are used for all purposes – determining eligibility for benefits, present value factors, early retirement reductions, option factors, salary increase rates, and decrements.

Benefit Service:

Current Benefit Service in years and months as of the valuation date was provided by ERS. This service plus Future Earned Service, and Eligibility Service at Retirement were used to project benefit amounts.

Future Earned Service:

Active members were assumed to earn one additional year of service credit in each future year they are assumed to make contributions.

Service for Decrements:

The method of calculating JRS Decrement Service on the valuation date is shown below. Decrement service is assumed to increase by one year for each future year employed.

- Valuation Age: Age rounded to the nearest year on valuation date
- JRS Service: Years and months of all JRS service on the valuation date
- Date 1: (Valuation Date) minus (JRS Service)
- JRS Decrement Service: (Valuation Age) minus (age rounded to nearest year on Date 1)
- JRS Funding Entry Age (age at hire for the entry age normal cost method): (Valuation Age) minus (JRS Decrement Service)

Decrement Timing: All decrements – mortality, service retirement, disability retirement, and termination of employment for reasons other than death or retirement – are assumed to occur at the beginning of the valuation year.

Mortality Decrements:

Active Members, Service Retirees, Beneficiaries, and Inactive Members

1994 Group Annuity Mortality with no setback for males and set forward two years for females. Generational mortality improvements in accordance with Scale AA are projected from the year 2000.

Disability Retirees

RP-2000 Disabled Retiree Mortality set forward six years for males and setback one year for females.

Service Retirement Decrements: Graded tables based on JRS-1 and JRS-2 experience.

JRS Decrement Service is used to determine when the rates apply:

- Age 65 with ten years of service, if member currently holding judicial office
- Age 65 with twelve years of service
- Twenty years of service
- Age plus service equal to or greater than 70, if member has at least twelve years of service on an appellate court

Annual Service Retirement Rates per 100 Participants	
Age	
50 - 69	20
70 - 74	25
75+	100

Members are assumed to retire when they are projected to have accrued the maximum benefit of 90% of applicable salary, regardless of whether the member elects to continue contributing.

Disability Retirement Decrements: Graded Tables Based on ERS Experience

JRS Decrement Service is used to determine when the rates apply:

- The rates do not apply before someone is eligible for the benefit.
- Service greater than zero is required for occupational disability retirement.
- Seven years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60.

Sample rates for eligible members:

Annual Disability Rates per 100 Participants		
Age	Males	Females
30	0.0366	0.0180
35	0.0867	0.0589
40	0.0999	0.1195
45	0.1369	0.1940
50	0.1979	0.2762
55	0.3302	0.4651

99% of the disability rates stated above are assumed to be attributable to non-occupational disabilities and 1% are assumed to be attributable to occupational disabilities. No occupational disabilities are assumed for judges.

Termination Decrements for Reasons Other Than Death or Retirement: Based on JRS-1 and JRS-2 Experience

Four per 100 participants for members not eligible for service retirement.

Rates of Withdrawal of Employee Contributions

Members eligible to receive a deferred annuity are assumed not to withdraw their contributions. Members not eligible to receive a deferred annuity are assumed to withdraw their contributions.

Percentage of Members Electing Various Benefit Options:

Sex/ Benefit	Standard Life Annuity	Option 1	Option 4
Male Member			
Disability	50%	40%	10%
Service Retirement	100%	0%	0%
Death Benefit Plan	0%	75%	25%
Female Member			
Disability	75%	20%	5%
Service Retirement	100%	0%	0%
Death Benefit Plan	0%	50%	50%

Beneficiary Characteristics: Male member is assumed to be three years older than female beneficiary; and female member is assumed to be the same age as male beneficiary.

Census Data and Assets

- The valuation was based on members of JRS-2 as of August 31, 2015 and does not take into account future members.
- All census data was supplied by ERS and was subject to reasonable consistency checks.
- There were data elements that were modified for some members as part of the valuation in order to make the data complete. However, the number of missing data items was immaterial.
- Asset data was supplied by ERS.

Other Actuarial Valuation Procedures

- No provision was made in this actuarial valuation for the limitations of Internal Revenue Code Sections 415 or 401(a)(17).
- Valuation payroll (earnings applied to the current valuation year) is the expected payroll for the fiscal year following the valuation date. It is based on reported payroll determined from August member contributions increased to reflect the across-the-board salary increases appropriated by the State legislature, effective on or after September 1, and projected according to the actuarial assumptions for the upcoming fiscal year.
- No liability was included for benefits which are funded by special State appropriations.

DETAILED SUMMARIES OF MEMBERSHIP DATA

TABLE NUMBER	PAGE	
A	31	SUMMARY OF MEMBERSHIP DATA
B	32	ACTIVE MEMBERS: DISTRIBUTION BY AGE AND SERVICE
C	33	RETIRED AND BENEFICIARY MEMBERS: DISTRIBUTION BY AGE AND CATEGORY

TABLE A

SUMMARY OF MEMBERSHIP DATA

Active Members

Item	Male	Female	Total
Number of Members	356	192	548
Average Annual Salaries	$ 142,402	$ 143,453	$ 142,770
Average Age	58.5	55.4	57.4
Average Service	10.2	10.0	10.1

Inactive Members

Item	Number	Annual Annuities	Average Annuities	Average Age
Participants with Deferred Benefits	16	$ 1,177,200	73,575	57.5
Service Retirees and Beneficiaries	329	$ 20,844,540	63,357	69.3
Disability Retirees	2	$ 159,000	79,500	64.2
Total	347	$ 22,180,740	$ 63,921	68.7

Non-vested Members

Item	Number	Account Balances	Average Account Balance	Average Age
Non-vested Particiapants	150	$ 4,936,491	$ 32,910	61.3

TABLE B

ACTIVE MEMBERS
DISTRIBUTION BY AGE AND SERVICE

Age	Years of Service									Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	
Under 25										
25 - 29										
30 - 34										
35 - 39	10	1								11
	$ 140,000	$ 140,000								$ 140,000
40 - 44	23	13								36
	$ 141,826	$ 142,154								$ 141,944
45 - 49	41	27	11							79
	$ 143,415	$ 140,519	$ 146,364							$ 142,835
50 - 54	26	39	12	15	2					94
	$ 142,692	$ 141,436	$ 143,500	$ 142,800	$ 140,000					$ 142,234
55 - 59	29	17	19	24	9					98
	$ 142,897	$ 140,824	$ 142,947	$ 145,250	$ 141,556					$ 143,000
60 - 64	15	37	20	21	18	6				117
	$ 141,867	$ 140,757	$ 142,925	$ 144,905	$ 148,833	$ 147,417				$ 143,598
Over 64	11	28	24	22	17	10	1			113
	$ 140,000	$ 141,000	$ 143,021	$ 144,568	$ 142,471	$ 145,600	$ 140,000			$ 142,646
Total	155	162	86	82	46	16	1			548
	$ 142,348	$ 141,037	$ 143,477	$ 144,530	$ 144,674	$ 146,281	$ 140,000			$ 142,770

TABLE C

RETIRED AND BENEFICIARY MEMBERSHIP DATA DISTRIBUTION BY AGE AND CATEGORY

Age Last Birthday	Number	Annual Benefit	Average Annual Benefit
Service Retirees			
Under 60	20	1,212,000	60,600
60 - 64	66	4,294,404	65,067
65 - 69	85	5,734,512	67,465
70 - 74	71	4,474,956	63,028
75 - 79	36	2,240,808	62,245
Over 79	16	912,720	57,045
Total	294	18,869,400	64,182
Beneficiaries			
Under 60	4	205,344	51,336
60 - 64	7	465,348	66,478
65 - 69	5	266,736	53,347
70 - 74	7	399,132	57,019
75 - 79	3	175,824	58,608
Over 79	9	462,756	51,417
Total	35	1,975,140	56,433
Disabled Retirees			
Under 60	0	0	0
60 - 64	1	75,000	75,000
65 - 69	1	84,000	84,000
70 - 74	0	0	0
75 - 79	0	0	0
Over 79	0	0	0
Total	2	159,000	79,500
Grand Total	331	21,003,540	63,455

GLOSSARY

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ARC.

Actuarial Gain or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.),
b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB.

Actuarial Value of Assets or ***Valuation Assets:*** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ARC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: That portion of the pension plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Actuarially Determined Contribution (ADC) or ***Annual Required Contribution (ARC):*** A calculated contribution for a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Closed Amortization Period: A specific number of years that is counted down by one each year and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: An employer-sponsored retirement benefit that provides workers, upon attainment of designated age and service thresholds, with a monthly benefit based on the employee's salary and length of service. The value of a benefit from a defined benefit plan is generally not affected by the return on the assets that are invested to fund the benefit.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Funding Period or ***Amortization Period:*** The term "Funding Period" is used it two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ARC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

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

GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

JUDICIAL RETIREMENT SYSTEM OF TEXAS, PLAN 1

ANNUAL ACTUARIAL VALUATION

AS OF AUGUST 31, 2016

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
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November 17, 2016

Board of Trustees
Employees Retirement System of Texas
200 East 18th Street
Austin, TX 78701

Re: Actuarial Valuation as of August 31, 2016

Members of the Board:

We certify that the information contained in this report is accurate and fairly presents the actuarial position of the Judicial Retirement System of Texas, Plan 1 (JRS-1) as of August 31, 2016. This report was prepared at the request of the Board and is intended for use by ERS staff and those designated or approved by the Board. This report may be provided to parties other than ERS only in its entirety and only with the permission of the Board.

Actuarial Valuation

JRS-1 is not advanced funded as the actual benefit payments are funded through legislative appropriations. As a result, the primary purpose for the annual actuarial valuation of JRS-1 is to determine the financial statement disclosure and reporting information as provided by the Governmental Accounting Standards Board. The applicable disclosure and reporting information for JRS-1 can be found in ERS' Comprehensive Annual Financial Report for the fiscal year ending August 31, 2016.

The purpose of this report is also to document the plan's Actuarial Accrued Liability and membership demographics as well as provide a projection of the appropriations needed to cover the actual plan benefit payments.

Plan Provisions

There were other changes to the plan provisions during the past year. The current plan provisions are outlined in Appendix I of this report.

Actuarial Assumptions and Methods

The assumptions and methods applied in these actuarial valuations were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation completed by Buck Consultants that covered the five-year period from September 1, 2006 through August 31, 2011. We did not perform an independent analysis of the actuarial assumptions. We believe the assumptions are internally consistent and are reasonable, based on the actual experience of JRS-1.

The actuarial valuation as of August 31, 2016 incorporates all known across-the-board pay increases budgeted by the State Legislature for the current biennium. Specifically, judges are not scheduled to receive an increase on September 1, 2016.

The interest rate used in this valuation reflects a composite expected rate of return based on all pension plans of the Employees Retirement System of Texas. As this pension plan has no assets, if an expected rate of return was separately determined for the JRS-1, the interest rate used would be significantly less than 8% per year.

The results of the actuarial valuations are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. A review of the impact of a different set of assumptions on the liabilities of JRS-1 is outside the scope of this actuarial valuation.

The current actuarial assumptions are outlined in Appendix II of this report.

Data

The valuation was based upon information as of August 31, 2016, furnished by ERS staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the information provided by ERS staff.

Appendix III shows key census statistics for the various groups included in the valuation.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of, where applicable, the Internal Revenue Code and ERISA.

The signing actuaries are independent of the plan sponsor. They are all Enrolled Actuaries, Fellows of the Society of Actuaries, and Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, each of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
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SUMMARY OF PLAN OBLIGATIONS

	August 31, 2016	August 30, 2015
1. Payroll		
a. Reported Payroll (August Payroll of Active Members)	$ 1,470,000	$ 1,470,000
b. Valuation Payroll (Expected Covered Payroll for Following Plan Year)	1,470,000	1,470,000
2. Total Normal Cost Rate		
a. Gross normal cost rate	26.35%	25.22%
b. Administrative expenses	0.00%	0.00%
c. Total (Item 2a + Item 2b)	26.35%	25.22%
3. Actuarial Accrued Liability for Active Members		
a. Present value of future benefits for active members	$ 11,130,751	$ 10,605,239
b. Less: present value of future normal costs	(297,307)	$ (361,109)
c. Actuarial accrued liability	$ 10,833,444	$ 10,244,130
4. Total Actuarial Accrued Liability for:		
a. Retirees and beneficiaries	$ 207,524,126	$ 212,882,207
b. Inactive members	112	44,319
c. Active members (Item 3c)	10,833,444	10,244,130
d. Total	$ 218,357,682	$ 223,170,656
5. Actuarial Value of Assets	$ 0	$ 0
6. Unfunded Actuarial Accrued Liability (UAAL) (Item 4d - Item 5)	$ 218,357,682	$ 223,170,656

SUMMARY OF PROJECTED PAYMENTS

The following chart illustrates the outlook of the benefit payments and contributions of JRS-1 over the next 10 years:

Fiscal Year	Projected Benefit Payments	Projected Member Contributions	Net Projected Appropriation
2017	$ 25,074,643	$ 20,855	$ 25,053,788
2018	24,720,741	16,362	24,704,379
2019	24,283,519	12,831	24,270,688
2020	23,671,262	9,702	23,661,560
2021	23,017,447	7,320	23,010,127
2022	22,330,313	5,511	22,324,802
2023	21,631,499	2,240	21,629,259
2024	20,890,846	1,683	20,889,163
2025	20,050,986	0	20,050,986
2026	19,267,271	0	19,267,271

The projections are based on the same assumptions, methods and provisions used for the August 31, 2016 valuation, which include known across-the-board pay increases budgeted by the State Legislature and the assumptions adopted by the Board in February 2013.

The projected benefit payments for JRS-1 are expected to slowly decline over time because the reduction in benefits due to the mortality of current retirees will exceed the expected benefit increases and the new benefits payable to current active members. Note that the projected benefit payments assume an across-the-board pay increase of 0% as of September 1, 2016, and 3.5% per year beginning September 1, 2017 in accordance with the valuation assumptions.

LIABILITY BASED ON MUNICIPAL BOND RATE

Since there are no assets held in trust to pay the benefits of JRS-1, another reasonable measure of the plan's obligation would be to calculate the liability based on an investment return assumption, or discount rate, that reflects the expected return on the assets that will be used to pay benefits. In this case, the assets that will be used to pay benefits are the general funds of the State of Texas.

As of August 31, 2016, the Actuarial Accrued Liability of JRS-1 is $328,044,409 based on a municipal bond rate of 2.84%.

The source of the municipal bond rate is the "20-Bond GO Index", which is the Bond Buyer Index, general obligation, 20 years to maturity, mixed quality. In describing this index, the Bond Buyer notes that the bonds' average credit quality is roughly equivalent to Moody's Investors Service's Aa2 rating and Standard & Poor's Corp.'s AA. The rate shown is as of the most recent date available on or before the measurement date.

SUMMARY OF PLAN PROVISIONS FOR JUDICIAL RETIREMENT SYSTEM, PLAN 1

Membership

Membership is mandatory at the first day of employment for eligible persons who, before August 31, 1985, became a judge, justice, or commissioner of:

(1) The Supreme Court;
(2) The Court of Criminal Appeals;
(3) Courts of Appeals;
(4) District Courts; or
(5) Specified commissioners to a court.

Member Contributions

Section 835.101 of the Texas Government Code requires members of JRS-1 to contribute the same amount as a member of the employee class of the Employees Retirement System of Texas. As a result, judicial officers contribute 9.50% of their compensation beginning in fiscal year 2016.

The ultimate member contribution rate may be subject to the State maintaining a certain level of contributions to the Employees Retirement System of Texas relative to the State's contribution for fiscal year 2017.

Contributions cease after member has accrued 20 years of service credit. However, these members may elect to make contributions for each subsequent year of service credit and receive the additional benefit accruals.

Member contributions accumulate interest at 5.00% per year through December 31, 2013 and 2.00% per year, thereafter.

State of Texas Contributions

Appropriations as needed to cover actual benefit payments.

Creditable Service

The types of service creditable in JRS-1 are membership service, military service and equivalent membership service. Equivalent membership service includes: previously cancelled service, service not previously established, waiting period service, and additional purchased service.

Standard Service Retirement Annuity

1. Eligibility:
   a. Age 65 and ten years of service if currently holding judicial office; or
   b. Age 65 and twelve years of service; or
   c. Twenty years of service, regardless of age; or
   d. Member's age plus service credited in the retirement system equals 70 (Rule of 70), if the member has served at least twelve years on an appellate court.
2. Benefits: Monthly annuity payable for life, equal to 50% of the State salary, as adjusted from time to time, being paid to a judge of a court of the same classification as the last court on which the member served before retirement. The 50% is increased to 60% if the member has not been out of judicial office for one year or the member has served as a visiting judge within one year of benefit commencement.

   Members who elect to continue their contributions after 20 years of service credit could do so for up to an additional 13 years of service. For each such year, the Standard Service Retirement Annuity would be increased by 2.3% of the applicable State salary.
3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Early Commencement of the Standard Service Retirement Annuity

1. Eligibility:
   a. Age 60 and ten years of service if currently holding judicial office; or
   b. Age 60 and twelve years of service.
2. Benefits: Standard Service Retirement Annuity with the 50% replaced by the following percentages based on age at retirement:

Attained Age	Percent of Applicable State Salary
60	40.0%
61	41.7
62	43.6
63	45.6
64	47.7

3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Standard Non-Occupational Disability Annuity

1. Eligibility: Seven years of service and Chief Justice of the Supreme Court and the medical board must certify that the member is mentally or physically incapacitated for the further performance of regular judicial duties.
2. Benefits: Unreduced Standard Service Retirement Annuity.
3. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Death Benefit Plan (DBP) Annuity

1. Eligibility: Death of an active member with 10 years of service.
2. Benefits: Benefits are calculated as if the member had elected an optional form of payment, received a Standard Service Retirement Annuity, and died immediately thereafter. If the member dies before becoming eligible for a Standard Service Retirement Annuity, the benefit is reduced for early retirement from age 65.

Pre-Retirement Death Refund Alternative

A refund of accumulated contributions is payable in cases of pre-retirement death where the member did not meet the eligibility requirements for a Death Benefit Plan Annuity, or the eligible beneficiary chooses to receive a refund of the member account balance in lieu of an annuity.

Deferred Service Retirement Annuity

1. Eligibility: Twelve or more years of service and Member Contributions have not been refunded.
2. Benefits: The Standard Service Retirement Annuity earned as of the date of termination; provided that the annuity may be increased under the provisions of the proportionate retirement program if the member becomes a contributing member of another system that participates in the program.
3. Payments may commence at: Age 65; or a reduced amount as early as age 60.
4. Normal Form of Payment: Payable for the life of the member with any remaining member account balance paid at time of death. Survivorship options and partial lump-sum option are available on an actuarially equivalent basis.

Refund of Accumulated Contributions

A refund of accumulated contributions is payable in cases where a terminated member did not meet the eligibility requirements for an annuity, or a terminated member chooses to receive a refund of his or her account balance in lieu of an annuity.

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on February 26, 2013 based on the experience investigation that covered the five-year period from September 1, 2006 through August 31, 2011.

I. Valuation Date

The valuation date is August 31 of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the first step is to determine the contribution rate (level as a percentage of pay) required to provide the benefits to each member, or the normal cost rate. The normal cost rate consists of two pieces: (i) the member's contribution rate, and (ii) the remaining portion of the normal cost rate which is the employer's normal cost rate.

The Unfunded Actuarial Accrued Liability (UAAL) is the liability for future benefits which is in excess of (i) the actuarial value of assets, and (ii) the present value of future normal costs. The employer contribution provided in excess of the employer normal cost is applied to amortize the UAAL.

The Entry Age actuarial cost method is an "immediate gain" method (i.e., experience gains and losses are separately identified as part of the UAAL). However, they are amortized over the same period applied to all other components of the UAAL.

III. Actuarial Value of Assets

JRS-1 is not an advance funded plan. No asset smoothing method is applicable.

IV. Actuarial Assumptions

Investment Return: 8.00% per year, net of investment-related expenses (composed of an assumed 3.50% inflation rate and a 4.50% real rate of return)

Administrative Expenses: None assumed.

Salary Increases: 3.50% per year; total liabilities for this valuation reflect all known legislative salary increases for the biennium.

Payroll Growth: Not applicable.

Post-Retirement Benefit Increases: Benefits are assumed to increase 3.50% per year during retirement (each September 1), compounded annually, consistent with the assumed Salary Increases for a judge of a court of the same classification as the last court on which the member served before retirement. Increases are assumed to also occur during deferral periods (if any).

Age and Service Assumptions and Methods:

Rounding of ages:

Current and projected ages rounded to the nearest year are used for all purposes – determining eligibility for benefits, present value factors, early retirement reductions, option factors, salary increase rates, and decrements.

Benefit Service:

Current Benefit Service in years and months as of the valuation date was provided by ERS. This service plus Future Earned Service, and Eligibility Service at Retirement were used to project benefit amounts.

Future Earned Service:

Active members were assumed to earn one additional year of service credit in each future year they are assumed to make contributions.

Service for Decrements:

The method of calculating JRS Decrement Service on the valuation date is shown below. Decrement service is assumed to increase by one year for each future year employed.

- Valuation Age: Age rounded to the nearest year on valuation date
- JRS Service: Years and months of all JRS service on the valuation date
- Date 1: (Valuation Date) minus (JRS Service)
- JRS Decrement Service: (Valuation Age) minus (age rounded to nearest year on Date 1)
- JRS Funding Entry Age (age at hire for the entry age normal cost method): (Valuation Age) minus (JRS Decrement Service)

Decrement Timing: All decrements – mortality, service retirement, disability retirement, and termination of employment for reasons other than death or retirement – are assumed to occur at the beginning of the valuation year.

Mortality Decrements:

Active Members, Service Retirees, Beneficiaries, and Inactive Members

1994 Group Annuity Mortality with no setback for males and set forward two years for females. Generational mortality improvements in accordance with Scale AA are projected from the year 2000.

Disability Retirees

RP-2000 Disabled Retiree Mortality set forward six years for males and setback one year for females.

Service Retirement Decrements: Graded tables based on JRS-1 and JRS-2 experience.

JRS Decrement Service is used to determine when the rates apply:

- Age 65 with ten years of service, if member currently holding judicial office
- Age 65 with twelve years of service
- Twenty years of service
- Age plus service equal to or greater than 70, if member has at least twelve years of service on an appellate court

Annual Service Retirement Rates per 100 Participants	
Age	
50 - 69	20
70 - 74	25
75+	100

Members are assumed to retire when they are projected to have accrued the maximum benefit of 90% of applicable salary, regardless of whether the member elects to continue contributing.

Disability Retirement Decrements: Graded Tables Based on ERS Experience

JRS Decrement Service is used to determine when the rates apply:

- The rates do not apply before someone is eligible for the benefit.
- Service greater than zero is required for occupational disability retirement.
- Seven years of service is required for non-occupational disability retirement.
- Non-occupational disability rates are assumed to be zero once the member has attained age 60.

Sample rates for eligible members:

Annual Disability Rates per 100 Participants		
Age	Males	Females
30	0.0366	0.0180
35	0.0867	0.0589
40	0.0999	0.1195
45	0.1369	0.1940
50	0.1979	0.2762
55	0.3302	0.4651

99% of the disability rates stated above are assumed to be attributable to non-occupational disabilities and 1% are assumed to be attributable to occupational disabilities. No occupational disabilities are assumed for judges.

Termination Decrements for Reasons Other Than Death or Retirement: Based on JRS-1 and JRS-2 Experience

Four per 100 participants for members not eligible for service retirement.

Rates of Withdrawal of Employee Contributions

Members eligible to receive a deferred annuity are assumed not to withdraw their contributions. Members not eligible to receive a deferred annuity are assumed to withdraw their contributions.

Percentage of Members Electing Various Benefit Options:

Sex/ Benefit	Standard Life Annuity	Option 1	Option 4
Male Member			
Disability	50%	40%	10%
Service Retirement	100%	0%	0%
Death Benefit Plan	0%	75%	25%
Female Member			
Disability	75%	20%	5%
Service Retirement	100%	0%	0%
Death Benefit Plan	0%	50%	50%

Beneficiary Characteristics: Male member is assumed to be three years older than female beneficiary; and female member is assumed to be the same age as male beneficiary.

Census Data and Assets

- The valuation was based on members of JRS-1 as of August 31, 2016 and does not take into account future members.
- All census data was supplied by ERS and was subject to reasonable consistency checks.
- There were data elements that were modified for some members as part of the valuation in order to make the data complete. However, the number of missing data items was immaterial.

Other Actuarial Valuation Procedures

- No provision was made in this actuarial valuation for the limitations of Internal Revenue Code Sections 415 or 401(a)(17).
- Valuation payroll (earnings applied to the current valuation year) is the expected payroll for the fiscal year following the valuation date. It is based on reported payroll determined from August member contributions increased to reflect the across-the-board salary increases appropriated by the State legislature, effective on or after September 1, and projected according to the actuarial assumptions for the upcoming fiscal year.
- No liability was included for benefits which are funded by special State appropriations.

SUMMARY OF MEMBERSHIP DATA

Active Members

Item	Male	Female	Total
Number of Members	10	0	10
Average Annual Salaries	$ 147,000	N/A	$ 147,000
Average Age	69.8	N/A	69.8
Average Service	30.0	N/A	30.0

Inactive Members

Item	Number	Annual Annuities	Average Annuities	Average Age
Participants with Deferred Benefits	0	$ 0	N/A	N/A
Service Retirees and Beneficiaries	374	$ 25,063,884	67,016	80.2
Disability Retirees	0	$ 0	N/A	N/A
Total	374	$ 25,063,884	$ 67,016	80.2

Non-vested Members

Item	Number	Account Balances	Average Account Balance	Average Age
Non-vested Participants	2	$ 112	$ 56	71.8

GLOSSARY

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ARC.

Actuarial Gain or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.),
b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB.

Actuarial Value of Assets or ***Valuation Assets:*** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ARC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: That portion of the pension plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Actuarially Determined Contribution (ADC) or ***Annual Required Contribution (ARC):*** A calculated contribution for a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Closed Amortization Period: A specific number of years that is counted down by one each year and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: An employer-sponsored retirement benefit that provides workers, upon attainment of designated age and service thresholds, with a monthly benefit based on the employee's salary and length of service. The value of a benefit from a defined benefit plan is generally not affected by the return on the assets that are invested to fund the benefit.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Funding Period or ***Amortization Period:*** The term "Funding Period" is used it two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ARC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

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

PUBLIC AGENDA ITEM - #5a*

Review and Discussion of Investment Performance of the System's Assets:

5a. Fiscal Year 2016 Investment Performance

December 1, 2016

BACKGROUND:

The Board of Trustees (Board) of the Employees Retirement System of Texas (ERS) regularly reviews the performance of the Fund in order to monitor the asset allocation implementation plan and advisory manager selection. Its purpose is to test the continued validity of these decisions and trigger an analysis of underperformance or undue volatility.

ERS' custodian, Bank of New York Mellon Asset Servicing (BNY), who is the official book of record, provides fiscal year-end performance reviews.

Summary of FY 2016 Investment Performance – The ERS Trust Fund (Trust) ended the fiscal year with a market value of assets at $25.5 billion. The total rate of return net of fees for Fiscal Year 2016 was 5.28% compared to the total fund policy benchmark of 7.23%.

Reflected in the following table is a look at how the asset allocation added to and detracted from returns for Fiscal Year 2016:

ERS Performance Results
Plan Level Attribution - Fiscal Year Ending August 31, 2016

	Portfolio		Benchmark		Attribution Effects		
Asset Class	Weight	Return	Weight	Return	Allocation	Selection	Total
Global Public Equity	48.05%	4.77%	47.74%	7.73%	-0.07%	-1.40%	-1.47%
Global Credit	6.95%	8.08%	6.75%	9.12%	-0.01%	-0.08%	-0.09%
Rates	16.61%	3.34%	18.25%	3.11%	0.02%	0.04%	0.06%
Cash	1.16%	0.76%	1.09%	0.23%	-0.03%	-0.01%	-0.04%
Real Estate – Public	2.94%	15.49%	3.00%	16.83%	-0.01%	-0.04%	-0.05%
Real Estate - Private	7.04%	12.80%	7.00%	10.80%	-0.04%	0.14%	0.10%
Global Private Equity	10.93%	5.82%	10.00%	8.03%	0.02%	-0.26%	-0.24%
Absolute Return	5.05%	1.47%	5.00%	4.23%	0.00%	-0.15%	-0.15%
Private Infrastructure	1.17%	-16.35%	1.17%	-16.35%	0.00%	0.00%	0.00%
Special Situations	0.10%	1.93%	0.00%	0.00%	-0.02%	0.01%	-0.01%
Transition Effects**		-0.06%				-0.06%	-0.06%
Total Fund w RM[1]	100.00%	5.28%	100.00%	7.23%	-0.14%	-1.81%	-1.95%

**Total Fund attribution return varies from reported performance returns due to partial year funding/de-funding of asset classes.

STAFF RECOMMENDATION:

This agenda item is provided for informational and discussion purposes only. No action is required.

ATTACHMENT – 1

Exhibit A – Fiscal Year 2016 Investment Performance

** We are accredited by the State Pension Review Board (PRB) as a Minimum Educational Training (MET) sponsor for Texas public retirement systems. This accreditation does not constitute an endorsement by the PRB as to the quality of our MET program. These agenda items may be considered in-house training provided by ERS to board trustees and the system administrator for purposes of fulfilling the MET program requirements. ERS is an accredited sponsor of MET for its system administrator and trustees.*

ERS

Public Agenda Item #5a

Review, Discussion and Consideration of the Investment Performance of the System's Assets:

Fiscal Year 2016 Investment Performance

December 1, 2016

Betty Martin, CPA, Director of Investment Services
Tom Heiner, BNY Mellon

Fiscal 2016 Performance Update

ERS

	Market Value 8/31/2016	1 Year Ending 8/31/2016	3 Year Ending 8/31/2016	5 Year Ending 8/31/2016	10 Year Ending 8/31/2016
Total Fund	***$ 25,499,105,144***	***5.28***	***6.61***	***7.54***	***5.70***
Total Fund Policy Benchmark [c]		***7.23***	***6.87***	***7.64***	***5.40***
Variance		***(1.95)***	***(0.26)***	***(0.10)***	***0.30***
Return Seeking	**19,578,911,607**	**6.02**	**7.72**	**9.01**	
Global Equity	**14,668,983,686**	**5.03**	**7.69**	**9.65**	
MSCI All Country World Index		7.24	6.74	8.32	
Variance		(2.21)	0.95	1.33	
Global Public Equity	12,111,394,524	4.77	6.68	9.14	4.87
Global Public Equity Floating Benchmark [a]		7.73	7.01	9.14	4.76
Variance		(2.96)	(0.33)	(0.00)	0.11
Domestic Public Equity	*5,661,463,713*	*8.43*	*10.99*	*13.87*	*7.23*
S&P 1500/S&P 500 Blended Index		*12.54*	*12.19*	*14.65*	*7.60*
Variance		*(4.11)*	*(1.20)*	*(0.78)*	*(0.37)*
International Public Equity	*5,327,370,919*	*1.29*	*1.90*	*3.76*	*2.12*
MSCI EAFE/MSCI ACWI ex US Blended Index [b]		*2.92*	*2.03*	*3.31*	*1.51*
Variance		*(1.63)*	*(0.13)*	*0.45*	*0.61*
Global Public Equity Special Situations	*719,798,273*	*12.22*			
Directional Growth Portfolio	*322,755,168*	*2.29*			
Global Equity Tactical	*80,006,451*	*(5.41)*			
Private Equity	2,557,589,162	5.82	12.40	11.20	
Global Private Equity Benchmark [j]		8.03	13.47	12.65	
Variance		(2.21)	(1.07)	(1.45)	
Global Credit	**1,984,512,205**	**8.08**	**5.84**		
Barclays U.S. High Yield 2% Issuer Cap Index		9.12	5.41		
Variance		(1.04)	0.43		

Agenda item 5a - Meeting book dated December 1, 2016

** Investment Performance is reported net of investment management fees*

Fiscal 2016 Performance Update

ERS

	Market Value 8/31/2016	1 Year Ending 8/31/2016	3 Year Ending 8/31/2016	5 Year Ending 8/31/2016	10 Year Ending 8/31/2016
Return Seeking (continued)					
Real Assets	**2,823,485,288**	**10.10**	**10.27**	**10.34**	
Real Estate - Public	720,685,319	15.49	9.25	9.35	3.41
Total Public RE Blended Benchmark [d]		16.83	10.60	10.18	3.16
Variance		(1.34)	(1.35)	(0.83)	0.25
Real Estate - Private	1,757,317,432	12.80	13.11	12.03	
Private RE Custom Benchmark [h]		10.80	9.34	8.71	
Variance		2.00	3.77	3.32	
Private Infrastructure	345,482,537	(16.35)	(2.92)		
Special Situations	**101,930,428**				
Risk Reduction	**5,920,193,537**	**2.69**	**2.69**	**1.99**	
Rates	**4,055,950,593**	**3.34**	**2.65**		
Barclays Treasury Intermediate Index		3.11	2.41		
Variance		0.23	0.23		
Cash	**676,342,152**	**0.76**	**1.58**	**0.41**	
91 Day Treasury Bill		0.23	0.10	0.09	
Variance		0.53	1.48	0.32	
Absolute Return	**1,187,900,792**	**1.47**	**4.04**		
Hedge Fund custom benchmark [i]		4.23	4.10		
Variance		(2.76)	(0.06)		
Texas Employees Group Benefits Program (TEGBP)	***431,924,144***	***3.82***	***2.12***	***1.56***	***3.12***
Group Benefits Program Policy Benchmark [e]		***2.49***	***1.80***	***1.35***	***2.80***
Variance		***1.33***	***0.32***	***0.21***	***0.32***

Agenda item 5a - Meeting book dated December 1, 2016

** Investment Performance is reported net of investment management fees*

Fiscal 2016 Performance Update

Internally vs. Externally Managed

ERS

	Market Value 8/31/2016	1 Year Ending 8/31/2016	3 Year Ending 8/31/2016	5 Year Ending 8/31/2016	10 Year Ending 8/31/2016
Global Public Equity	12,111,394,524	4.77	6.68	9.14	4.87
Global Public Equity Floating Benchmark		7.73	7.01	9.14	4.76
Variance		(2.96)	(0.33)	(0.00)	0.11
*Global Public Equity - Internal***	*8,963,147,961*	*6.02*	*7.63*	*9.89*	5.61
Internal Global Public Equity Benchmark [f]		*8.81*	*7.63*	*9.80*	*5.24*
Variance		*(2.79)*	*(0.00)*	*0.09*	0.37
*Global Public Equity - External***	*3,148,246,563*	*2.08*	*4.65*	*7.50*	
External Global Public Equity Benchmark [g]		*4.60*	*5.33*	*7.55*	
Variance		*(2.52)*	*(0.68)*	*(0.05)*	
Domestic Public Equity - Internal	*4,876,136,342*	*8.49*	*11.13*	*13.95*	*7.71*
Domestic Public Equity - External	*785,327,371*	*8.17*	*10.37*	*13.61*	*5.39*
International Public Equity - Internal	*3,287,206,895*	*2.25*	*1.94*	*2.98*	*1.70*
International Public Equity - External	*2,040,164,024*	*(0.19)*	*1.79*	*4.65*	*2.46*
Global Credit	1,984,512,205	8.08	5.84		
Barclays U.S. High Yield 2% Issuer Cap Index		9.12	5.41		
Variance		(1.04)	0.43		
Global Credit - Internal	*1,658,820,405*	*9.42*	*6.31*		
Barclays U.S. High Yield 2% Issuer Cap Index		*9.12*	*5.41*		
Variance		*0.30*	*0.90*		
Global Credit - External	*325,691,800*	*1.63*	*4.51*		
Barclays U.S. High Yield 2% Issuer Cap Index		*9.12*	*5.41*		
Variance		*(7.49)*	*(0.90)*		

** Investment Performance is reported net of investment management fees*

*** Includes Global Pub Eq Spec Sit, Directional Growth, and Global Equity Tactical*

Fiscal 2016 Performance Update

Footnotes

[a] *The Global Public Equity Benchmark consists of the S&P 1500 and MSCI ACWI ex US Net using actual portfolio weights through 8/31/14 and the MSCI All Country World Net from 9/1/14 through 8/31/15. Starting 9/1/15 the benchmark is the MSCI ACWI IMI USA*

[b] *The Total International Public Equity Benchmark consists of the MSCI EAFE Net January 1999 through August 2008 and the MSCI ACWI ex US Net thereafter.*

[c] *The Total Fund Policy Benchmark is currently comprised of the MSCI ACWI IMI USA Gross, Barclays US High Yield 2% Issuer Cap, FTSE EPRA/NAREIT Blend, NCREIF ODCE NET (1 month in arrears), Barclays Intermediate Treasury, BofA Merrill Lynch 3 Month Treasury Bill + 4% (lagged 1 month), BofA Merrill Lynch 3 Month Treasury Bill, MSCI ACWI IMI USA Gross + 300 bps, and the actual return for Private Infrastructure.*

[d] *The Total Public Real Estate Blended Benchmark consists of the MSCI REIT from March 2005 - March 2007, a floating weight benchmark comprised of the EPRA/NAREIT US and EPRA/NAREIT US Global ex US from April 2007 through December 2007, the EPRA NAREIT Global Index from January 2008 through August 2013, the FTSE EPRA/NAREIT Developed Net from September 2013 through August 2014,and a MV weighted blend of the Total Internal Public RE Benchmark and the Wells St. Partner custom benchmark from September 2014 through March 2016. Effective April 2016, the benchmark is 100% FTSE EPRA/ NAREIT Developed Net.*

[e] *The Group Benefits Program Policy benchmark is comprised of 40% Barclays Capital Aggregate and 60% 91 Day T-Bill.*

[f] *The Total Internal Global Public Equity Benchmark utilizes actual portfolio market value weights against associated member indices through 8/31/14, the MSCI All Country World Net from 9/1/14 through 8/31/15 and then reverts back to using the market value weighted process effective 9/1/15.*

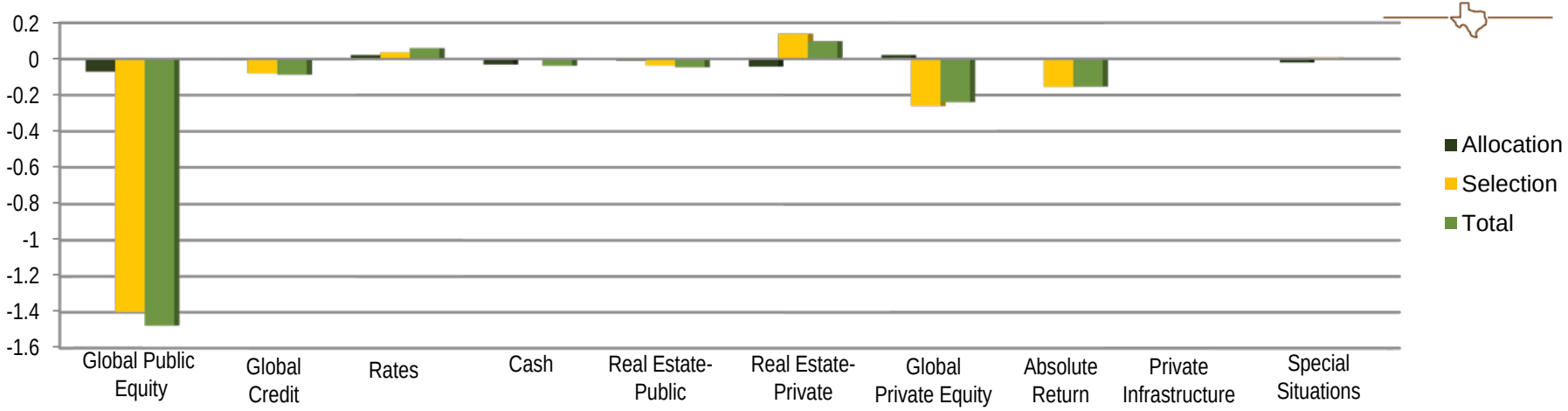
[g] *The Total External Global Public Equity Benchmark utilizes actual portfolio market value weights against associated member indices through 8/31/14, the MSCI All Country World Net from 9/1/14 through 8/31/15 and then reverts back to using the market value weighted process effective 9/1/15.*

[h] *The Private RE Custom Benchmark consists of the 91 Day T-Bill + 4% RE benchmark from 9/1/2012 through 8/31/14 and the NCREIF NFI-ODCE Net 1 month lagged beginning 9/1/14.*

[i] *The Hedge Fund Custom Benchmark consists of the 91 Day T-Bill + 4% through 8/31/14 and the 91 Day T-Bill + 4% 1 month lagged beginning 9/1/14.*

[j] *The Global Private Equity Benchmark is the actual gross of fees return of the Global Private Equity Composite from 9/1/11 through 8/31/15. Beginning 9/1/15, the benchmark is the MSCI ACWI IMI USA Gross Index plus 300 bps.*

Fiscal 2016 Performance Attribution

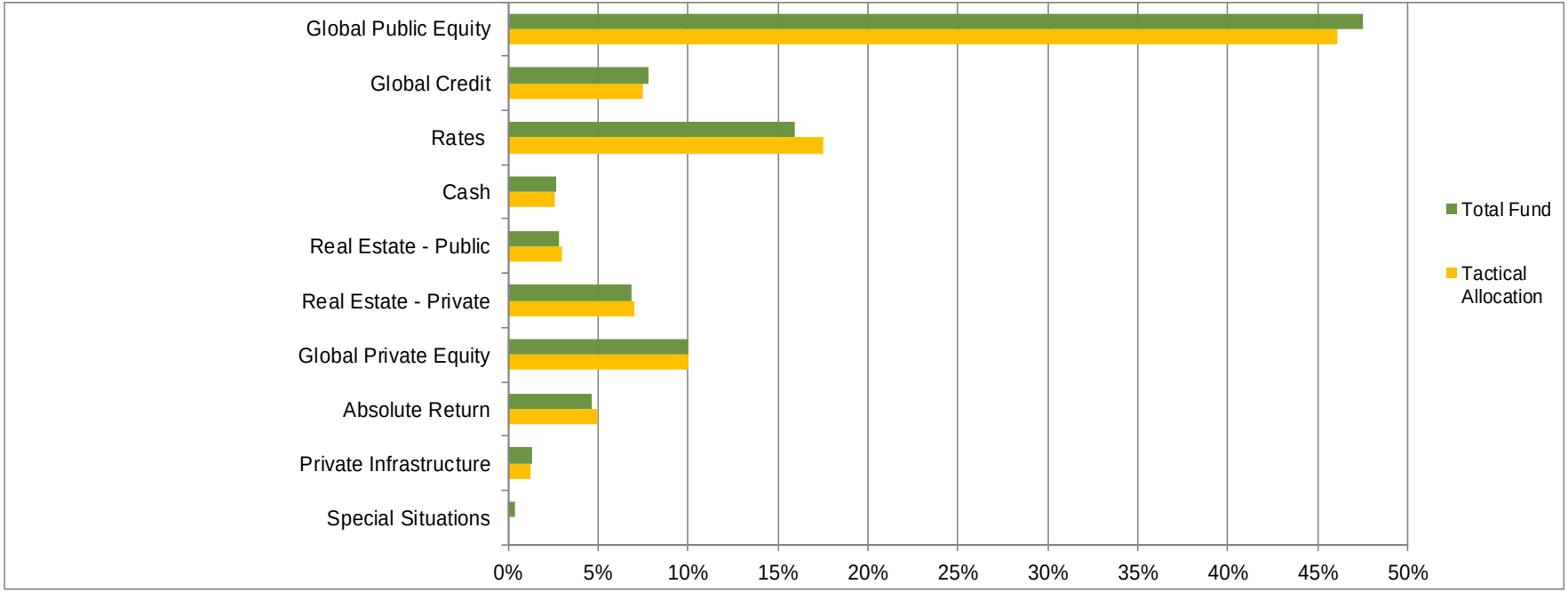


	Portfolio		Benchmark		Attribution Effects		
Asset Class	**Weight**	**Return**	**Weight**	**Return**	**Allocation**	**Selection**	**Total**
Global Public Equity	48.05%	4.77%	47.74%	7.73%	-0.07%	-1.40%	**-1.47%**
Global Credit	6.95%	8.08%	6.75%	9.12%	-0.01%	-0.08%	**-0.09%**
Rates	16.61%	3.34%	18.25%	3.11%	0.02%	0.04%	**0.06%**
Cash	1.16%	0.76%	1.09%	0.23%	-0.03%	-0.01%	**-0.04%**
Real Estate – Public	2.94%	15.49%	3.00%	16.83%	-0.01%	-0.04%	**-0.05%**
Real Estate - Private	7.04%	12.80%	7.00%	10.80%	-0.04%	0.14%	**0.10%**
Global Private Equity	10.93%	5.82%	10.00%	8.03%	0.02%	-0.26%	**-0.24%**
Absolute Return	5.05%	1.47%	5.00%	4.23%	0.00%	-0.15%	**-0.15%**
Private Infrastructure	1.17%	-16.35%	1.17%	-16.35%	0.00%	0.00%	**0.00%**
Special Situations	0.10%	1.93%	0.00%	0.00%	-0.02%	0.01%	**-0.01%**
Transition Effects**		-0.06%				-0.06%	**-0.06%**
Total Fund w RM[i]	**100.00%**	**5.28%**	**100.00%**	**7.23%**	**-0.14%**	**-1.81%**	**-1.95%**

Agenda item 5a - Meeting book dated December 1, 2016

**Total Fund attribution return varies from reported performance returns due to partial year funding/de-funding of asset classes.

Fiscal Year End Asset Allocation



Agenda item 5a - Meeting book dated December 1, 2016

Questions?

PUBLIC AGENDA ITEM - #5b*

Review and Discussion of Investment Performance of the System's Assets:

5b. Fiscal Year 2016 Global Investment Performance Standards Report

December 1, 2016

BACKGROUND:

ERS has undergone a Global Investment Performance Standards (GIPS) verification of their performance reporting for the year ended August 31, 2016. Endorsed by more than 30 country sponsors globally, the GIPS standards provide guidance on the calculation and presentation of performance to ensure a level playing field for evaluating investment results. The GIPS standards allow investors and others to compare investment performance on a consistent basis because claiming compliance means adhering to a set of comprehensive standards that include data calculation methodology, composite construction, disclosures, and presentation and reporting, among others.

History of the GIPS standards:

This need for a practitioner-driven set of ethical principles and a standardized, industry-wide approach to calculating and reporting investment results led the Association for Investment Management and Research (AIMR®, now known as the CFA Institute) to sponsor, develop, and publish a minimum global standard by which firms could calculate and present their investment results. The foundation for the GIPS standards was first established in 1987, with the creation of the AIMR Performance Presentation Standards (AIMR-PPS®), which are voluntary performance guidelines for the North American investment management industry.

To develop one globally accepted set of standards, the GIPS committee began work in 1995. AIMR published the GIPS standards for public comment in February 1998, after circulating several drafts among industry participants to obtain their acceptance of the concepts of the Standards. After an extensive period of public comment, the AIMR Board of Governors formally endorsed the GIPS standards in February 1999.

On February 4, 2005, the CFA Institute Board of Governors approved the revised GIPS standards, which created a single global standard of investment performance reporting. The GIPS standards replaced the various country-specific performance standards and are widely accepted among the international industry of investment managers.

Since their introduction in 1999, the GIPS standards have gathered momentum with investment management firms worldwide adopting these voluntary, ethical standards for calculating and presenting historical investment performance.

While initially adopted primarily by investment management firms, asset owners, including pension funds, have recently begun to seek compliance with the GIPS standards as a way to demonstrate five important things to legislative bodies, oversight boards, and the general public: (1) a voluntary commitment to follow global industry standards (with respect to performance calculation and presentation) based on the principles of fair representation and full disclosure; (2) adherence to best practice with respect to the valuation of investments; (3) the establishment of robust investment performance policies and

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procedures; (4) a commitment to methods of calculation and presentation of investment performance that are consistent, transparent, and comparable; and (5) a commitment to adopt the same set of performance standards often required of any external investment managers.

STAFF RECOMMENDATION:

The agenda item is presented for information and discussion purposes only. No action is required.

ATTACHMENT – 1

Exhibit A – August 31, 2016 Verification Report by ACA Compliance Group

Employees Retirement System of Texas
Verification Report

August 31, 2016

ACA
COMPLIANCE GROUP
PERFORMANCE SERVICES

ACA
COMPLIANCE GROUP
PERFORMANCE SERVICES

Verification Report

Employees Retirement System of Texas
200 E. 18th Street
Austin, TX 78701

We have verified whether Employees Retirement System of Texas (the Firm) (1) complied with all the composite construction requirements of the Global Investment Performance Standards (GIPS®) on a firm-wide basis for the periods from September 1, 2009 through August 31, 2016, and (2) designed its policies and procedures to calculate and present performance in compliance with the GIPS standards as of August 31, 2016. The Firm's management is responsible for compliance with the GIPS standards and the design of its policies and procedures. Our responsibility is to express an opinion based on our verification. We conducted this verification in accordance with the required verification procedures of the GIPS standards. We also conducted such other procedures as we considered necessary in the circumstances.

In our opinion, the Firm has, in all material respects:

- Complied with all the composite construction requirements of the GIPS standards on a firm-wide basis for the periods from September 1, 2009 through August 31, 2016; and
- Designed its policies and procedures to calculate and present performance in compliance with the GIPS standards as of August 31, 2016.

This report does not relate to or provide assurance on any composite compliant presentation of the Firm and does not ensure the accuracy of any specific composite compliant presentation.

ACA Performance Services, LLC

ACA Performance Services, LLC
October 7, 2016

Employees Retirement System of Texas
Total Fund Composite
September 1, 2009 through August 31, 2016

				As of August 31		3-Year Annualized Standard Deviation	
Fiscal Year	Net of External Costs Only[1] (%)	Net of Fees[2] (%)	Benchmark Return (%)	Externally Managed Assets (%)	Total Composite Assets ($ millions)	Total Fund (Net) %	Benchmark %
2010	6.48	6.40	6.80	19	20,389.8		
2011	12.36	12.28	12.02	22	22,118.6		
2012	8.04	7.95	8.11	28	22,771.3		
2013	9.87	9.78	9.52	33	23,858.8	8.37	8.66
2014	14.58	14.48	15.00	37	26,131.6	7.43	7.67
2015	0.44	0.34	(1.03)	38	25,177.9	5.32	5.51
2016	5.28	5.17	7.23	37	25,499.11	6.01	6.77

The Employees Retirement System of Texas ("ERS") claims compliance with the Global Investment Performance Standards ("GIPS"®) and has prepared and presented this report in compliance with the GIPS standards. ERS has been independently verified for the period September 1, 2009 through August 31, 2016. The verification report is available upon request.

Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

Accompanying Notes

1) For purposes of complying with the GIPS standards, the firm is defined as the Employees Retirement System of Texas ("ERS"), which was established in 1947 by the Texas State Legislature and is the manager of the assets of the Employees Retirement System of Texas. The Total Fund was created and incepted in 1947.

2) The Total Fund Composite includes all the discretionary assets managed by ERS for the benefit of participants in the Employees Retirement System of Texas Plan, the Judicial Retirement System Plan II (JRS II) and the Law Enforcement and Correctional Officer Supplemental Plan ("LECOS"). The Total Fund blended benchmark is calculated monthly using a blend of the asset class benchmarks based on the Total Fund's tactical weights for the respective asset classes. Each asset class utilizes a total return benchmark. The asset class weights listed below are as of August 31, 2016. Information for benchmark strategic weights and asset class weights for other periods is available upon request.

[1] Returns net of external costs are net of transaction costs and investment management fees only. These returns are also reported by ERS custodian as "net of fees".

[2] Returns net of fees as defined by GIPS are net of transactions costs, investment management fees and internal Investment Division and other agency overhead costs.

Asset Class/Composite	Description	Benchmark	Benchmark Weights at August 31, 2016 (%)	Asset Class Weights at August 31, 2016 (%)
Global Public Equity	The global public equity asset class is a combination of a variety of strategies across different geographies and market capitalization ranges with aggregate portfolio holdings and characteristics similar to the broader market as represented by the established benchmark.	MSCI All Country World IMI with USA Gross Index Net	46.14	47.50
Global Private Equity	Private equity investments involve the purchase of illiquid equity and debt securities of companies that, in most instances, are not publicly traded. Investments in private company securities are made primarily through blind pool limited liability vehicles such as limited partnerships.	MSCI ACWI IMI + 3%	10.00	10.03
Global Credit	The global credit asset class is a combination of high yield, bank loans and emerging market debt. The high yield fixed income portfolio includes a combination of bonds with a credit rating below investment grade. The bank loan portfolio includes loans made to businesses with credit ratings that are below investment grade, similar to high yield bonds. Loans are typically secured by the assets of the issuing company and rank first in priority of payment in event of default. As a result, default rates tend to be lower than those from high yield bonds and the recovery rates are higher. The emerging market debt portfolio includes U.S. dollar and local denominated bonds issued in or by emerging countries or entities within such countries. The portfolio also includes U.S. dollar denominated corporate bonds issued in emerging countries.	Barclays U.S. High Yield 2% Issuer Cap Index	7.50	7.78
Public Real Estate	The public real estate portfolio includes domestic and international public investments in real estate investment trusts.	Total Public RE Blended BM	3.00	2.83

Asset Class/Composite	Description	Benchmark	Benchmark Weights at August 31, 2016 (%)	Asset Class Weights at August 31, 2016 (%)
Private Real Estate	The private real estate portfolio includes domestic and international private and debt investments. Vehicles established to own interests in real property and related assets primarily through limited liability entities such as limited partnerships or limited liability companies may be used.	NCREIF ODCE Net Index (1 month in arrears)	7.00	6.89
Private Infrastructure	Infrastructure investments refer to the investment in large-scale public systems, services, and facilities that are necessary for economic activity. An infrastructure investment is typically focused on generating income (often with inflation linkage) with some capital appreciation. The low liquidity investments are often made in essential services, with high barriers to entry, and predictable cash flows.	Actual Return	1.28	1.35
Rates	The intermediate treasury portfolio consists of liquid United States Treasury Notes with maturities ranging between 1 to 10-years. There are approximately 200 such securities available with a combined market value of over $500 billion.	Barclays Intermediate Treasury Index	17.50	15.91
Cash	The cash portfolio is managed to maintain liquidity and preserve principal with a maximum final maturity of 18 months and with a minimum credit quality rating of A.	Merrill Lynch 3 Month Treasury Bill	2.58	2.65
Hedge Funds	This strategy includes private commingled investment vehicles with transparency that (1) issue securities only to accredited investors or qualified purchasers through limited liability vehicles such as limited partnerships or limited liability companies; and (2) engage primarily in the trading of securities and other financial instruments. In this policy, hedge fund also includes any private investment fund of funds or other commingled vehicle that itself invests in hedge funds.	90 Day T-Bill + 4% (1 month in arrears)	5.00	4.66

Asset Class/Composite	Description	Benchmark	Benchmark Weights at August 31, 2016 (%)	Asset Class Weights at August 31, 2016 (%)
Special Situations	Special Situations exist to promote innovation and facilitate improving total fund risk-adjusted returns with new investment strategies and mandates. Special Situations encompass a broad range of investment strategies that may fall outside of traditional asset classes.	MSCI World Health Net (1 month in arrears)	0.00	0.40

The public assets of ERS are managed in accordance with the active risk budget as noted in Addendum III of the Investment Policy. The Investment Policy is available upon request. The investment objective for the Total Fund is to earn, over at least a moving thirty year period, an annualized return that equals or exceeds the actuarial rate of return, approved by the Employees Retirement System Board ("Board") to value the liabilities of ERS. As of August 31, 2014, the actuarial rate of return is 8.0%. ERS hires external managers to actively manage selected portfolios. The percent of externally managed assets for the Total Fund was 37% as of August 31, 2016.

3) Net of fees returns are net of brokerage commissions, expenses related to trading and applicable foreign withholding taxes on dividends, interest and capital gains, actual investment management fees and internal Investment Division and other agency overhead costs. All returns and asset values are expressed in U.S. dollars.

   Total Fund performance is calculated monthly using time-weighted rates of return reduced by internal division and agency overhead costs applied on an annual basis. Overhead costs netted against returns include information services, in-house and external legal counsel, finance, executive office, human resources and building operations.

   Policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

4) The Total Fund Composite included all individual portfolios that are combined into one aggregate portfolio. The performance of the combined portfolio reflects the overall mandate of the plan. Because the Total Fund Composite is one aggregate portfolio for all periods, no measure of internal dispersion of annual portfolio returns is presented.

5) The three-year annualized ex-post standard deviation measures the variability of the composite and the benchmark for the 36-month period. This measure is not required for periods ended prior to 31 August 2012.

6) Because the Total Fund Composite represents 100% of the assets managed by ERS, this presentation represents ERS' list of composite descriptions.

Supplemental Information:

The information in the table below is supplemental to the Total Fund compliant presentation presented on the previous pages. Performance information is for the period September 1, 2015 through August 31, 2016, except as noted, and is net of external management fees.

Fund/Asset Class	Net Return (%)	Benchmark Return (%)	Number of Portfolios	Assets ($ millions)	% of Fund Assets	% Externally Managed
Total Fund	5.28	7.23	44	25,499.11	100.0	37.0
Global Public Equity	4.77	7.73	20	12,111.39	47.4	26.0
Global Private Equity	5.82	8.03	2	2,557.59	10	100.0
Global Credit	8.08	9.12	9	1,984.51	7.8	23.1
Public Real Estate	15.49	16.83	2	720.69	2.8	0.0
Private Real Estate	12.80	10.80	2	1,757.32	6.9	100.0
Private Infrastructure	-16.35		1	345.48	1.4	100.0
Special Situations	1.93	5.38	1	101.93	0.4	100
Rates	3.34	3.11	5	4,055.95	15.9	0.0
Cash	0.76	0.23	1	676.34	2.7	0.0
Hedge Funds	1.47	4.23	1	1,187.90	4.7	100.0

PUBLIC AGENDA ITEM - #5c*

Review and Discussion of the Investment Performance of the System's Assets:

5c. Third Calendar Quarter of 2016 Investment Performance

December 1, 2016

BACKGROUND:

In accordance with the contract for performance evaluation services and Section 3 of the Employees Retirement System (ERS) *Investment Policy*, Aon Hewitt Investment Consulting, Inc. (AHIC) reviews and evaluates, on a quarterly basis, the Employees Retirement System of Texas (ERS) investment performance as calculated by ERS custodian BNY Mellon.

Summary of Investment Markets:

A strong quarter for equity markets, with Emerging Markets and Japan leading the way. The result of the UK's EU referendum and the resultant sharp downgrade to monetary policy expectations, not just in the UK but across the developed world, boosted equity returns. Over the quarter the MSCI All Country World IMI returned 5.7%. U.S. equities (S&P 1500) returned 4.0% over the quarter. The MSCI Emerging Market Index (9.0%), MSCI Japan (8.5%) and MSCI Australia (8.3%) were the strongest performers as a delay to Fed rates hikes and a weaker U.S. dollar supported sentiment in these markets. In a quarter of strong equity markets, the smallest gains were seen in the U.S. (4.0%) and the UK (4.5%). Trailing 1-year global equity returns (MSCI ACW IMI) were 12.6%. U.S. equities returned a strong 15.5% over the trailing 1-year period.

U.S. economic growth picture mixed over the summer - There have been clear indications since the start of the year that U.S. economic growth momentum has slowed compared with 2015, and the mixed third quarter dataflow did not alter this trend. The closely watched ISM index of manufacturing sector activity dipped to 49.4, indicating mild contraction, for the first time since February, before rebounding in September to 51.5. The average reading since the start of 2015 has been a meagre 51, which shows that growth has been moderate at best. The average ISM reading in 2013 and 2014 was 54.7. The labor market disappointed expectations in the latest (August) reading, with 151k jobs added to non-farm payrolls and the unemployment rate unchanged at 4.9%. The latest reading on consumer confidence was the highest for almost a decade, with respondents to the survey citing optimism about employment conditions in the short term.

The Federal Reserve hits the pause button - Weaker economic data reduced the likelihood of the Fed's rate hike plans but the result of the UK's EU Referendum increased global risk aversion sharply in the subsequent days and prompted the Fed to delay rate hikes. Interest rates were not changed throughout the quarter but the commentary by various Fed officials gradually lost its dovish tone, as it became clear that the initial reaction to the referendum was overblown. This culminated in the September meeting in which the statement accompanying the announcement of unchanged interest rates indicated that a rate increase was a distinct possibility in December.

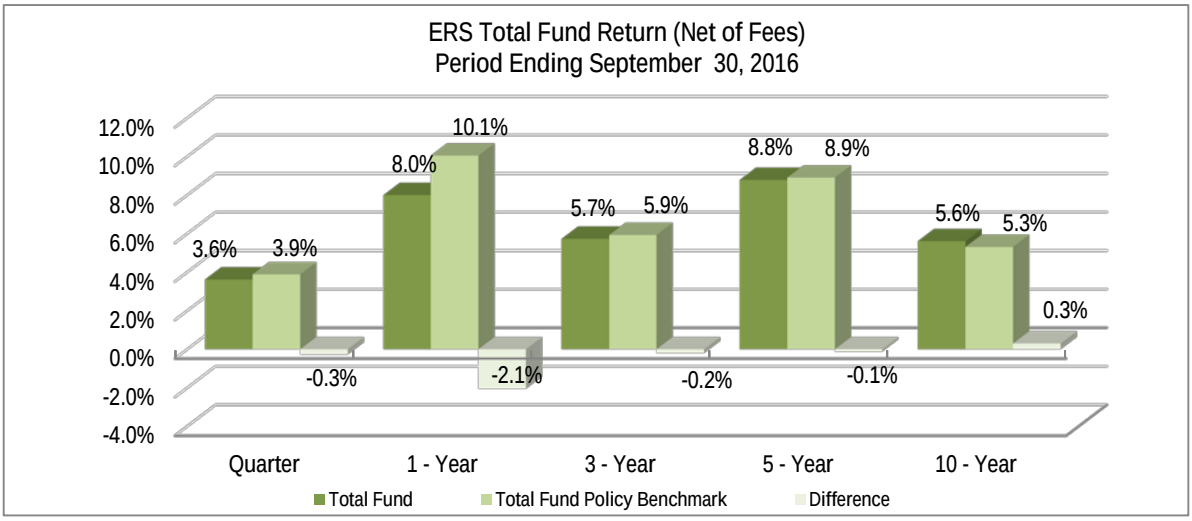
European growth remained moderate - There was little to report in terms of the Eurozone economy over the third quarter. Second quarter growth was reported to have slowed to 0.3% from the previous quarter's 0.5%, but the forward looking purchasing managers' index hit a 3 month high in September (at 52.6) while the unemployment rate, while still a high 10.1%, maintained a 5-year low level. Overall, the economy is growing moderately but with little sign of a return to sustained strength. The European Central Bank (ECB) decided to keep its accommodative monetary policy unchanged over the quarter. The ECB has been buying €80bn of bonds per month while keeping the bank deposit rate negative for most of this year but inflation remains low, rising to 0.4% in September.

Emerging markets benefit from global easing - Emerging market economies have performed better this year as the price of oil has stabilized, China has introduced fresh stimulus measures and U.S. monetary policy tightening has been gradual. These factors remained broadly in place in the third quarter, apart from a small decline in the oil price. The broad commodity index (S&P GSCI Commodity Index) fell 4.2% over the quarter, as Energy (S&P GSCI Energy) weighed on performance, falling by 2.7%. Industrial metals prices (S&P GSCI Industrial Metals) rallied by 3.7%, boosted by Chinese stimulus and imports.

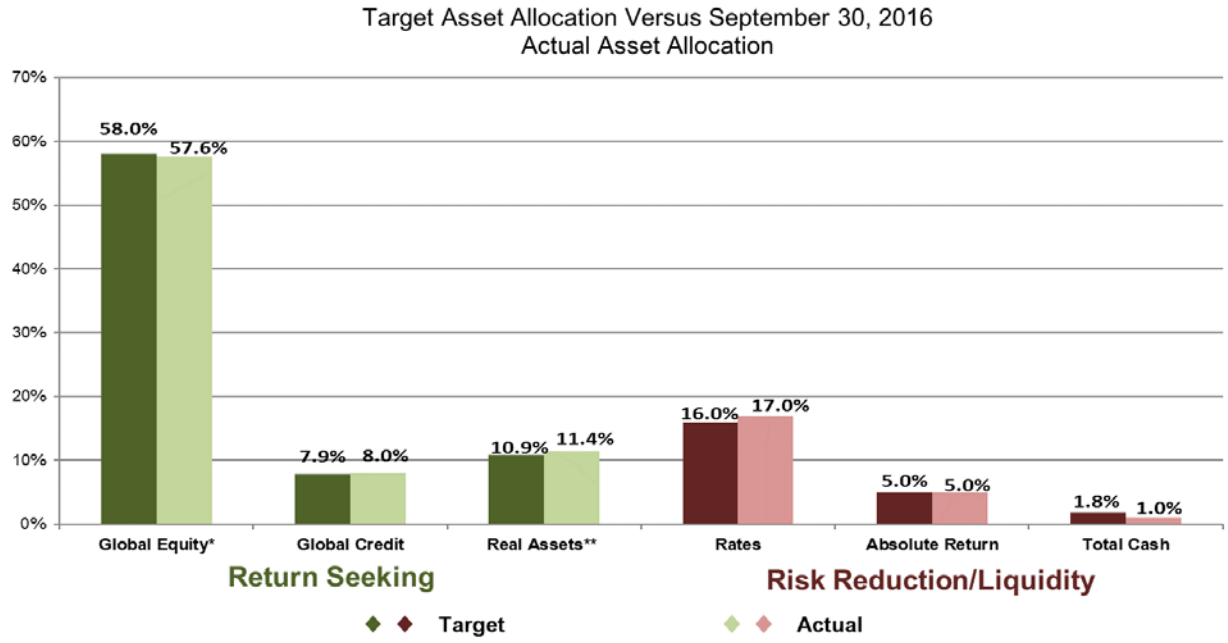
** We are accredited by the State Pension Review Board (PRB) as a Minimum Educational Training (MET) sponsor for Texas public retirement systems. This accreditation does not constitute an endorsement by the PRB as to the quality of our MET program. These agenda items may be considered in-house training provided by ERS to board trustees and the system administrator for purposes of fulfilling the MET program requirements. ERS is an accredited sponsor of MET for its system administrator and trustees.*

Yields rebound from all-time lows - 10 year U.S. Treasury yields fell in mid-July to an all-time low of 1.38% following the risk aversion triggered by the UK referendum result. As worries have eased yields began to rise, with the 10-year yield finishing the quarter at a still historically low 1.62%. The Barclays 30 Year Treasury Index returned -2.0%, while the Barclays Intermediate Treasury Index returned -0.3%. In the corporate sector, high yield outperformed investment grade credit, returning 5.6% (Barclays High Yield Index), versus 1.2% for investment grade credit (Barclays Credit Index).

Summary of ERS Performance:



ERS continues to maintain reasonable allocations relative to its strategic and long-term allocation targets as reflected in the following chart.



*Includes Domestic and International Equity, along with Global Equity Tactical, Directional Growth Portfolio, Global Public Special Situations, and Private Equity

**Includes Public Real Estate, Private Real Estate, and Infrastructure

STAFF RECOMMENDATION:

This agenda item is provided for informational and discussion purposes only. No action is required.

ATTACHMENT – 1

Exhibit A – Employees Retirement System of Texas Performance Report, Second Calendar Quarter Ending September 30, 2016 by Aon Hewitt Investment Consulting, Inc. *(Included under separate cover)*

Employees Retirement System of Texas | Third Quarter 2016

Quarterly Investment Review

Visit the Aon Hewitt Retirement and Investment Blog *(http://retirementandinvestmentblog.aon.com); sharing our best thinking.*

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Executive Summary

Empower Results®

Public Agenda Item #5c

Review and Discussion of Investment Performance for 3rd Calendar Quarter of 2016

December 1, 2016

Sharmila Kassam, CPA, Deputy Chief Investment Officer
Kristen Doyle & Steve Voss, Aon Hewitt

ERS Trust Fund Dashboard

Performance

Fund	CYTD	FYTD
Performance:	5.4%	0.6%
Benchmark:	6.8%	0.5%
Excess Return:	-1.4%	0.1%
3-Yr Tracking error		1.37

Largest Contributors (quarter):

- Outperformance of the absolute return portfolio
- Outperformance of the private real estate component

Largest Detractors (quarter):

- Underperformance of the strategies within the domestic equity and directional growth portfolio
- Underperformance of the private equity portfolio

Profile

Market Value at 9/30/16:
$25.6 Billion

Actuarial Accrued Liability 8/31/15:
$33.9 Billion

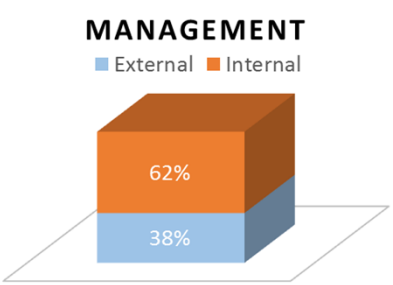
Retirees and Beneficiaries 8/31/15:
100,716

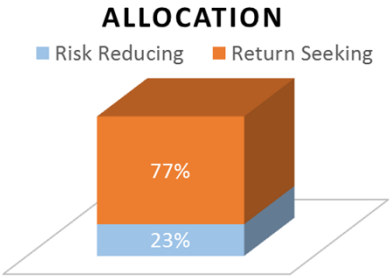
Retirement Payments Annually 8/31/15:
$2.1 Billion

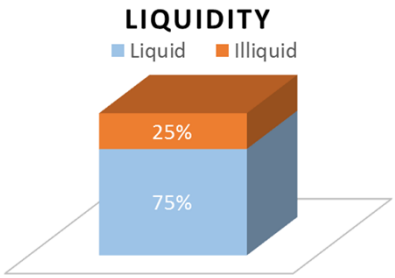
ERS Trust Funding Ratio 8/31/15:
76.3%

Compliance

Asset Allocation Compliance: Yes
Tracking Error Compliance: Yes
Investment Policy Compliance: Yes







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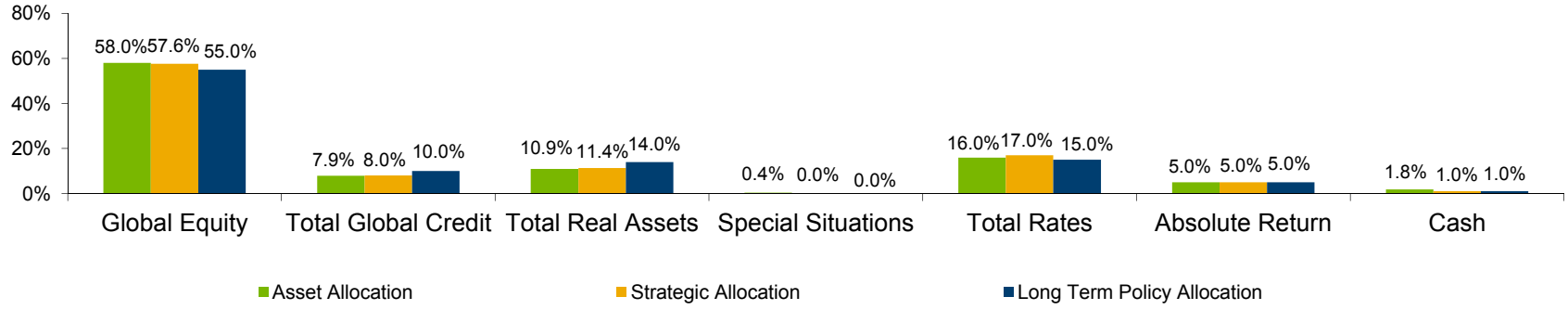
Total Fund: Asset Allocation

Summary of Cash Flow

	1 Quarter	Fiscal YTD	1 Year
Total Fund			
Beginning Market Value	24,685,204,418	25,499,105,144	24,533,633,307
+ Additions / Withdrawals	-219,154,046	-80,485,950	-893,842,755
+ Investment Earnings	1,104,336,602	151,767,780	1,930,596,422
= Ending Market Value	**25,570,386,973**	**25,570,386,973**	**25,570,386,973**

Employees Retirement System of Texas -
Quarterly Asset Allocation Including Risk Management vs. Policy Target as of 9/30/2016



[1] All returns contained in this report are shown net of investment management fees. All returns longer than 1-year are annualized.
[2] Source data can be found on pages 31 and 40 of full report.

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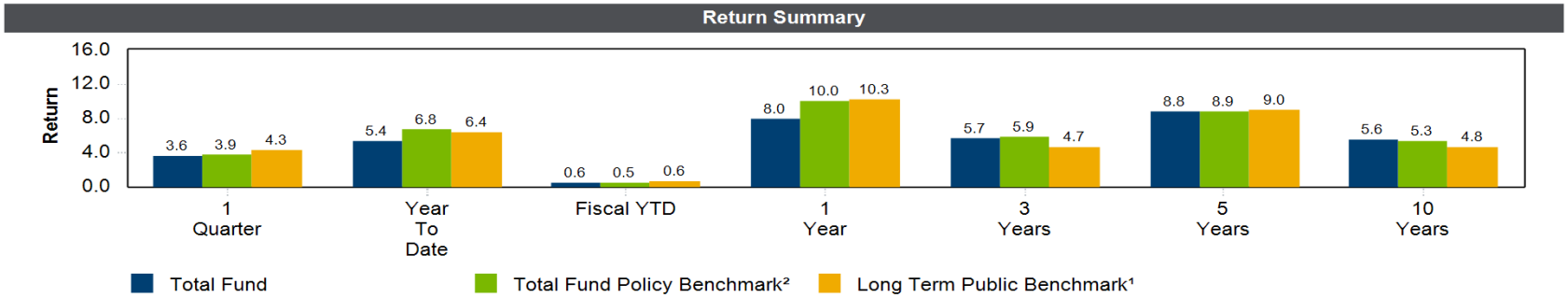
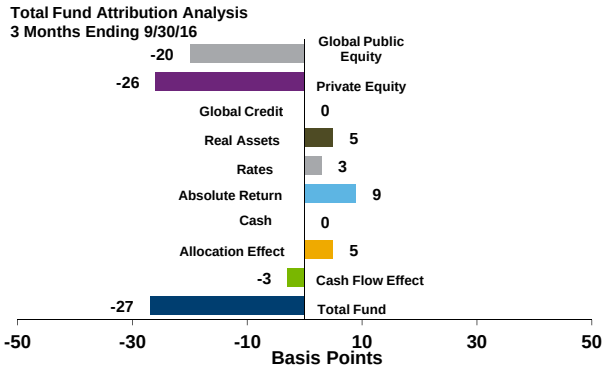
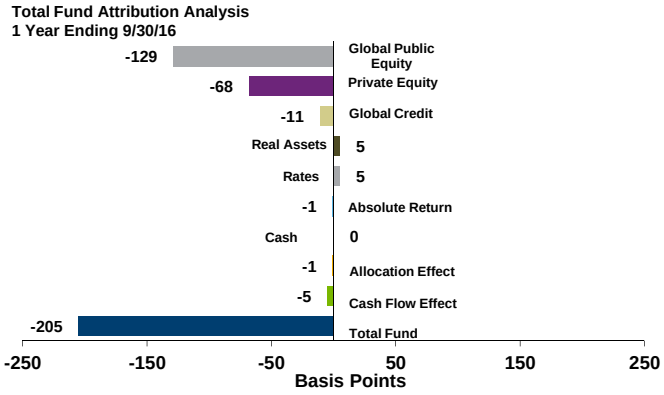
Total Fund: Performance







[1]The Long Term Public Benchmark is a is a combination of 79% MSCI ACW IMI and 21% Barclays Intermediate Treasury Index.
[2]A detailed description of the Policy Index as of 9/30/2016 is provided in the appendix of the full report.
[3]Source data can be found on pages 30 and 32 of full report.

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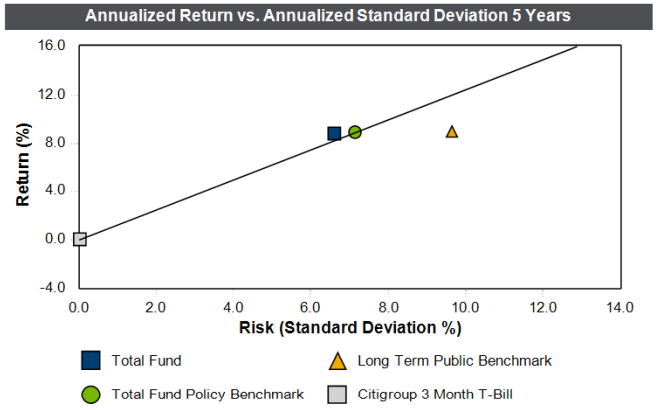
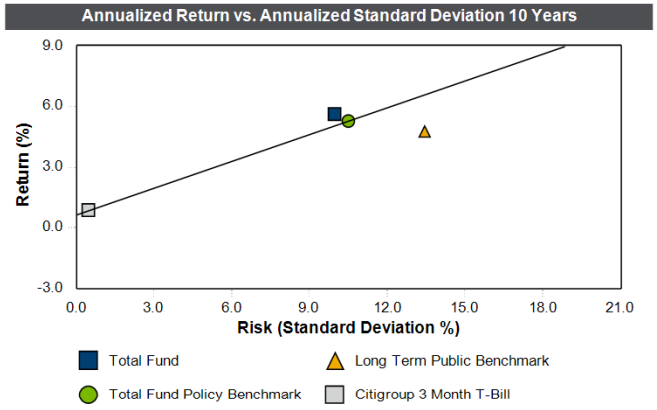
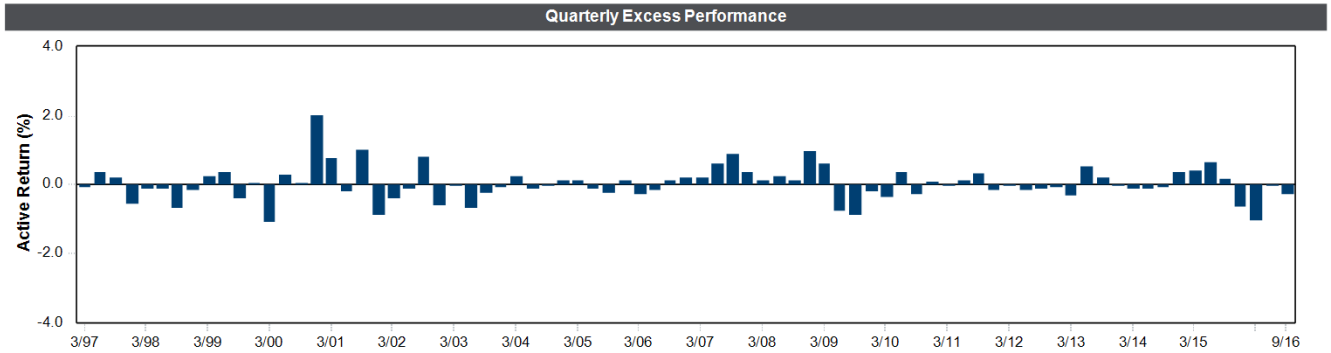
Total Fund: Risk







[1] Source data can be found on page 32 and 39 of full report.

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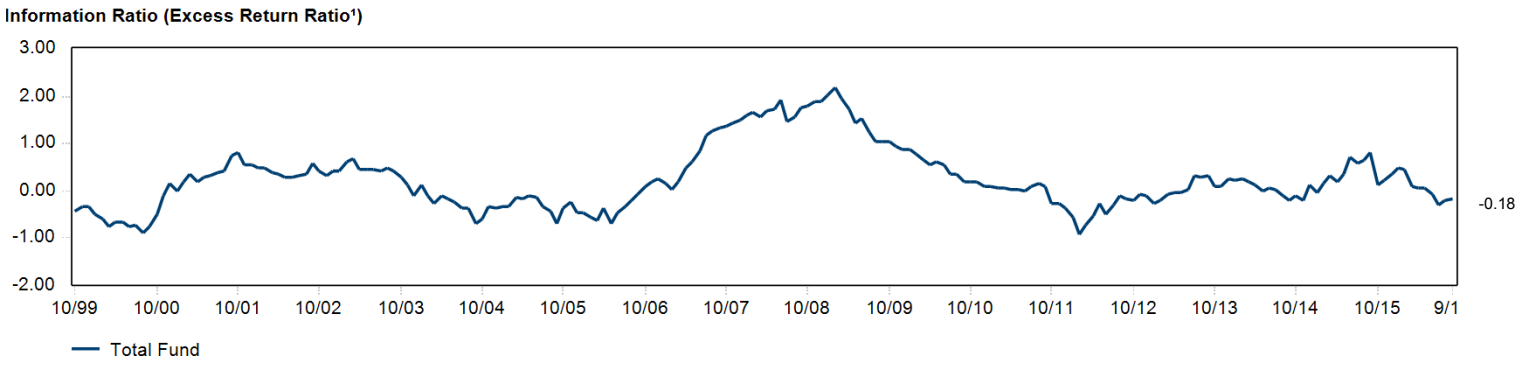
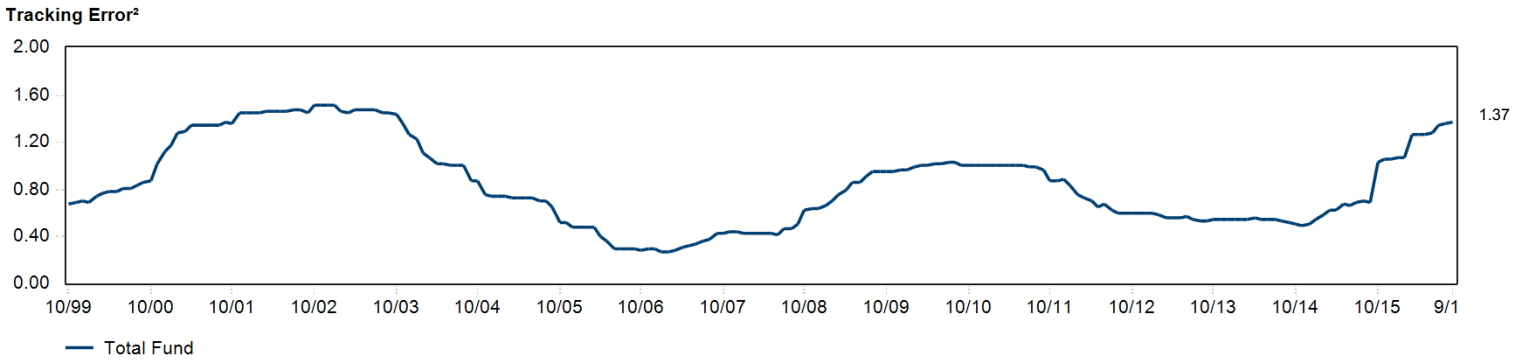
Total Fund: Rolling Information Ratio and Tracking Error (36 months)





[1] Measured by dividing the active rate of return by the tracking error. The higher the Information Ratio, the more value-added contribution by the manager.
[2] A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.

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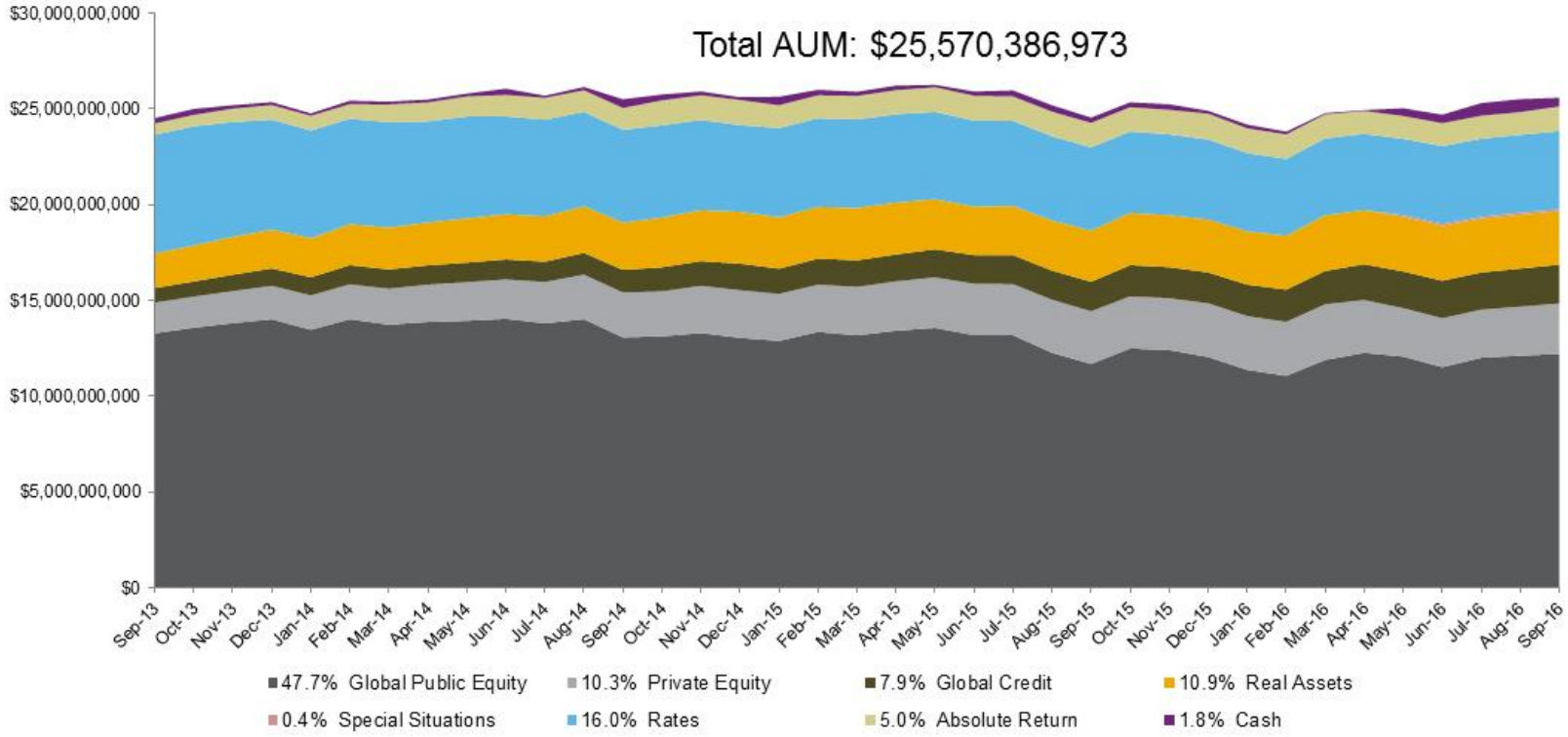
ERS Asset Allocation Evolution



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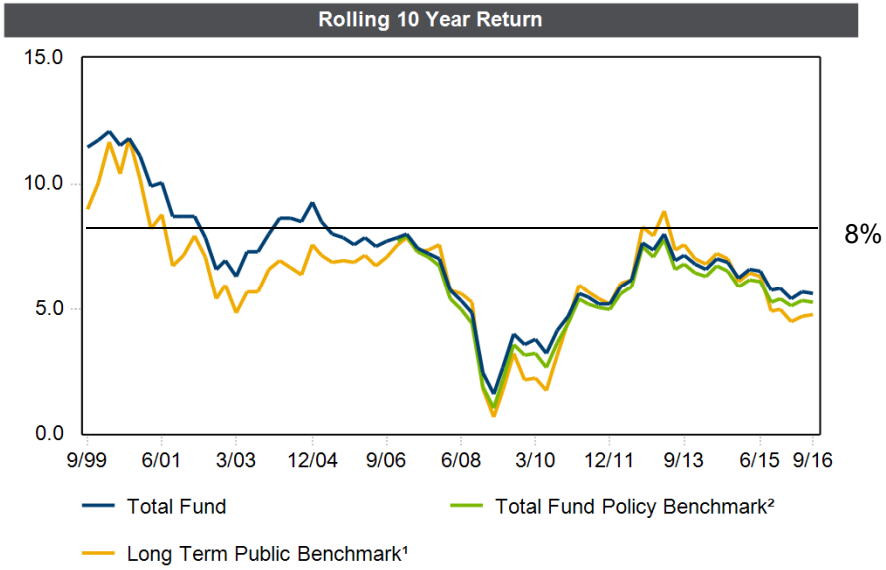
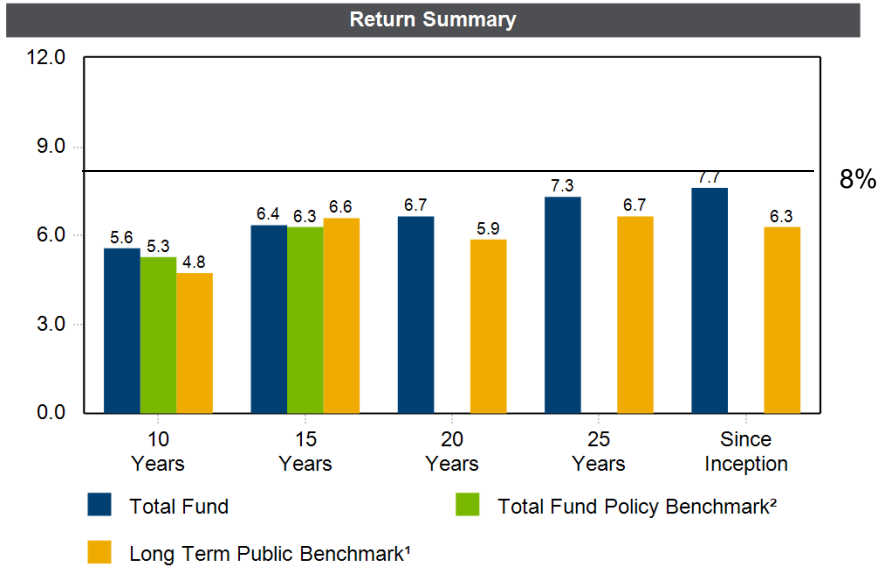
Long Term Investment Results





[1]The Long Term Public Benchmark is a is a combination of 79% MSCI ACW IMI and 21% Barclays Intermediate Treasury Index.
[2]The Total Fund Policy Benchmark has an inception date of 11/30/1996.

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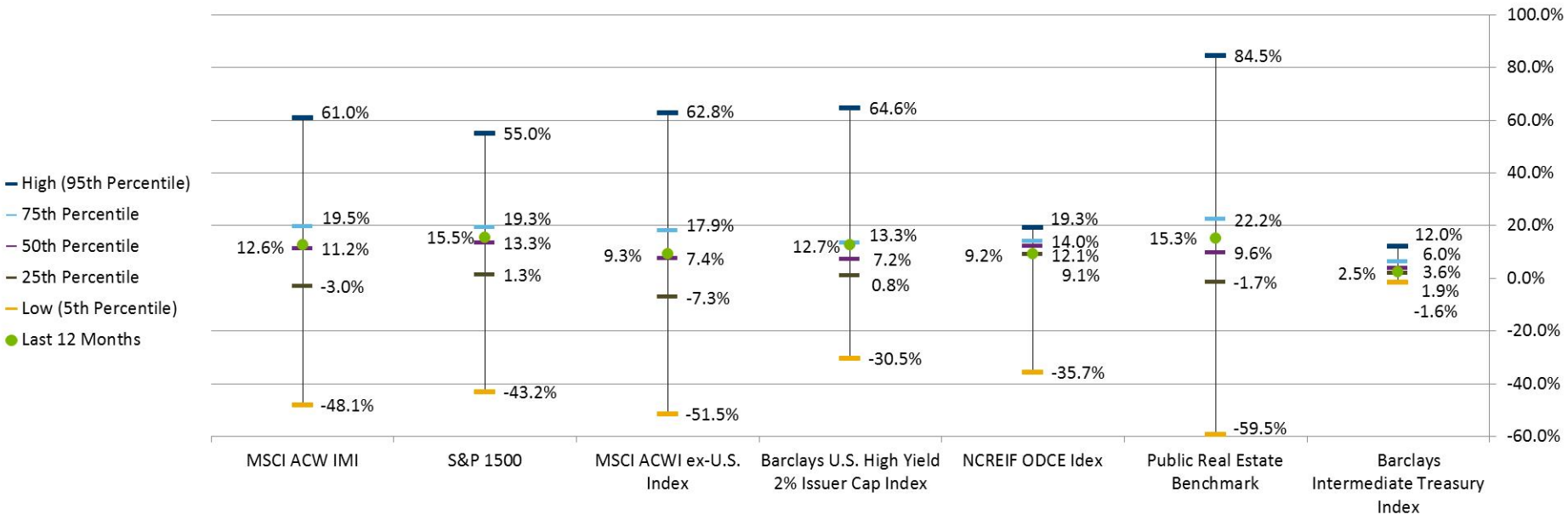
Rolling 12-Month Capital Market Returns (10 Years ending 9/30/16)



§ The chart above depicts the dispersion of rolling 12 month returns of various capital markets over the last 10 years.

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Recent Success of Active Investment Management

Percentage of Active Managers that Outperformed Benchmarks

Fund Category	Benchmark	1-Year	3-Year	5-Year	10-Year
All Multi-Cap Funds	S&P Composite 1500	8	14	5	10
All Large-Cap Funds	S&P 500	15	19	8	15
All Mid-Cap Funds	S&P Mid Cap 400	12	16	12	9
All Small-Cap Funds	S&P Small Cap 600	11	6	2	9
International Funds	S&P 700	45	45	40	20
Global Equity Funds	S&P Global 1200	25	23	18	19
Inter Gov't Bond Funds	Barclays Int Government	36	41	29	20
High Yield Bond Funds	Barclays High Yield	25	20	11	3

Source: S&P Index Versus Active (SPIVA) Scorecard: Mid-Year June 2016

- S&P analyzes performance of mutual funds based on the Lipper database
  - Free from survivorship bias
  - Appropriate comparison of funds to relevant style / capitalization benchmark
- Data depicts the difficulty associated with adding value net of investment management fees
  - Over ten years the benchmark would be in the top quartile of each category
  - Over recent periods international equity and intermediate government bonds have been areas where active management has been able to add value

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Summary Analysis

- Public equity underperformance has been the largest detractor from Total Fund results during the trailing 12 month period.
  - Public equity accounted for 129 bps of Total Fund underperformance (-205 bps).
  - U.S. equity contributed 74 bps of public equity underperformance.
  - Over the trailing 12 months ending June 2016, the S&P 1500 outperformed 92% of the managers in the active management universe (SPIVA® U.S. Scorecard).

- Actual allocations were in line with policy at the end of the period.

- Longer term investment results have been generally positive, the Total Fund has produced risk adjusted returns superior to the benchmark and the Long Term Public Benchmark over the five and ten year period.
  - The Total Fund underperformed the benchmark in nominal terms by 0.1% over the trailing five year period.

- The Total Fund has meaningfully outperformed the Long Term Public Benchmark over most longer-term periods.

- Diversification has been effective, the Total Fund Policy Benchmark has produced a return superior to the Long Term Public Benchmark at a meaningfully lower level of risk (volatility) over the trailing five and ten year period.

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Questions?

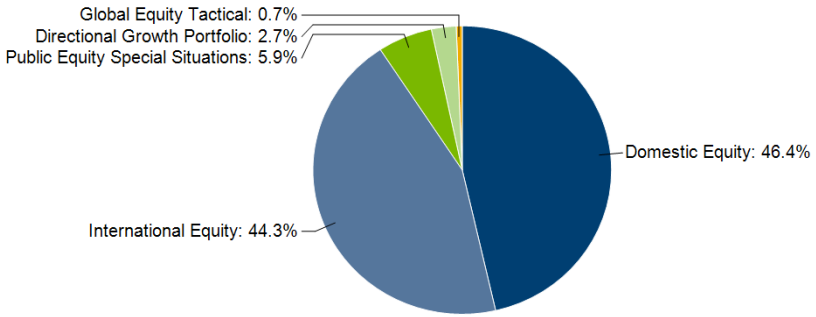
Appendix

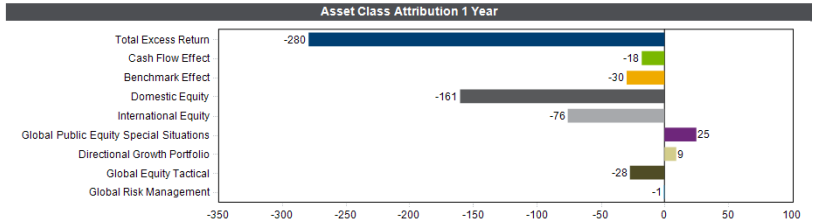
Empower Results®

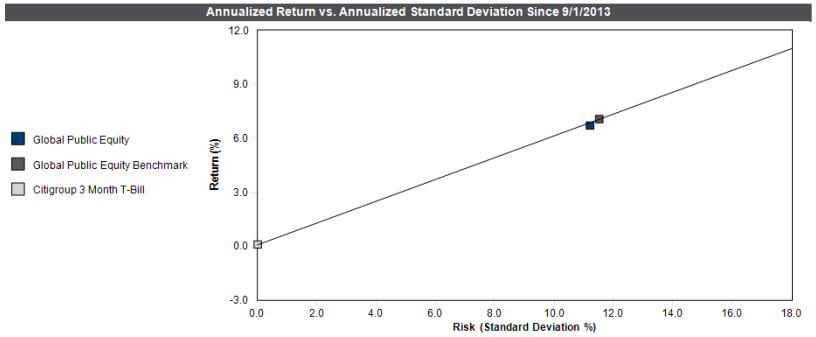
Return Seeking
Global Public Equity Performance

	Allocation			Performance(%)				
	Market Value ($)	%	Policy(%)	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years
Global Public Equity	12,196,051,481	47.7	47.6	5.2	4.8	0.5	9.8	5.1
Global Public Equity Benchmark				*5.7*	*7.3*	*0.8*	*12.6*	*5.5*

Global Public Equity Asset Allocation







[1] Source data can be found on pages 42, 43, and 44 of full report.
[2] While the Special Situations, Directional Growth, and Global Equity Tactical component's underlying managers may have domestic or international equity benchmarks, the components are not included in the attribution for domestic and international equity

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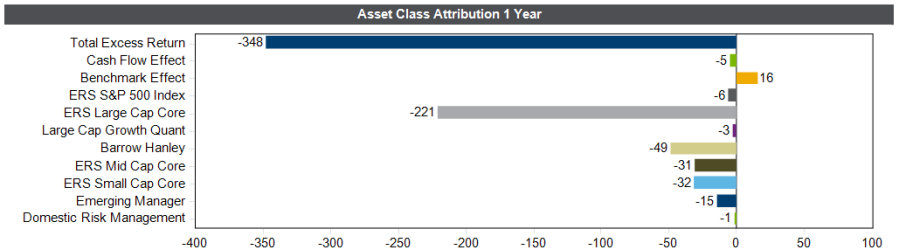
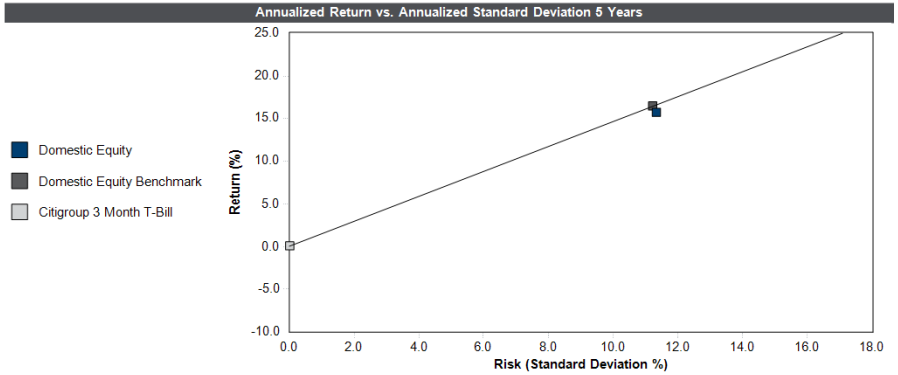
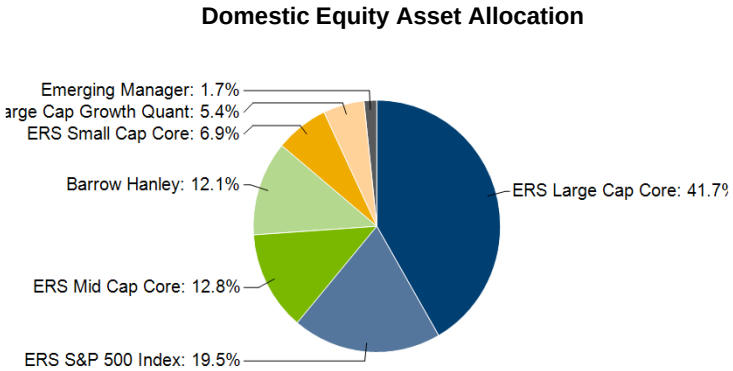
Return Seeking (Global Equity)
Domestic Equity Performance

	Allocation		Performance(%)						
	Market Value ($)	%	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years	5 Years	10 Years
Domestic Equity	5,659,752,230	22.1	3.8	6.2	0.0	12.0	9.7	15.7	7.0
Domestic Equity Benchmark			*4.0*	*8.3*	*0.0*	*15.5*	*10.9*	*16.4*	*7.3*







[1] Source data can be found on pages 46, 47, and 48 of full report.

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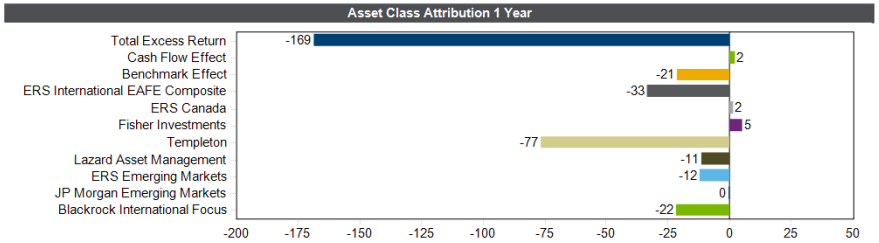
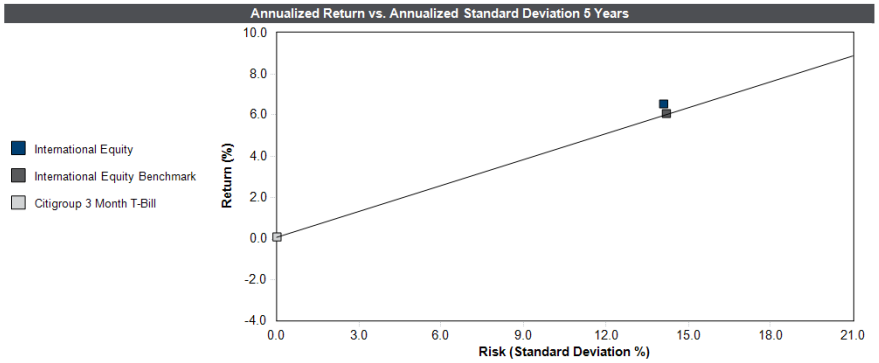
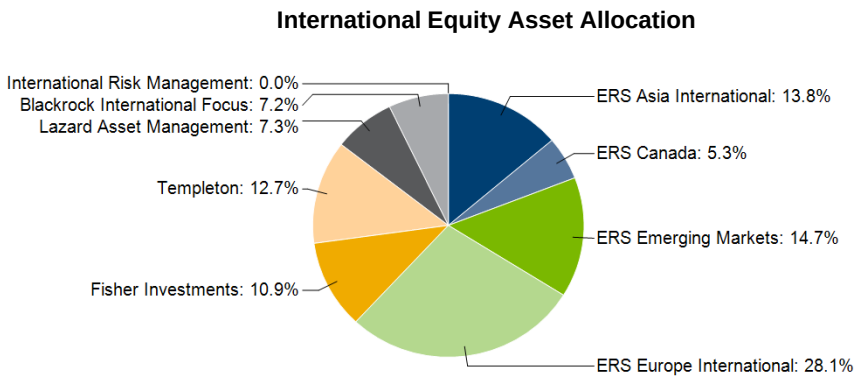
Return Seeking (Global Equity)
International Equity Performance

	Allocation		Performance(%)						
	Market Value ($)	%	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years	5 Years	10 Years
International Equity	5,408,288,331	21.2	7.1	3.6	1.1	7.6	0.1	6.5	2.2
International Equity Benchmark			*6.9*	*5.8*	*1.2*	*9.3*	*0.2*	*6.0*	*1.6*







[1] Source data can be found on pages 50, 51, and 52 of full report.

Empower Results®

Return Seeking (Global Equity)
Private Equity Summary

	Allocation			Internal Rate of Return(%)			
	Market Value ($)	%	Policy(%)	1 Year	3 Years	5 Years	Since Inception
Private Equity	2,630,834,748	10.3	10.0	6.0	11.0	12.2	10.8

Private Equity Program Summary by Fiscal Year as of 9/30/2016

ERS FY	# of Deals	Capital Committed	Capital Called	Distributions	Market Value
1999	1	$100,000,000	-$88,405,114	$129,578,992	$0
2007	1	$60,585,106	-$57,227,107	$114,604,489	$315,091
2008	3	$196,960,000	-$231,442,502	$295,470,705	$74,992,558
2009	12	$909,670,400	-$997,756,852	$1,032,882,457	$371,444,576
2010	7	$455,820,000	-$475,594,573	$427,214,928	$164,657,171
2011	9	$649,200,000	-$597,275,323	$275,944,610	$422,233,260
2012	7	$501,773,006	-$378,937,847	$173,396,857	$370,670,034
2013	7	$437,532,419	-$314,014,651	$89,139,336	$250,050,698
2014	13	$1,191,681,539	-$613,398,110	$44,674,433	$607,616,981
2015	11	$934,485,000	-$247,037,781	$53,549,306	$226,736,291
2016	9	$743,180,176	-$138,872,292	$230,543	$142,118,088
2017	1	$25,000,000	$0	$0	$0
Grand Total	**81**	**$6,205,887,646**	**$4,139,962,154**	**$2,636,686,657**	**$2,630,834,748**

[1] Source data can be found on page 54 of full report.
[2] Total portfolio market value includes FX contracts and STIF balance
[3] Internal Rate of Return figures include market value adjustments made after September 30, 2016.

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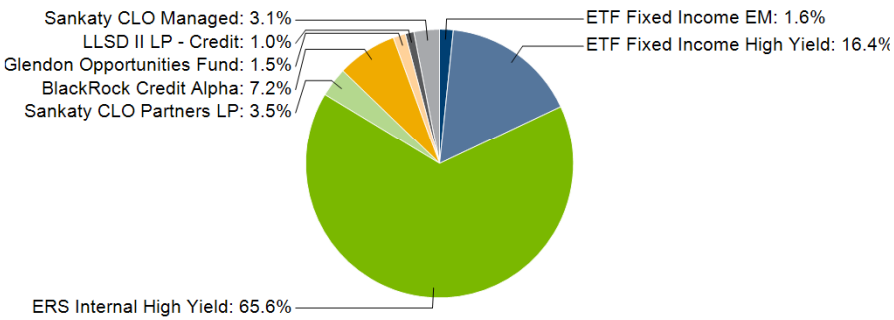
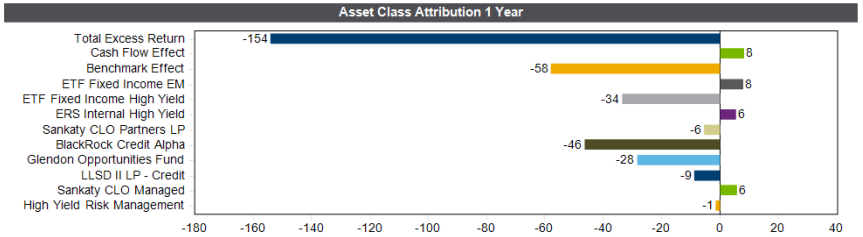
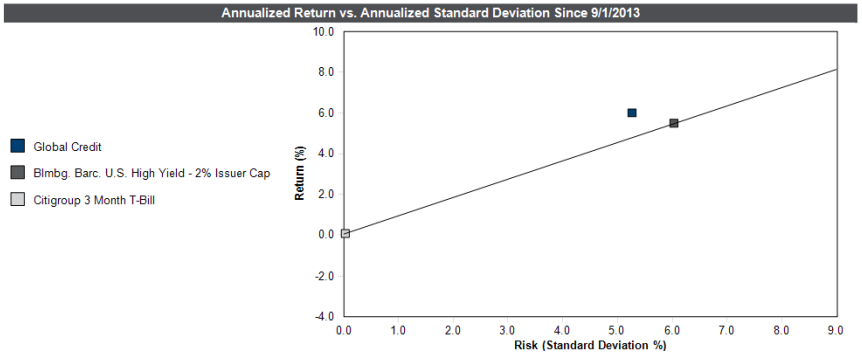
Return Seeking
Global Credit Performance

	Allocation			Performance(%)				
	Market Value ($)	%	Policy(%)	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years
Total Global Credit	2,029,209,501	7.9	8.0	5.5	13.1	0.9	11.2	5.6
Barclays U.S. High Yield - 2% Issuer Cap				*5.6*	*15.1*	*0.7*	*12.7*	*5.3*

Global Credit Asset Allocation







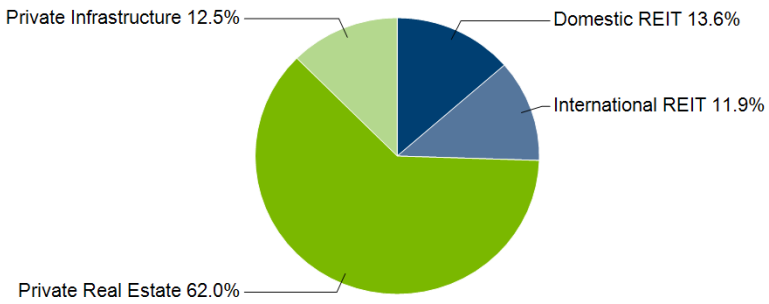
[1] Source data can be found on page 58, 59, and 60 of full report.
[2] During the second quarter of 2016 Barclays changed pricing sources for the Barclays U.S. High Yield 2% Issuer Cap (the primary benchmark for the Total Global Credit component), the source change resulted in a 0.13% increase in the return relative to the legacy pricing source.

AON Empower Results®

Return Seeking
Total Real Assets Asset Class Performance

	Allocation			Performance(%)					
	Market Value ($)	%	Policy(%)	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years	5 Years
Total Real Assets	2,791,939,559	10.9	11.4	2.7	6.2	0.2	9.6	9.6	11.9
Real Estate	2,443,272,845	9.6	-	2.3	9.1	0.2	12.9	11.0	12.6

Total Real Assets Asset Allocation



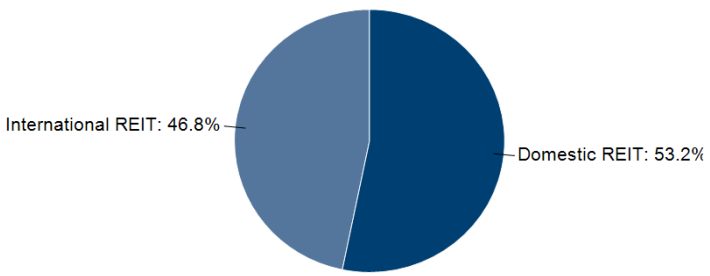
[1] Source data can be found on page 35 and 62 of full report.

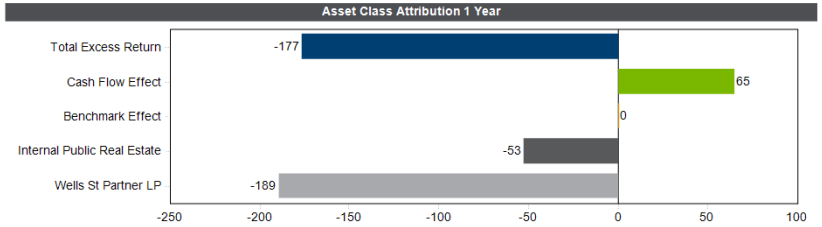
Empower Results®

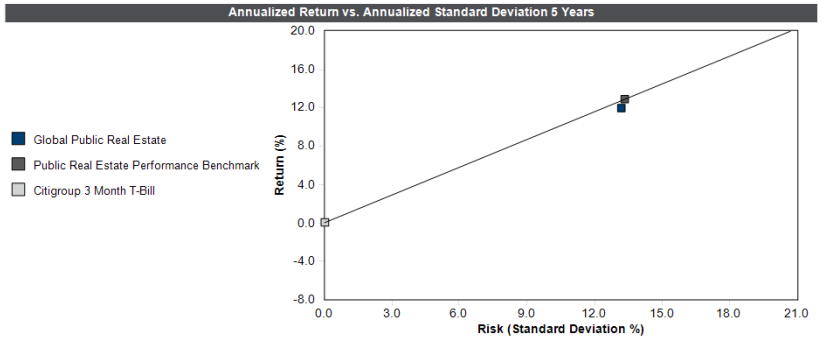
Return Seeking (Real Assets)
Real Estate Portfolio Performance

	Allocation		Performance(%)					
	Market Value ($)	%	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years	5 Years
Global Public Real Estate	712,182,733	2.8	0.8	9.2	-1.2	13.5	6.8	11.9
Public Real Estate Performance Benchmark			*1.4*	*10.3*	*-0.9*	*15.3*	*8.2*	*12.9*

Global Public Real Estate Asset Allocation







[1] Source data can be found on pages 64 and 65 of the full report.

Empower Results®

Return Seeking (Real Assets)
Private Real Estate Summary

	Allocation		Internal Rate of Return(%)			
	Market Value ($)	%	1 Year	3 Years	5 Years	Since Inception
Private Real Estate	1,728,999,342	6.8	9.3	12.6	12.6	12.8

Private Real Estate Program Summary by Fiscal Year as of 9/30/2016

ERS FY	# of Deals	Capital Committed	Capital Called	Distributions	Market Value
2010	2	$136,300,000	$135,231,392	$54,153,694	$145,962,678
2011	7	$599,200,000	$623,145,384	$541,846,403	$411,488,291
2012	7	$495,200,000	$521,831,106	$318,878,508	$400,772,313
2013	5	$409,080,000	$331,808,437	$205,023,185	$218,236,083
2014	10	$492,640,000	$396,940,361	$112,291,074	$321,155,131
2015	8	$500,800,075	$195,139,350	$32,536,871	$174,741,173
2016	6	$245,000,000	$69,406,232	$9,508,048	$56,643,673
Total	**45**	**$2,878,220,075**	**$2,273,502,262**	**$1,274,237,784**	**$1,728,999,342**

[1] Source data can be found on page 66 of the full report.

AON Empower Results®

Return Seeking (Real Assets)
Private Infrastructure Summary

	Allocation		Internal Rate of Return(%)		
	Market Value ($)	%	1 Year	3 Year	Since Inception
Private Infrastructure	348,666,715	1.4	-14.7	-5.0	-0.7

Private Infrastructure Program Summary by Fiscal Year as of 9/30/2016

ERS FY	# of Deals	Capital Committed	Capital Called	Distributions	Market Value
2012	1	$70,000,000	$70,000,000	$0	$53,023,000
2013	2	$205,000,000	$148,239,920	$3,297,944	$156,957,730
2015	2	$105,000,000	$57,435,598	$10,675,346	$42,810,566
2016	2	$177,100,000	$100,763,287	$8,046,027	$95,875,419
2017	1	$100,000,000	$0	$0	$0
Total	**8**	**$657,100,000**	**$376,438,805**	**$22,019,317**	**$348,666,715**

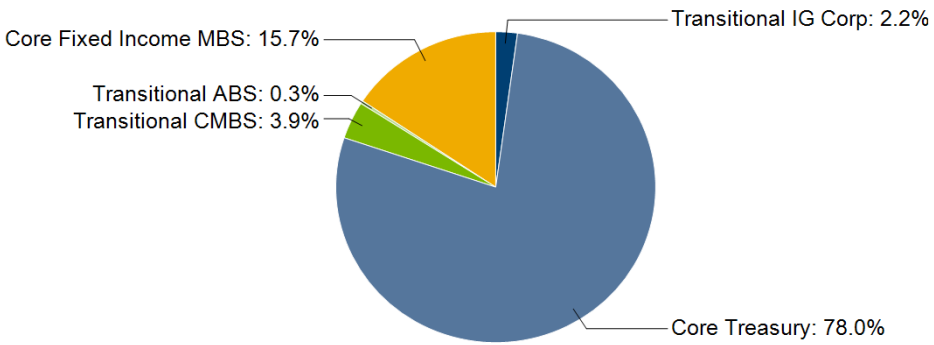
[1] Source data can be found on page 69 of the full report.
[2] The Market Values above do not include adjustments between September 30, 2016 and the preparation date of this report.
[3] The IRRs above include all adjustments effective September 30, 2016 that were received from the general partners by the time this report was prepared.

AON Empower Results®

Risk Reduction
Rates Asset Class Performance

	Allocation			Performance(%)			
	Market Value ($)	%	Policy(%)	1 Quarter	Year To Date	Fiscal YTD	1 Year
Total Rates	4,079,152,712	16.0	17.0	-0.1	3.6	0.2	2.8
Barclays U.S. Treasury Float Adjusted: Intermediate				*-0.3*	*3.4*	*0.2*	*2.5*

Total Rates Asset Allocation



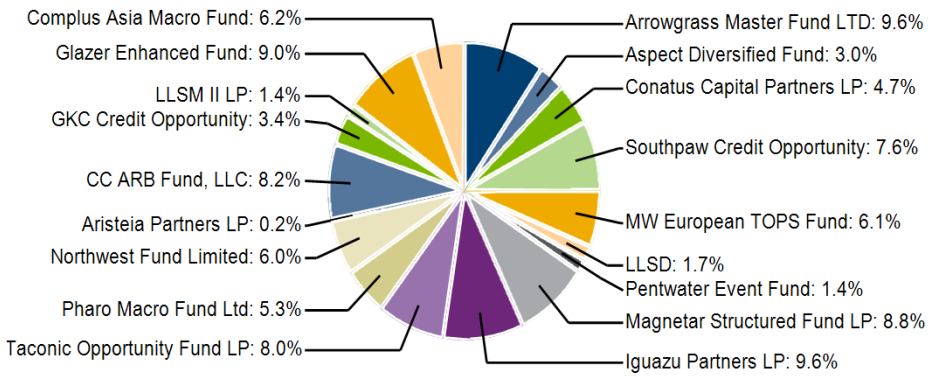
[1] Source data can be found on page 72 of full report.

Empower Results®

Risk Reduction
Absolute Return Portfolio Performance

	Allocation			Performance(%)			
	Market Value ($)	%	Policy(%)	1 Quarter	Year To Date	Fiscal YTD	1 Year
Absolute Return	1,289,182,114	5.0	5.0	3.0	4.2	2.1	4.3
90 Day Tbill + 4%				*1.1*	*3.2*	*0.3*	*4.2*

Absolute Return Asset Allocation



[1] Source data can be found on page 76 of the full report.

Empower Results®

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Total Fund

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What Batting Average Should Investors Expect from Active Managers?

To clients of Aon Hewitt Investment Consulting:

In professional baseball, a player who gets a hit in three out of every ten at-bats is considered great, despite the fact that this implies failing more often than not. More broadly, skilled people sometimes fail in nearly every challenging endeavor, and investing is no different.

It can be insightful to consider what is a reasonable batting average to expect from an active manager, and we can explore this topic with a simple formula. For a certain investment manager, if we believe the manager is skilled, then we'll assume that it is expected to add 1% return over the benchmark; alternatively, if we believe the manager is average, then we'll assume it is expected to lag the benchmark by 1% (net of fees and trading costs). But expected performance is never guaranteed, so let's also assume 4% risk around these expected results. The table below shows the likelihood of outperforming over different horizons:

Horizon (years)	Likelihood of Outperforming (skilled)	Likelihood of Outperforming (average)
1	60%	40%
3	67%	33%
10	79%	21%
44	95%	5%

Investors can glean very useful insight from this simple analysis:

- Active management is not easy. Even skilled managers have batting averages that are only slightly above 0.500.
- Past performance is a noisy filter for crafting expectations about future performance. Skilled managers can underperform, and average managers can outperform.
- The common practice of relying heavily on three-year performance in hiring and firing managers will likely lead to poor decisions.

Running an active portfolio allows the possibility of improving results, but it is a difficult endeavor. It is critical to establish reasonable expectations and be thoughtful about incorporating both qualitative and quantitative methods for evaluating managers, as simplistic approaches based purely on historical performance are likely to lead to mistakes.

Aon Hewitt Investment Consulting

[1] Assume risk is measured as the annual tracking error relative to the benchmark.

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Market Highlights

A strong quarter for equity markets, with Emerging Markets and Japan leading the way.
The result of the UK's EU referendum and the resultant sharp downgrade to monetary policy expectations, not just in the UK but across the developed world, boosted equity returns. Over the quarter the MSCI All Country World IMI returned 5.7%. U.S. equities (S&P 1500) returned 4.0% over the quarter. The MSCI Emerging Market Index (9.0%), MSCI Japan (8.5%) and MSCI Australia (8.3%) were the strongest performers as a delay to Fed rates hikes and a weaker U.S. dollar supported sentiment in these markets. In a quarter of strong equity markets, the smallest gains were seen in the U.S. (4.0%) and the UK (4.5%). Trailing 1-year global equity returns (MSCI ACW IMI) were 12.6%. U.S. equities returned a strong 15.5% over the trailing 1-year period.

U.S. economic growth picture mixed over the summer
There have been clear indications since the start of the year that U.S. economic growth momentum has slowed compared with 2015, and the mixed third quarter dataflow did not alter this trend. The closely watched ISM index of manufacturing sector activity dipped to 49.4, indicating mild contraction, for the first time since February, before rebounding in September to 51.5. The average reading since the start of 2015 has been a meagre 51, which shows that growth has been moderate at best. The average ISM reading in 2013 and 2014 was 54.7. The labor market disappointed expectations in the latest (August) reading, with 151k jobs added to non-farm payrolls and the unemployment rate unchanged at 4.9%. The latest reading on consumer confidence was the highest for almost a decade, with respondents to the survey citing optimism about employment conditions in the short term.

The Federal Reserve hits the pause button
Weaker economic data reduced the likelihood of the Fed's rate hike plans but the result of the UK's EU Referendum increased global risk aversion sharply in the subsequent days and prompted the Fed to delay rate hikes. Interest rates were not changed throughout the quarter but the commentary by various Fed officials gradually lost its dovish tone, as it became clear that the initial reaction to the referendum was overblown. This culminated in the September meeting in which the statement accompanying the announcement of unchanged interest rates indicated that a rate increase was a distinct possibility in December.

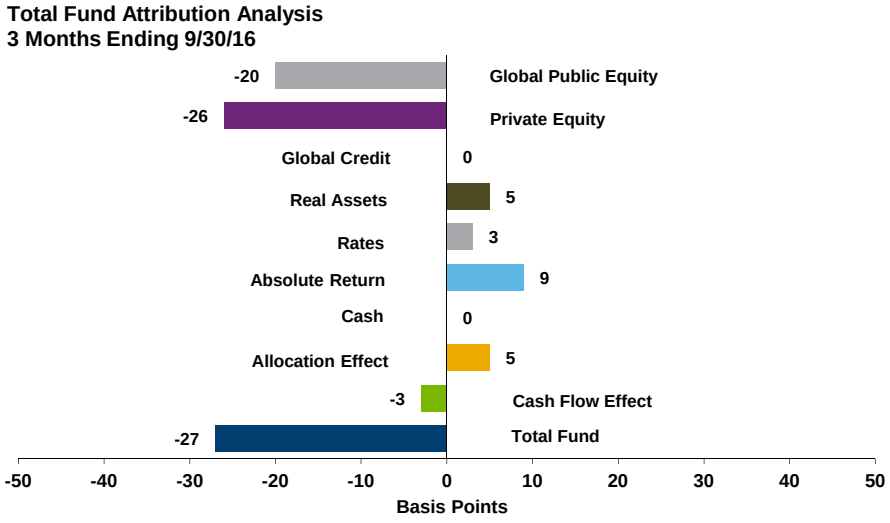
European growth remained moderate
There was little to report in terms of the Eurozone economy over the third quarter. Second quarter growth was reported to have slowed to 0.3% from the previous quarter's 0.5%, but the forward looking purchasing managers' index hit a 3 month high in September (at 52.6) while the unemployment rate, while still a high 10.1%, maintained a 5-year low level. Overall, the economy is growing moderately but with little sign of a return to sustained strength. The European Central Bank (ECB) decided to keep its accommodative monetary policy unchanged over the quarter. The ECB has been buying €80bn of bonds per month while keeping the bank deposit rate negative for most of this year but inflation remains low, rising to 0.4% in September.

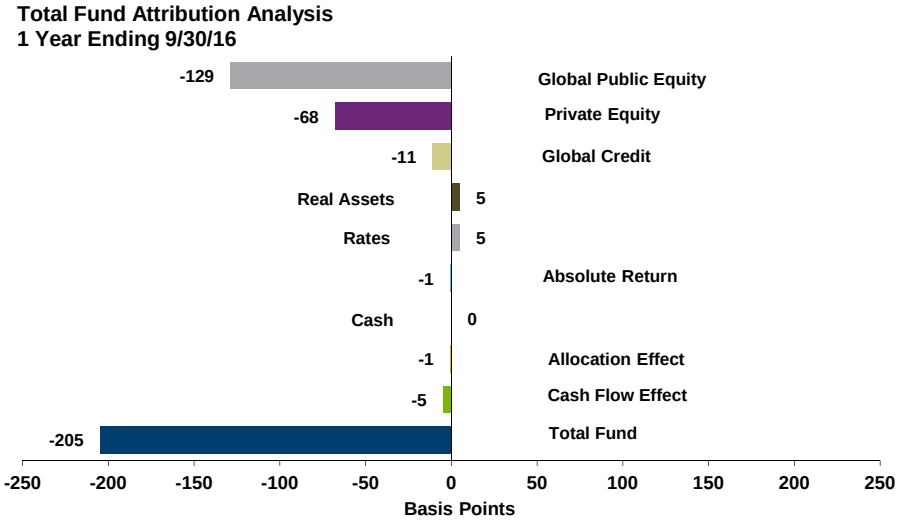
Emerging markets benefit from global easing
Emerging market economies have performed better this year as the price of oil has stabilized, China has introduced fresh stimulus measures and U.S. monetary policy tightening has been gradual. These factors remained broadly in place in the third quarter, apart from a small decline in the oil price. The broad commodity index (S&P GSCI Commodity Index) fell 4.2% over the quarter, as Energy (S&P GSCI Energy) weighed on performance, falling by 2.7%. Industrial metals prices (S&P GSCI Industrial Metals) rallied by 3.7%, boosted by Chinese stimulus and imports.

Yields rebound from all-time lows
10 year U.S. Treasury yields fell in mid-July to an all-time low of 1.38% following the risk aversion triggered by the UK referendum result. As worries have eased yields began to rise, with the 10 year yield finishing the quarter at a still historically low 1.62%. The Barclays 30 Year Treasury Index returned -2.0%, while the Barclays Intermediate Treasury Index returned -0.3%. In the corporate sector, high yield outperformed investment grade credit, returning 5.6% (Barclays High Yield Index), versus 1.2% for investment grade credit (Barclays Credit Index).

AON Empower Results®

Attribution





Plan Performance

The attribution graphs above illustrate the Fund's performance by asset class during the quarter and one-year periods. The "Asset Class Effects" (Global Public Equity, Private Equity, Global Credit, Real Assets, Rates, Absolute Return, and Cash) are based on the weight of each asset class multiplied by the amount of its outperformance (or underperformance).

The bar labeled "Allocation Effect" represents the impact of actual allocation deviations from the policy targets on the Total Fund's relative performance.

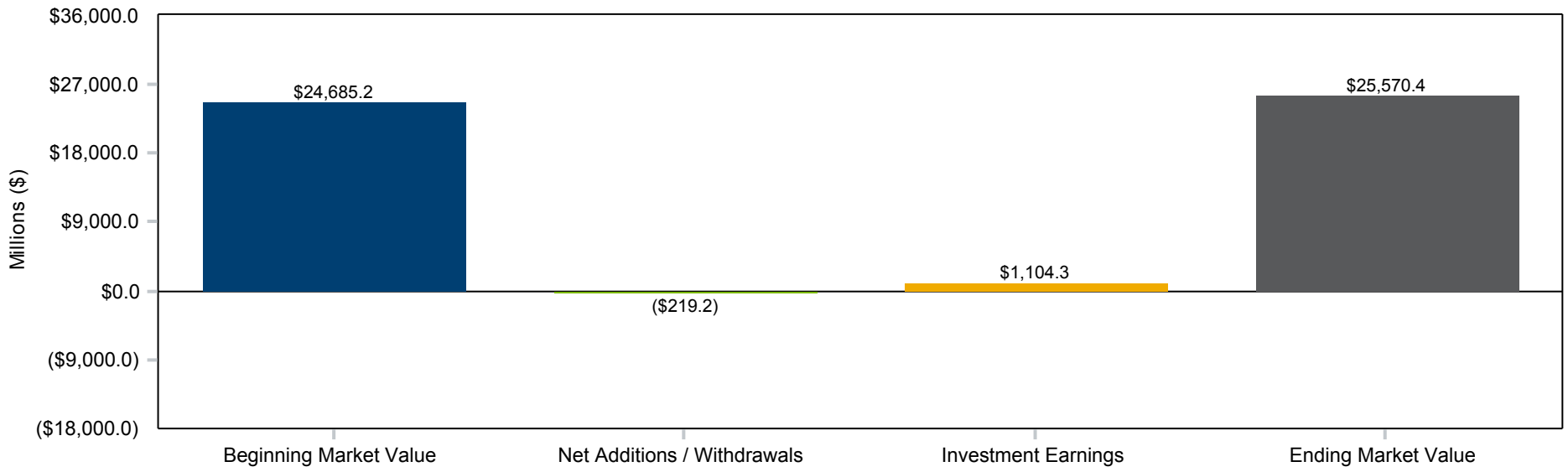
The bar labeled "Cash Flow Effect" illustrates the effects on the Fund's performance from the timing of cash contributions, withdrawals, and asset movements between accounts. Performance for the remainder of a month following a contribution will be magnified to reflect a larger allocation. The opposite is true for withdrawals, as performance will be diminished with a reduced allocation.

During the third quarter, the Total Fund underperformed the Total Fund Policy Benchmark by 27 bps. For the quarter, the global public equity and private equity components detracted from relative performance. The remaining asset classes were additive to relative performance during the period. The Total Fund underperformed the Total Fund Policy Benchmark by 205 basis points over the previous 1-year period.

AON Empower Results®

Total Plan Asset Summary

Change in Market Value
From July 1, 2016 to September 30, 2016



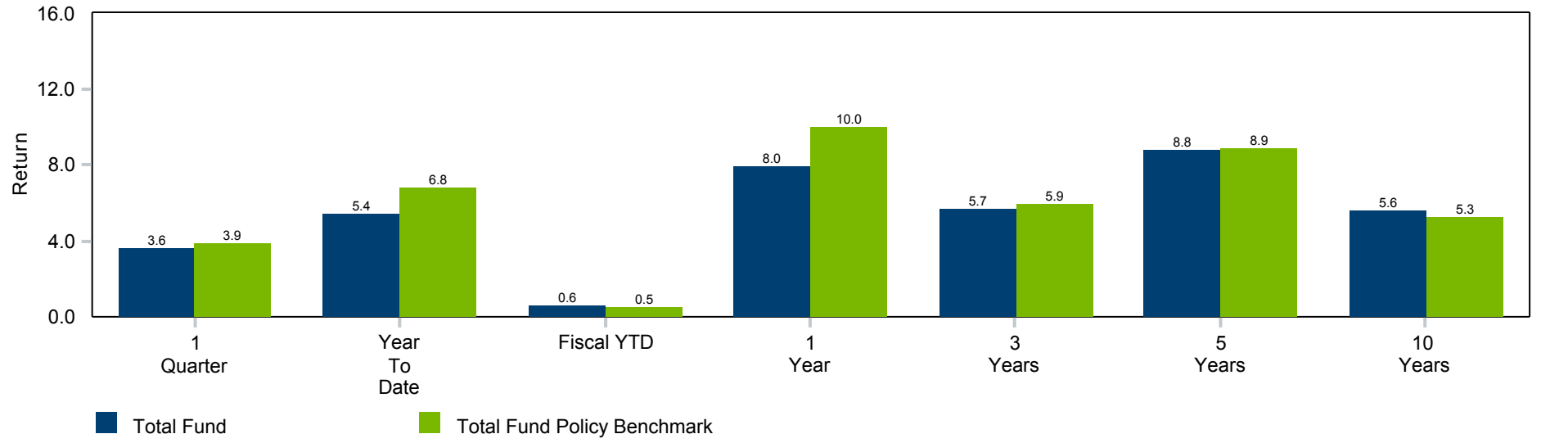
Summary of Cash Flow

	1 Quarter	Fiscal YTD	1 Year
Total Fund			
Beginning Market Value	24,685,204,418	25,499,105,144	24,533,633,307
+ Additions / Withdrawals	-219,154,046	-80,485,950	-893,842,755
+ Investment Earnings	1,104,336,602	151,767,780	1,930,596,422
= Ending Market Value	25,570,386,973	25,570,386,973	25,570,386,973

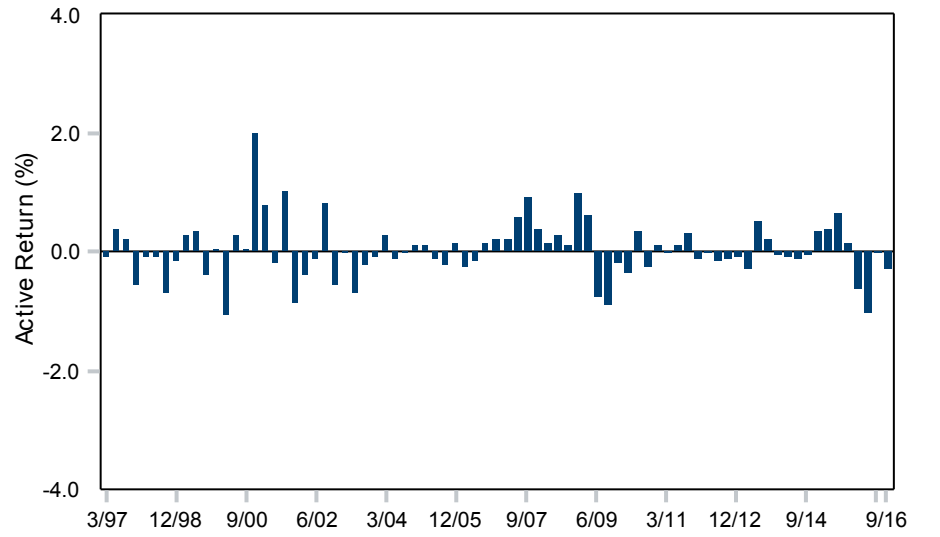
AON Empower Results®

Total Plan Performance Summary

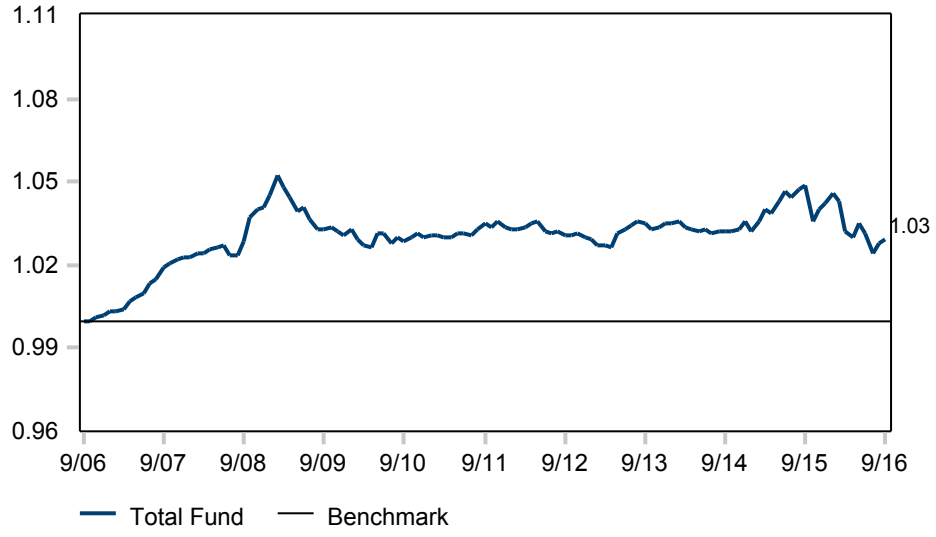
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - 10 Years



AON Empower Results®

As of September 30, 2016

Asset Allocation & Performance

	Allocation		Performance(%)						
	Market Value ($)	%	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years	5 Years	10 Years
Total Fund	25,570,386,973	100.0	3.6	5.4	0.6	8.0	5.7	8.8	5.6
Total Fund Policy Benchmark			3.9	6.8	0.5	10.0	5.9	8.9	5.3
Return Seeking	19,751,090,372	77.2	4.6	6.0	0.6	9.6	6.6	10.9	-
Global Public Equity	12,196,051,481	47.7	5.2	4.8	0.5	9.8	5.1	-	-
Global Public Equity Benchmark			5.7	7.3	0.8	12.6	5.5	-	-
Domestic Equity	5,659,752,230	22.1	3.8	6.2	0.0	12.0	9.7	15.7	7.0
Domestic Equity Benchmark			4.0	8.3	0.0	15.5	10.9	16.4	7.3
ERS S&P 500 Index Fund	1,101,301,751	4.3	3.8	7.6	0.0	15.1	11.1	16.3	7.3
S&P 500 Index			3.9	7.8	0.0	15.4	11.2	16.4	7.2
ERS Large Cap Core	2,357,999,192	9.2	3.2	4.3	0.0	10.3	9.5	15.5	7.2
S&P 500 Index			3.9	7.8	0.0	15.4	11.2	16.4	7.2
Large Cap Growth Quant	302,916,740	1.2	3.9	6.0	0.3	14.1	13.4	-	-
S&P 500 Growth			4.8	6.4	0.4	14.7	12.8	-	-
Barrow Hanley Mewhinney & Strauss	686,523,365	2.7	4.5	6.3	-0.6	11.6	8.9	15.8	-
S&P 500 Value			2.9	9.4	-0.4	16.0	9.3	15.9	-
ERS Mid Cap Core	723,763,294	2.8	4.1	9.6	-0.3	12.7	8.1	16.3	-
S&P MidCap 400			4.1	12.4	-0.6	15.3	9.4	16.5	-
ERS Small Cap Core	392,407,394	1.5	6.1	9.1	0.9	13.0	8.3	16.8	8.5
S&P SmallCap 600			7.2	13.9	0.6	18.1	9.0	17.9	8.7
Emerging Manager Composite	94,840,495	0.4	4.0	4.5	-0.1	10.1	7.7	14.9	-
S&P Composite 1500			4.0	8.3	0.0	15.5	10.9	16.4	-
International Equity	5,408,288,331	21.2	7.1	3.6	1.1	7.6	0.1	6.5	2.2
International Equity Benchmark			6.9	5.8	1.2	9.3	0.2	6.0	1.6
ERS International EAFE Composite	2,266,411,222	8.9	6.3	0.7	1.2	5.7	0.2	7.5	2.4
MSCI EAFE Index (Net)			6.4	1.7	1.2	6.5	0.5	7.4	1.8
ERS Canada	285,870,630	1.1	4.8	21.0	1.2	14.8	-0.4	3.4	-
MSCI Canada (Net)			4.8	20.6	1.1	14.5	-1.2	2.4	-
Fisher Investments	588,350,059	2.3	8.6	4.3	0.9	9.7	1.8	7.9	3.8
Fisher Performance Benchmark			6.9	5.8	1.2	9.3	0.2	6.0	1.7

AON Empower Results®

Asset Allocation & Performance

	Allocation		Performance(%)						
	Market Value ($)	%	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years	5 Years	10 Years
Templeton	686,348,772	2.7	7.1	0.7	1.0	3.8	-0.5	7.5	2.4
Templeton Performance Benchmark			6.9	5.8	1.2	9.3	0.2	6.0	1.7
Lazard Asset Management	396,305,785	1.5	2.5	0.0	1.0	4.7	1.8	-	-
MSCI EAFE Index (Net)			6.4	1.7	1.2	6.5	0.5	-	-
Blackrock International Focus	387,365,111	1.5	7.9	1.3	0.6	6.2	-	-	-
MSCI AC World ex USA Index (Net)			6.9	5.8	1.2	9.3	-	-	-
ERS Emerging Markets	797,636,747	3.1	9.1	13.9	1.6	15.8	0.6	3.7	-
MSCI EM (Net)			9.0	16.0	1.3	16.8	-0.6	3.0	-
International Risk Management	5	0.0							
Global Public Equity Special Situations	722,294,959	2.8	6.6	10.8	0.3	17.8	-	-	-
Directional Growth Portfolio	326,246,048	1.3	3.7	3.7	1.1	10.8	-	-	-
Global Equity Tactical	79,469,916	0.3	7.6	-5.1	-0.6	-0.6	-	-	-
Private Equity	2,635,953,128	10.3	3.2	6.8	1.3	7.1	12.6	11.9	-
Total Global Credit	2,029,209,501	7.9	5.5	13.1	0.9	11.2	5.6	-	-
Barclays U.S. High Yield 2% Issuer Cap			5.6	15.1	0.7	12.7	5.3	-	-
ETF Fixed Income Emerging Markets	33,416,655	0.1	3.1	14.6	0.4	16.8	9.9	-	-
ETF Fixed Income EM Performance Benchmark			5.6	15.1	0.7	12.7	5.3	-	-
ETF Fixed Income High Yield	331,970,548	1.3	4.5	12.8	1.1	11.3	4.8	-	-
Barclays U.S. High Yield 2% Issuer Cap			5.6	15.1	0.7	12.7	5.3	-	-
ERS Internal High Yield	1,331,529,007	5.2	5.4	14.1	0.7	12.8	7.1	-	-
Barclays U.S. High Yield 2% Issuer Cap			5.6	15.1	0.7	12.7	5.3	-	-
Private Credit	332,293,291	1.3	7.4	9.4	1.5	4.2	-	-	-
Barclays U.S. High Yield 2% Issuer Cap (1 month lag)			5.8	11.5	2.1	9.1	-	-	-

AON Empower Results®

As of September 30, 2016

Asset Allocation & Performance

	Allocation		Performance(%)						
	Market Value ($)	%	1 Quarter	Year To Date	Fiscal YTD	1 Year	3 Years	5 Years	10 Years
Total Real Assets	2,791,939,559	10.9	2.7	6.2	0.2	9.6	9.6	11.9	-
Real Estate	2,443,272,845	9.6	2.3	9.1	0.2	12.9	11.0	12.6	4.3
Global Public Real Estate	712,182,733	2.8	0.8	9.2	-1.2	13.5	6.8	11.9	3.1
Public Real Estate Performance Benchmark			1.4	10.3	-0.9	15.3	8.2	12.9	2.9
Internal Public Real Estate	712,182,733	2.8	0.8	10.0	-1.2	15.0	8.4	13.0	3.6
Internal Public Real Estate Performance Benchmark			1.4	10.7	-0.9	15.5	8.4	13.0	2.9
Domestic REIT	379,063,125	1.5	-2.1	10.1	-2.3	18.5	14.1	15.8	6.7
Domestic Real Estate Performance Benchmark			-0.8	11.4	-1.8	19.6	14.1	15.8	5.9
International REIT	333,119,608	1.3	4.4	9.6	0.1	10.8	2.8	10.1	-
FTSE EPRA/NAREIT Global ex-U.S. Index			4.3	10.4	0.2	11.7	3.2	10.4	-
Private Real Estate	1,731,090,111	6.8	2.9	9.2	0.8	12.8	13.2	12.2	-
Private Real Estate Performance Benchmark			1.9	7.1	0.0	10.8	9.2	-	-
Total Infrastructure	348,666,715	1.4	5.1	-16.5	0.0	-16.3	-1.9	-	-
Private Infrastructure	348,666,715	1.4	5.1	-16.5	0.0	-16.3	-2.9	-	-
Special Situations	97,936,703	0.4	-2.1	-	-3.9	-	-	-	-
Risk Reduction	5,819,296,601	22.8	0.5	3.4	0.6	2.9	2.7	2.1	-
Total Rates	4,079,152,712	16.0	-0.1	3.6	0.2	2.8	2.5	-	-
Barclays U.S. Treasury Float Adjusted: Intermediate			-0.3	3.4	0.2	2.5	2.2	-	-
Absolute Return	1,289,182,114	5.0	3.0	4.2	2.1	4.3	4.8	-	-
91 Day T-Bill + 4% (1 month lag)			1.1	3.2	0.3	4.2	4.1	-	-
Total Cash	450,961,775	1.8							

* Please see Appendix for benchmark descriptions

AON Empower Results®

As of September 30, 2016

Asset Allocation & Performance

	Allocation		Performance(%)												
	Market Value ($)	%	Fiscal 2016	Fiscal 2015	Fiscal 2014	Fiscal 2013	Fiscal 2012	Fiscal 2011	Fiscal 2010	Fiscal 2009	Fiscal 2008	Fiscal 2007	Fiscal 2006	Fiscal 2005	Fiscal 2004
Total Fund	25,570,386,973	100.0	5.3	0.4	14.6	9.9	8.0	12.4	6.5	-6.7	-4.7	13.8	8.8	12.6	11.6
Total Fund Policy Benchmark			7.2	-1.0	15.0	9.5	8.1	12.0	6.8	-7.5	-5.5	12.1	9.0	12.5	11.8
Return Seeking	19,751,090,372	77.2	6.0	-0.2	18.1	12.7	9.3	-	-	-	-	-	-	-	-
Global Public Equity	12,196,051,481	47.7	4.8	-3.5	20.0	-	-	-	-	-	-	-	-	-	-
Global Public Equity Benchmark			7.7	-6.3	21.4	-	-	-	-	-	-	-	-	-	-
Domestic Equity	5,659,752,230	22.1	8.4	1.5	24.2	19.2	17.5	19.6	5.9	-18.4	-11.6	14.9	8.3	15.2	11.2
Domestic Equity Benchmark			12.5	0.5	24.9	19.4	17.5	19.1	5.6	-18.4	-11.1	15.1	8.9	12.6	11.5
ERS S&P 500 Index Fund	1,101,301,751	4.3	12.3	0.5	25.2	18.8	18.0	18.6	4.8	-17.8	-10.8	15.1	9.2	12.8	11.5
S&P 500 Index			12.6	0.5	25.2	18.7	18.0	18.5	4.9	-18.3	-11.1	15.1	8.9	12.6	11.5
ERS Large Cap Core	2,357,999,192	9.2	6.8	0.7	26.2	18.9	18.3	18.6	6.4	-17.7	-10.0	15.3	10.4	12.7	10.2
S&P 500 Index			12.6	0.5	25.2	18.7	18.0	18.5	4.9	-18.3	-11.1	15.1	8.9	12.6	11.5
Large Cap Growth Quant	302,916,740	1.2	10.8	5.7	28.7	-	-	-	-	-	-	-	-	-	-
S&P 500 Growth			11.8	3.9	27.5	-	-	-	-	-	-	-	-	-	-
Barrow Hanley Mewhinney & Strauss	686,523,365	2.7	8.4	1.0	21.8	24.7	16.1	-	-	-	-	-	-	-	-
S&P 500 Value			13.2	-3.3	22.8	22.9	17.3	-	-	-	-	-	-	-	-
ERS Mid Cap Core	723,763,294	2.8	7.8	0.8	23.3	25.9	12.3	21.5	13.9	-17.5	-	-	-	-	-
S&P MidCap 400			12.3	0.0	23.2	23.7	12.7	22.9	11.9	-18.2	-	-	-	-	-
ERS Small Cap Core	392,407,394	1.5	7.8	5.8	17.5	26.7	14.6	26.4	10.6	-20.8	-8.4	15.1	6.3	32.7	15.5
S&P SmallCap 600			13.3	1.8	18.7	26.7	16.9	24.4	7.8	-20.7	-6.2	14.3	7.1	26.5	14.8
Emerging Manager Composite	94,840,495	0.4	6.5	0.4	21.8	20.7	16.7	-	-	-	-	-	-	-	-
S&P Composite 1500			12.5	0.5	24.9	19.4	17.5	-	-	-	-	-	-	-	-
International Equity	5,408,288,331	21.2	1.3	-10.0	16.1	13.8	-0.1	11.8	2.2	-14.3	-12.3	19.5	20.8	23.5	21.3
International Equity Benchmark			2.9	-12.4	17.7	13.0	-1.9	10.3	2.9	-14.4	-14.4	18.7	24.3	23.6	22.6
ERS International EAFE Composite	2,266,411,222	8.9	-0.9	-6.3	14.5	18.3	2.0	11.1	-0.3	-14.3	-12.4	18.1	24.5	22.7	21.5
MSCI EAFE Index (Net)			-0.1	-7.5	16.4	18.7	0.0	10.0	-2.3	-14.9	-14.4	18.7	24.3	23.6	22.6
ERS Canada	285,870,630	1.1	8.3	-24.9	24.5	3.5	-4.5	17.4	-	-	-	-	-	-	-
MSCI Canada (Net)			7.9	-25.3	23.2	2.0	-5.7	17.0	-	-	-	-	-	-	-
Fisher Investments	588,350,059	2.3	4.4	-7.3	15.7	14.2	-2.4	17.8	4.2	-13.2	-10.5	18.8	-	-	-
Fisher Performance Benchmark			2.9	-12.4	17.7	13.0	-1.9	10.3	2.9	-13.8	-14.4	18.7	-	-	-

AON Empower Results®

As of September 30, 2016

Asset Allocation & Performance

	Allocation		Performance(%)												
	Market Value ($)	%	Fiscal 2016	Fiscal 2015	Fiscal 2014	Fiscal 2013	Fiscal 2012	Fiscal 2011	Fiscal 2010	Fiscal 2009	Fiscal 2008	Fiscal 2007	Fiscal 2006	Fiscal 2005	Fiscal 2004
Templeton	686,348,772	2.7	-2.6	-8.0	15.6	19.5	3.6	10.0	-0.7	-14.3	-15.1	25.2	22.5	25.4	21.5
Templeton Performance Benchmark			2.9	-12.4	17.7	13.0	-1.9	10.3	2.9	-13.8	-14.4	18.7	24.3	23.6	22.6
Lazard Asset Management	396,305,785	1.5	-1.6	-5.0	18.8	23.3	-	-	-	-	-	-	-	-	-
MSCI EAFE Index (Net)			-0.1	-7.5	16.4	18.7	-	-	-	-	-	-	-	-	-
Blackrock International Focus	387,365,111	1.5	-0.8	-	-	-	-	-	-	-	-	-	-	-	-
MSCI AC World ex USA Index (Net)			2.9	-	-	-	-	-	-	-	-	-	-	-	-
ERS Emerging Markets	797,636,747	3.1	10.9	-19.2	18.8	1.3	-7.0	9.6	19.9	-	-	-	-	-	-
MSCI EM (Net)			11.8	-22.9	20.0	0.5	-5.8	9.1	18.0	-	-	-	-	-	-
International Risk Management	5	0.0													
Global Public Equity Special Situations	722,294,959	2.8	12.2	-1.7	-	-	-	-	-	-	-	-	-	-	-
Directional Growth Portfolio	326,246,048	1.3	2.3	20.2	-	-	-	-	-	-	-	-	-	-	-
Global Equity Tactical	79,469,916	0.3	-5.4	-	-	-	-	-	-	-	-	-	-	-	-
Private Equity	2,635,953,128	10.3	5.8	11.0	20.8	17.1	2.3	14.7	-3.7	-23.6	-2.6	-	-	-	-
Total Global Credit	2,029,209,501	7.9	8.1	-1.4	11.2	-	-	-	-	-	-	-	-	-	-
Barclays U.S. High Yield 2% Issuer Cap			9.1	-2.9	10.6	-	-	-	-	-	-	-	-	-	-
ETF Fixed Income Emerging Markets	33,416,655	0.1	15.5	1.4	16.4	-7.5	-	-	-	-	-	-	-	-	-
ETF Fixed Income EM Performance Benchmark			9.1	-2.9	10.6	-2.8	-	-	-	-	-	-	-	-	-
ETF Fixed Income High Yield	331,970,548	1.3	6.9	-2.6	10.0	5.2	-	-	-	-	-	-	-	-	-
Barclays U.S. High Yield 2% Issuer Cap			9.1	-2.9	10.6	7.6	-	-	-	-	-	-	-	-	-
ERS Internal High Yield	1,331,529,007	5.2	9.8	-1.6	-	-	-	-	-	-	-	-	-	-	-
Barclays U.S. High Yield 2% Issuer Cap			9.1	-2.9	-	-	-	-	-	-	-	-	-	-	-
Private Credit	332,293,291	1.3	1.6	2.3	-	-	-	-	-	-	-	-	-	-	-
Barclays U.S. High Yield 2% Issuer Cap (1 month lag)			5.0	0.4	-	-	-	-	-	-	-	-	-	-	-

AON
Empower Results®

As of September 30, 2016

Asset Allocation & Performance

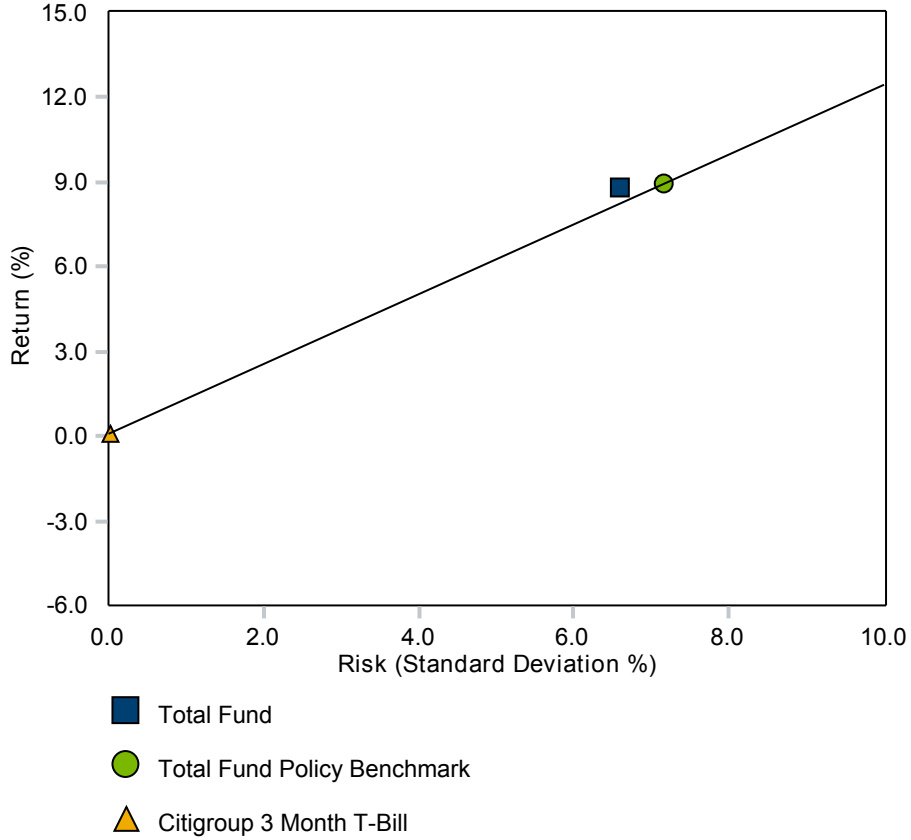
	Allocation		Performance(%)												
	Market Value ($)	%	Fiscal 2016	Fiscal 2015	Fiscal 2014	Fiscal 2013	Fiscal 2012	Fiscal 2011	Fiscal 2010	Fiscal 2009	Fiscal 2008	Fiscal 2007	Fiscal 2006	Fiscal 2005	Fiscal 2004
Total Real Assets	2,791,939,559	10.9	10.1	6.2	14.7	9.6	11.2	-	-	-	-	-	-	-	-
Real Estate	2,443,272,845	9.6	13.4	7.2	14.9	8.7	11.2	18.2	15.0	-22.0	-17.4	4.5	26.4	-	-
Global Public Real Estate	712,182,733	2.8	15.5	-5.6	19.6	6.5	12.6	15.0	15.4	-22.0	-17.4	4.5	26.4	-	-
Public Real Estate Performance Benchmark			16.8	-3.6	20.1	6.6	12.6	15.5	15.1	-23.1	-19.9	2.7	24.8	-	-
Internal Public Real Estate	712,182,733	2.8	18.2	-3.9	19.7	6.9	12.6	15.4	15.4	-22.0	-17.4	4.5	26.4	-	-
Internal Public Real Estate Performance Benchmark			18.0	-4.2	20.1	6.6	12.6	15.5	15.1	-23.1	-19.9	2.7	24.8	-	-
Domestic REIT	379,063,125	1.5	25.4	0.8	24.3	1.0	20.0	18.6	33.1	-33.0	-4.8	4.3	26.4	-	-
Domestic Real Estate Performance Benchmark			25.5	0.1	24.3	0.7	20.0	18.5	32.6	-33.8	-8.7	2.3	24.8	-	-
International REIT	333,119,608	1.3	10.4	-8.6	15.9	12.2	6.7	13.0	6.0	-14.0	-24.2	-	-	-	-
FTSE EPRA/NAREIT Global ex-U.S. Index			10.6	-8.1	16.6	12.0	6.8	13.2	5.7	-15.6	-24.8	-	-	-	-
Private Real Estate	1,731,090,111	6.8	12.8	14.1	12.5	10.1	10.7	13.0	-	-	-	-	-	-	-
Private Real Estate Performance Benchmark			10.8	13.4	4.0	4.1	-	-	-	-	-	-	-	-	-
Total Infrastructure	348,666,715	1.4	-16.3	0.7	12.0	17.9	-	-	-	-	-	-	-	-	-
Private Infrastructure	348,666,715	1.4	-16.3	0.3	9.0	17.9	-	-	-	-	-	-	-	-	-
Special Situations	97,936,703	0.4													
Risk Reduction	5,819,296,601	22.8	2.7	2.5	2.9	-1.0	3.0	-	-	-	-	-	-	-	-
Total Rates	4,079,152,712	16.0	3.3	2.1	2.5	-	-	-	-	-	-	-	-	-	-
Barclays U.S. Treasury Float Adjusted: Intermediate			3.1	1.9	2.2	-	-	-	-	-	-	-	-	-	-
Absolute Return	1,289,182,114	5.0	1.5	4.8	5.8	8.0	-	-	-	-	-	-	-	-	-
91 Day T-Bill + 4% (1 month lag)			4.2	4.0	4.0	4.1	-	-	-	-	-	-	-	-	-
Total Cash	450,961,775	1.8													

*Please see Appendix for benchmark descriptions

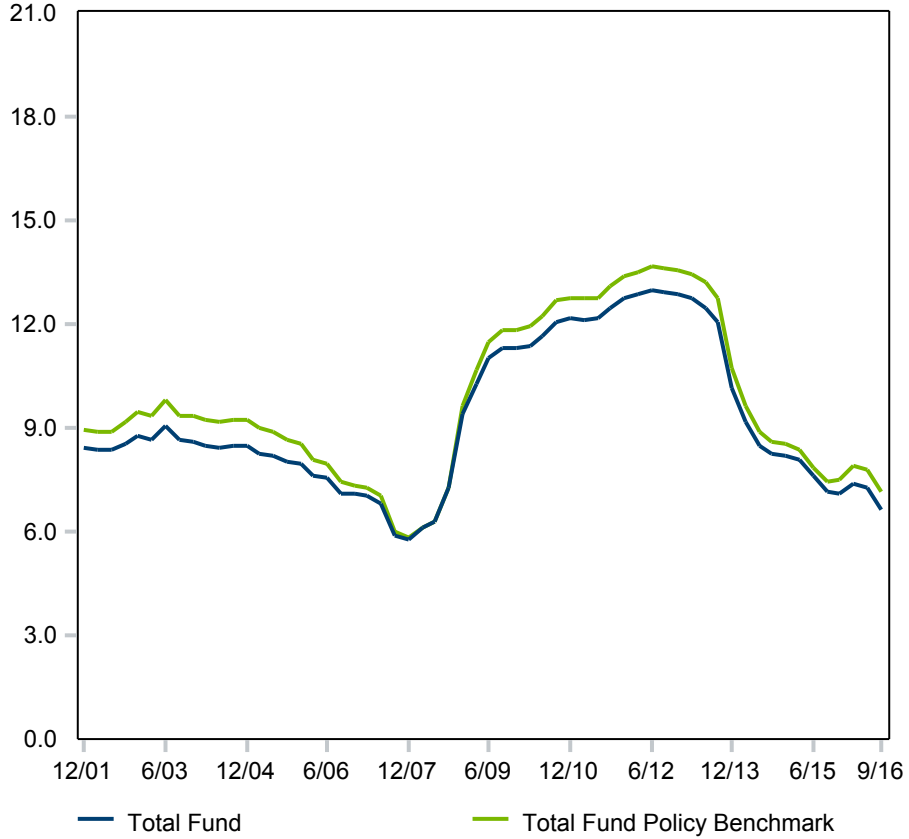
AON Empower Results®

Total Fund Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



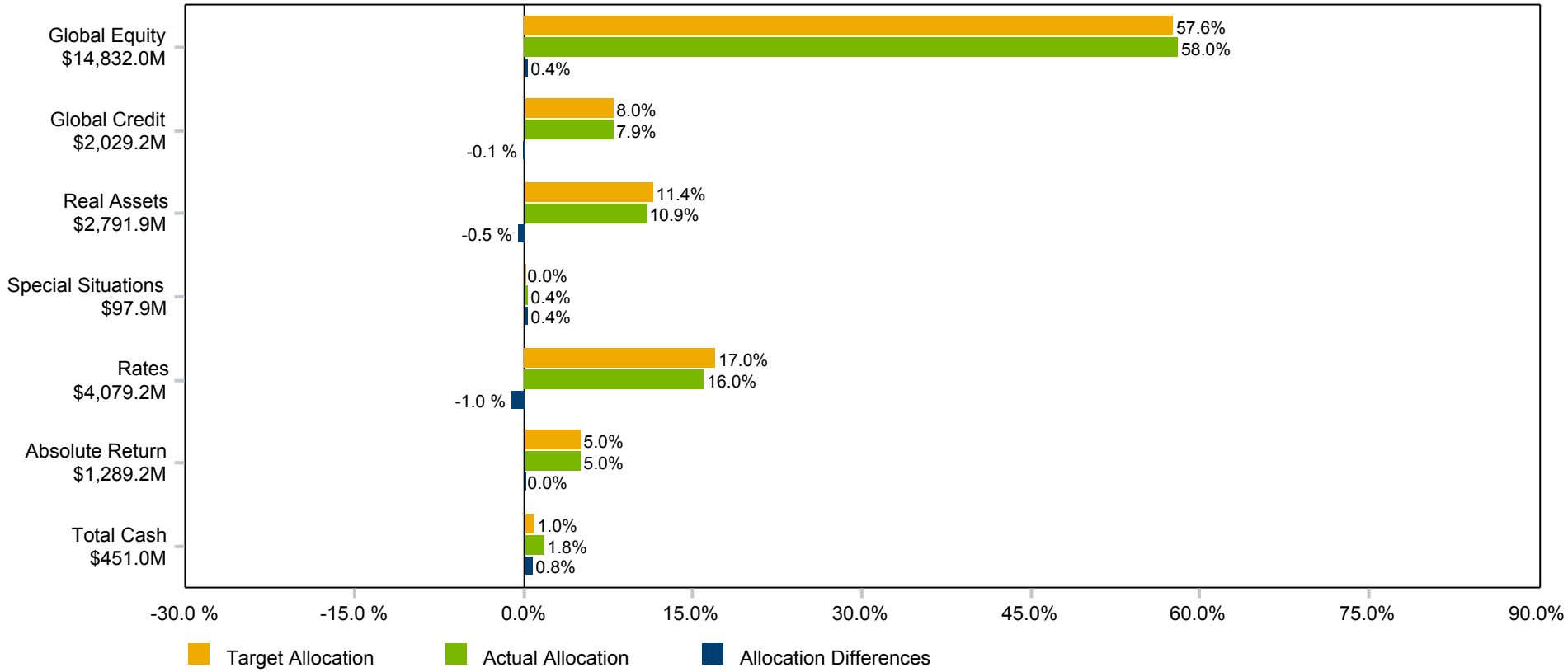
5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Fund	-0.15	1.12	-0.14	0.98	1.30	0.61	0.91	8.79	6.61	0.99
Total Fund Policy Benchmark	0.00	0.00	N/A	1.00	1.22	0.00	1.00	8.91	7.17	1.00
Citigroup 3 Month T-Bill	-8.74	7.16	-1.22	0.00	N/A	0.08	0.00	0.08	0.03	0.04

AON Empower Results®

Asset Allocation Compliance

	Market Value ($)	Current Allocation (%)	Target Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)
Total Fund	25,570,386,973	100.0	100.0	N/A	N/A
Global Equity	14,832,004,609	58.0	57.6	47.2	67.2
Global Credit	2,029,209,501	7.9	8.0	0.0	14.5
Real Assets	2,791,939,559	10.9	11.4	5.5	15.5
Special Situations	97,936,703	0.4	0.0	0.0	0.0
Rates	4,079,152,712	16.0	17.0	15.0	25.0
Absolute Return	1,289,182,114	5.0	5.0	0.0	10.0
Total Cash	450,961,775	1.8	1.0	0.0	1.6



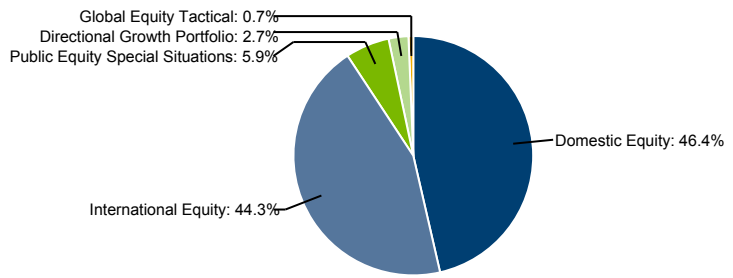
AON Empower Results®

Global Public Equity

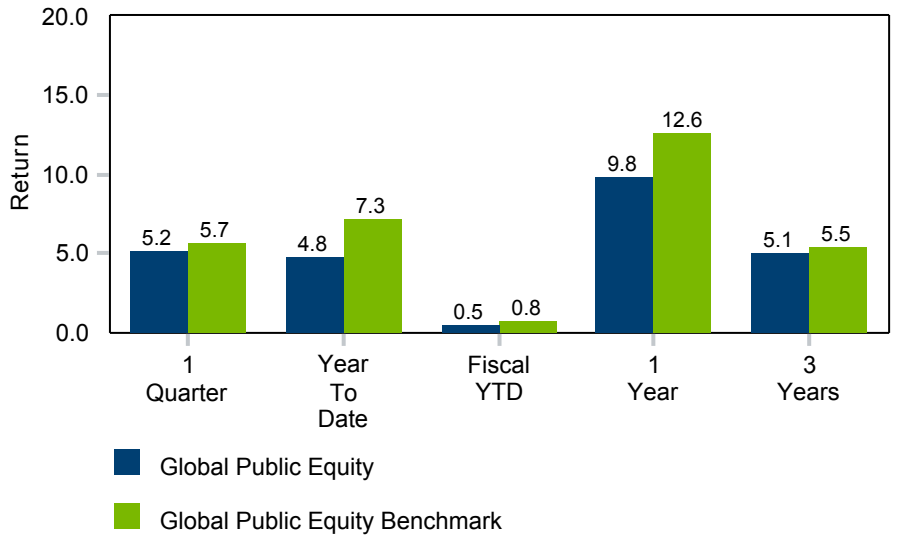
Empower Results®

Global Public Equity Portfolio Overview

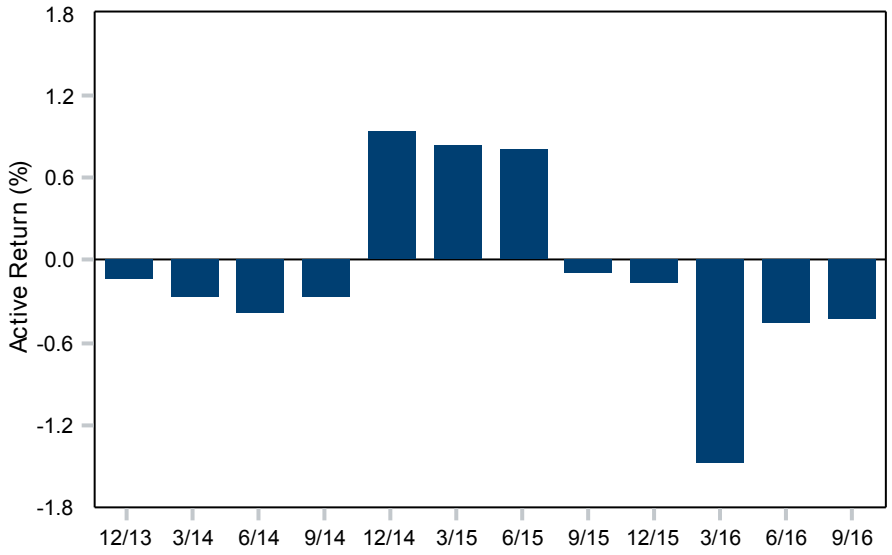
Current Allocation
September 30, 2016 : $12,196M



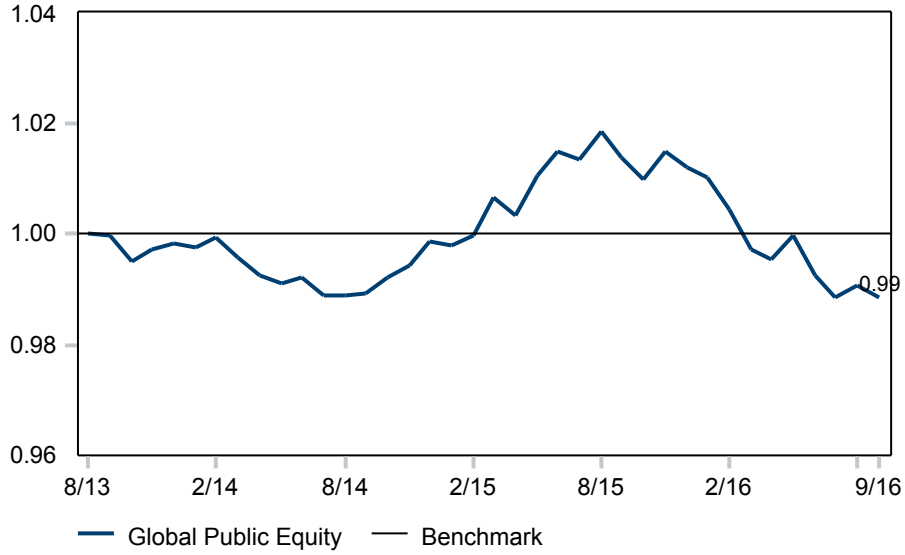
Return Summary



Quarterly Excess Performance



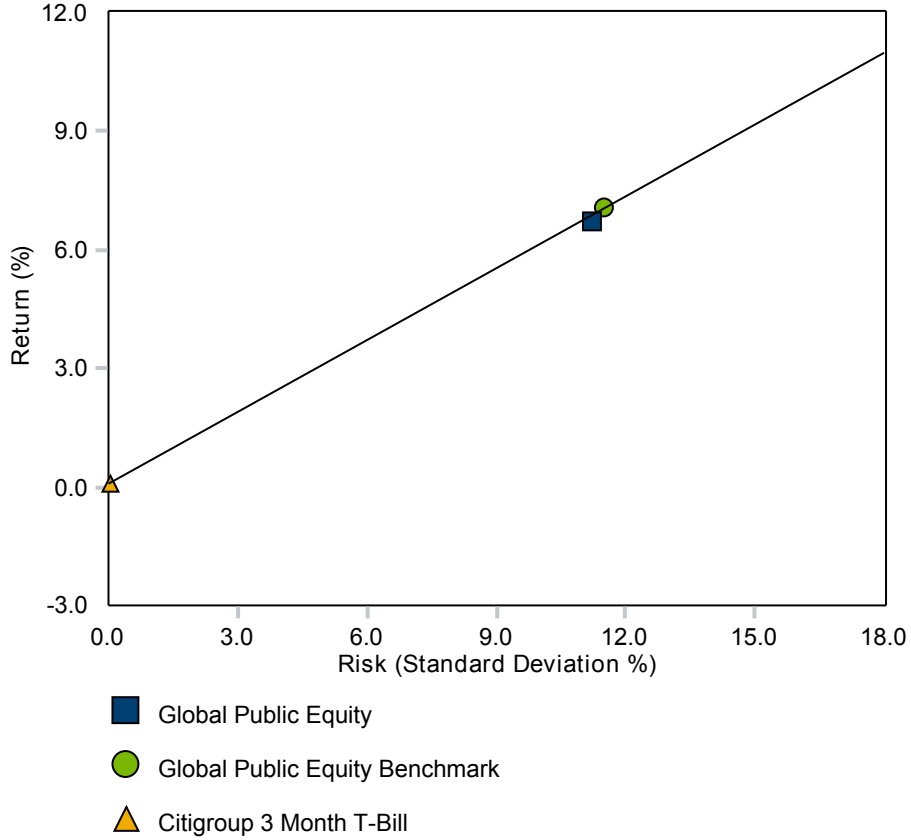
Ratio of Cumulative Wealth - Since Inception



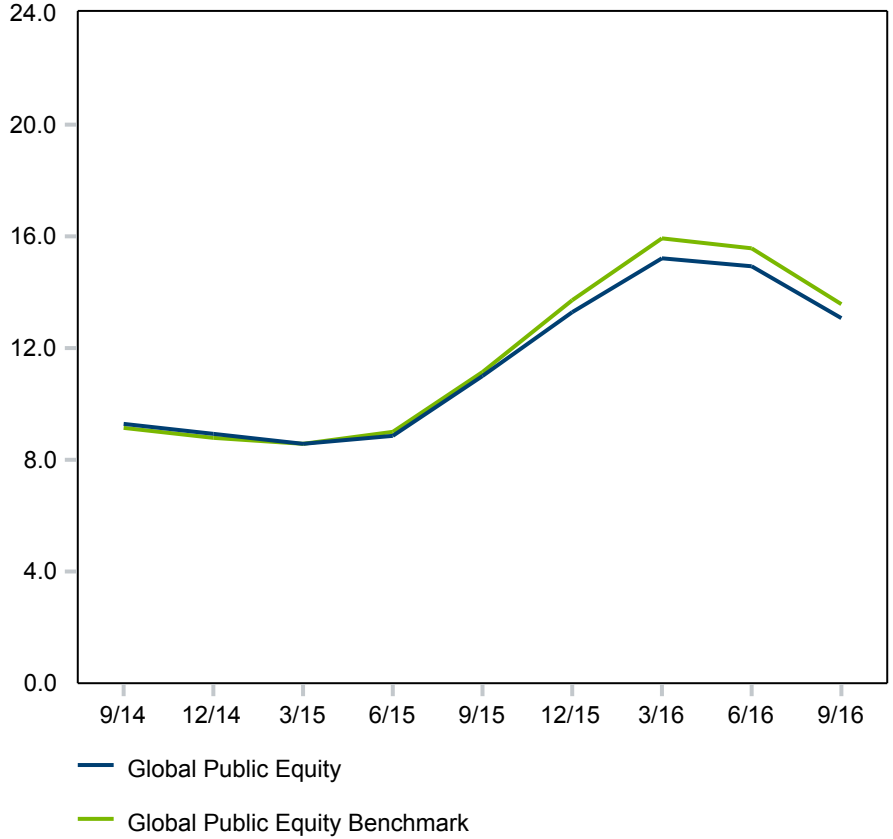
AON Empower Results®

Global Public Equity Risk Profile

Annualized Return vs. Annualized Standard Deviation Since 9/1/2013



Rolling 1 Year Standard Deviation



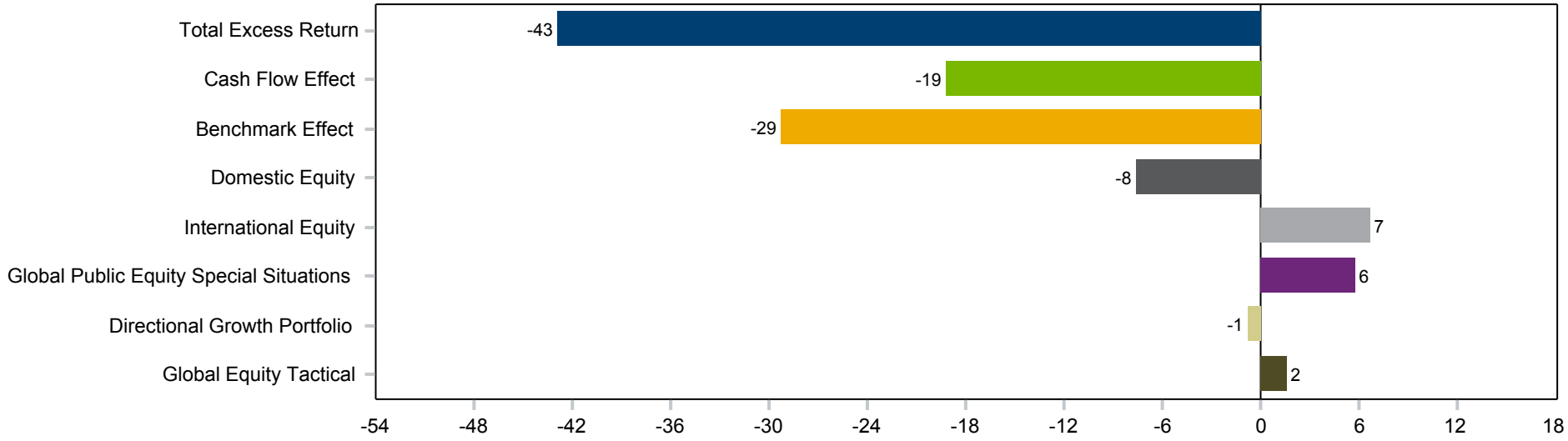
Historical Statistics Since 9/1/2013

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Global Public Equity	-0.40	1.31	-0.31	0.99	0.62	-0.16	0.97	6.68	11.23	0.99
Global Public Equity Benchmark	0.00	0.00	N/A	1.00	0.64	0.00	1.00	7.07	11.54	1.00
Citigroup 3 Month T-Bill	-7.42	11.54	-0.64	0.01	N/A	0.08	0.00	0.08	0.03	0.11

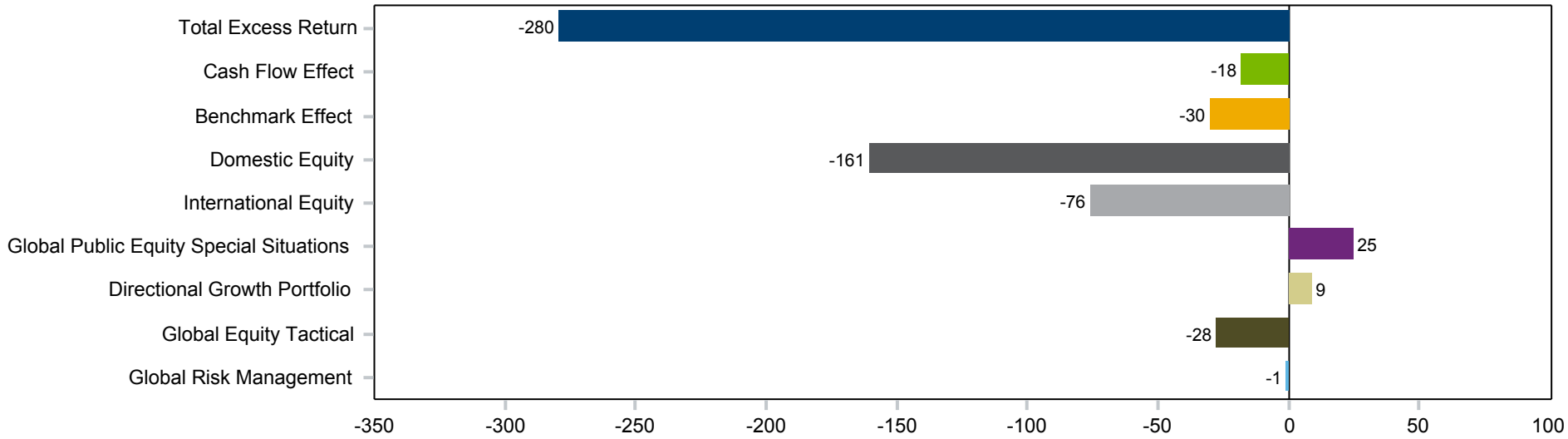
AON Empower Results®

Asset Class Attribution

1 Quarter



1 Year



While the Special Situations, Directional Growth, and Global Equity Tactical component's underlying managers may have domestic or international equity benchmarks, the components are not included in the attribution for domestic and international equity.

AON Empower Results®

Domestic Equity

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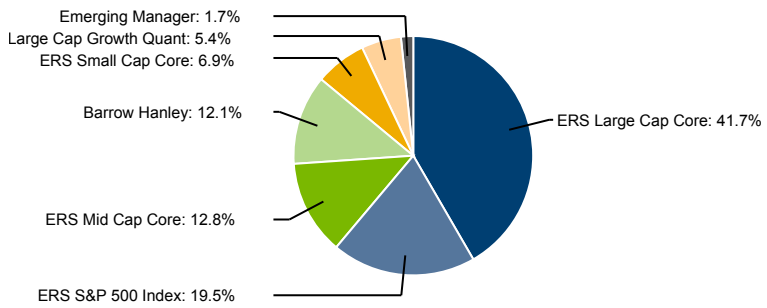
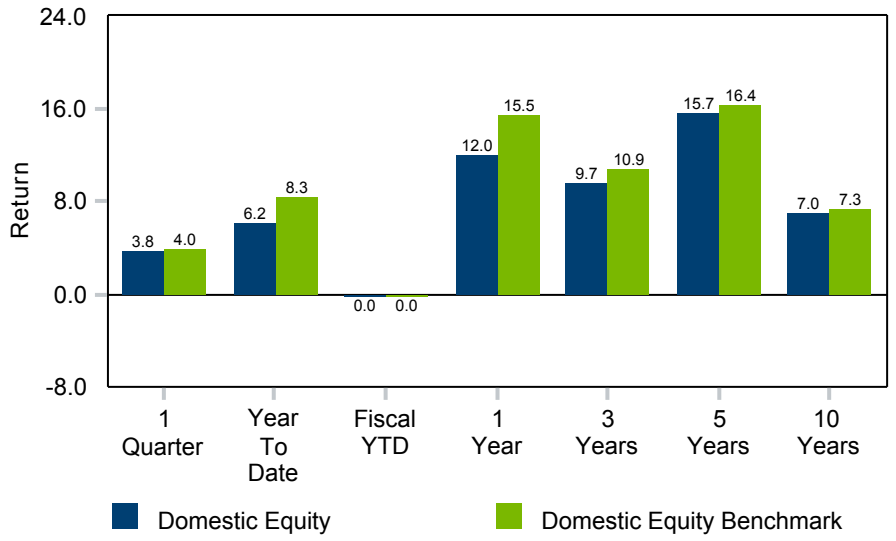
Domestic Equity Portfolio Overview

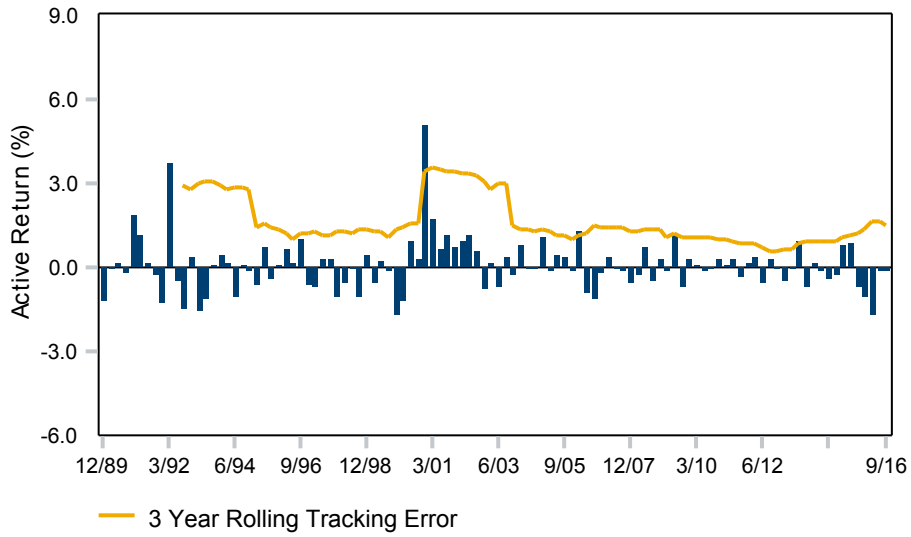
Current Allocation
September 30, 2016 : $5,660M



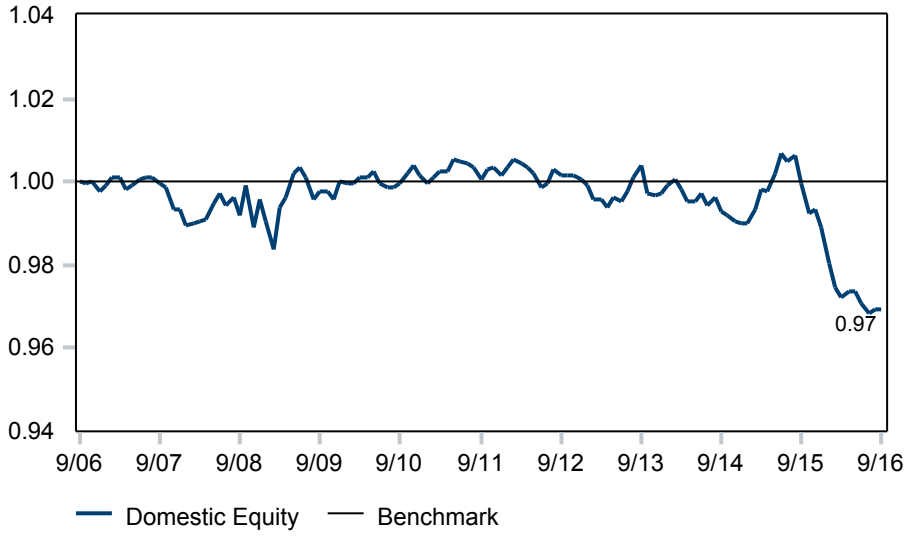
Return Summary



Quarterly Excess Performance



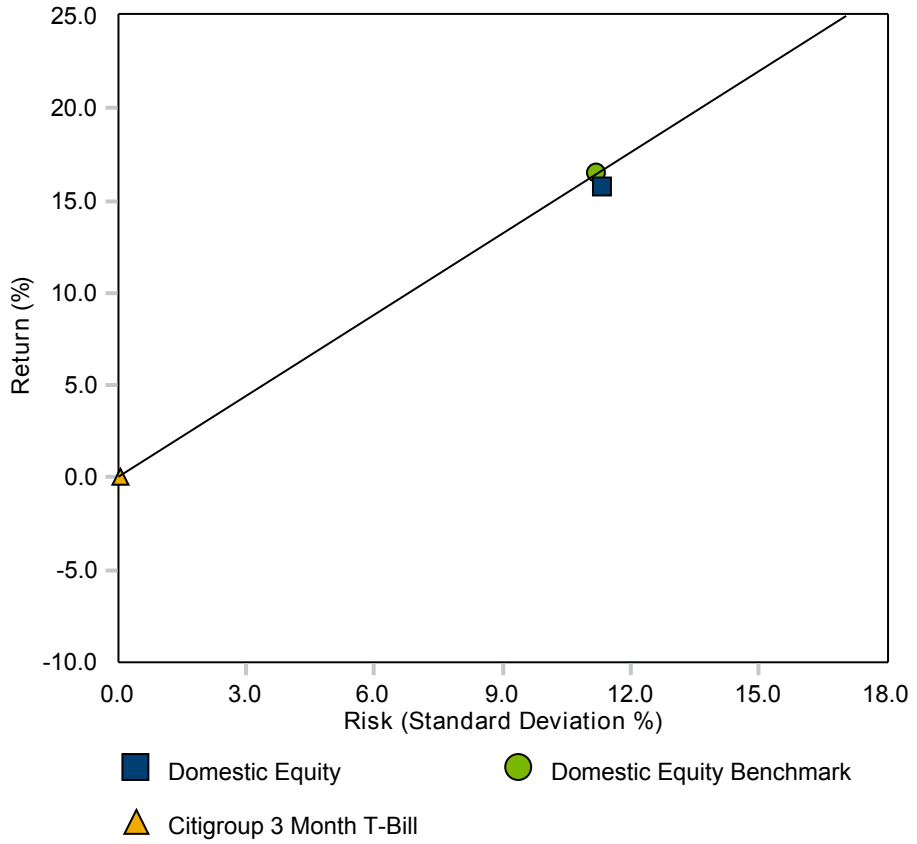
Ratio of Cumulative Wealth - 10 Years



AON Empower Results®

Domestic Equity Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation

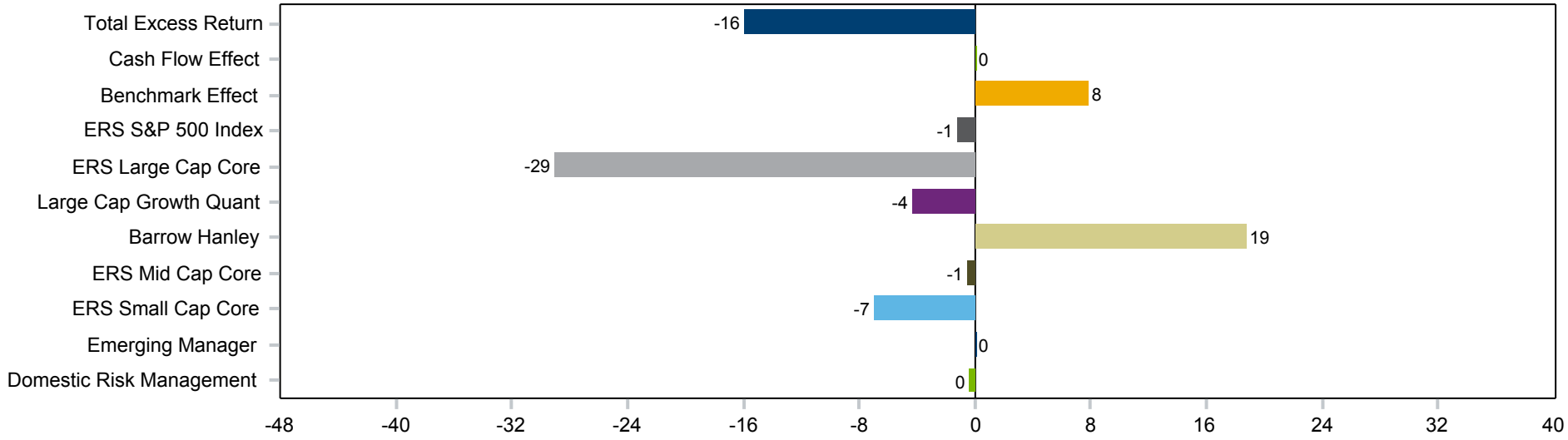
5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Domestic Equity	-0.63	1.03	-0.61	0.99	1.34	-0.73	1.01	15.70	11.34	1.00
Domestic Equity Benchmark	0.00	0.00	N/A	1.00	1.41	0.00	1.00	16.44	11.22	1.00
Citigroup 3 Month T-Bill	-15.85	11.22	-1.41	0.00	N/A	0.08	0.00	0.08	0.03	-0.04

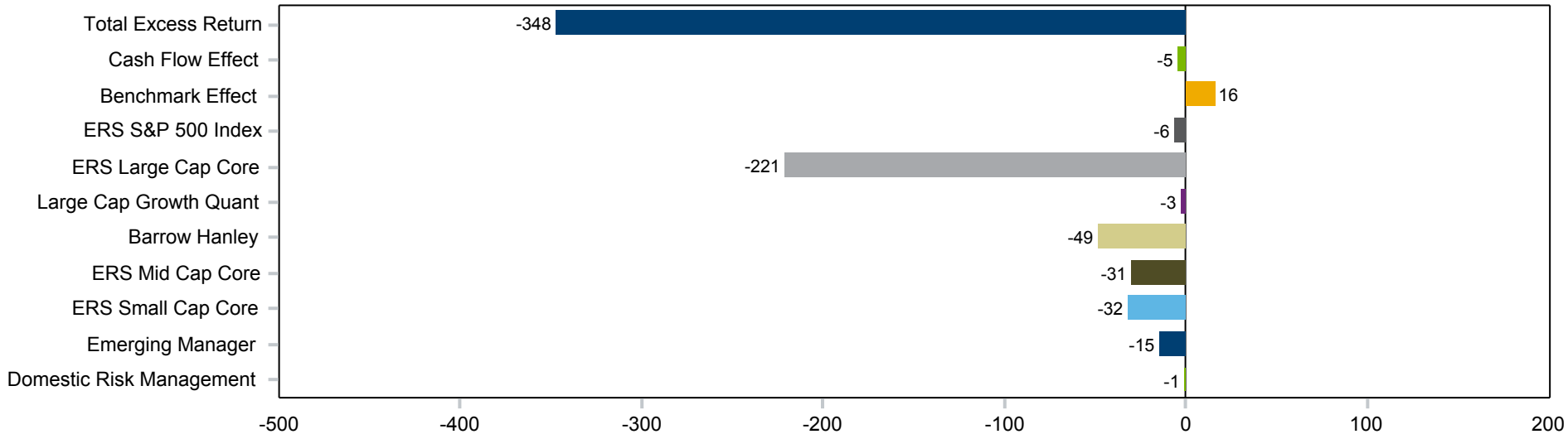
AON Empower Results®

Asset Class Attribution

1 Quarter



1 Year



AON Empower Results®

International Equity

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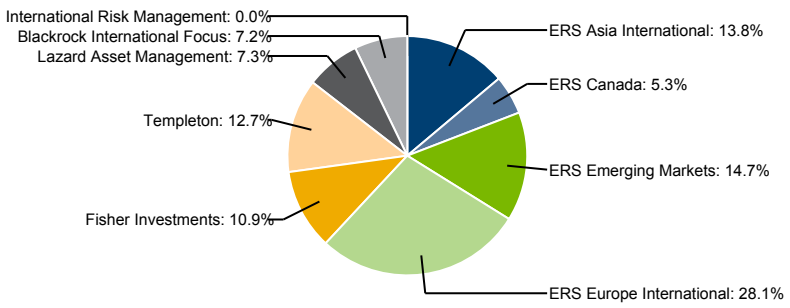
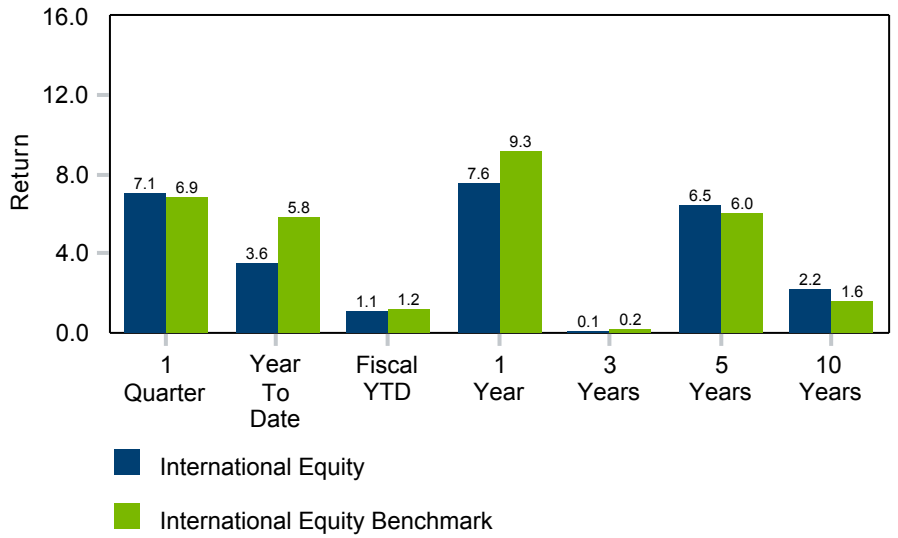
Empower Results®

International Equity Portfolio Overview

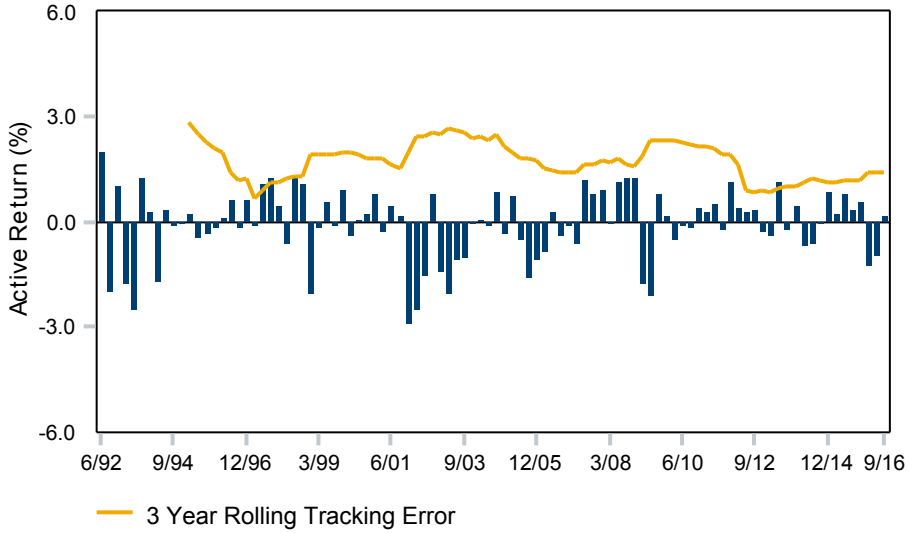
Current Allocation
September 30, 2016 : $5,408M



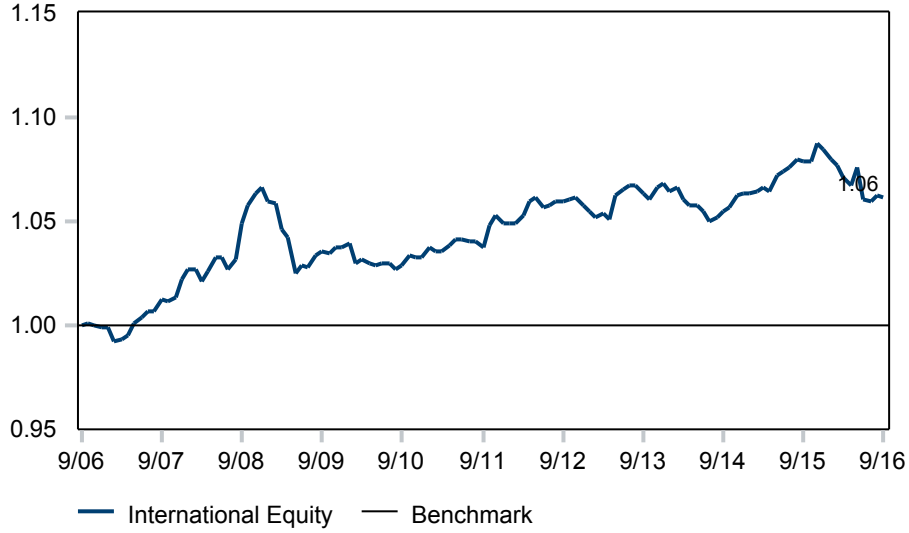
Return Summary



Quarterly Excess Performance



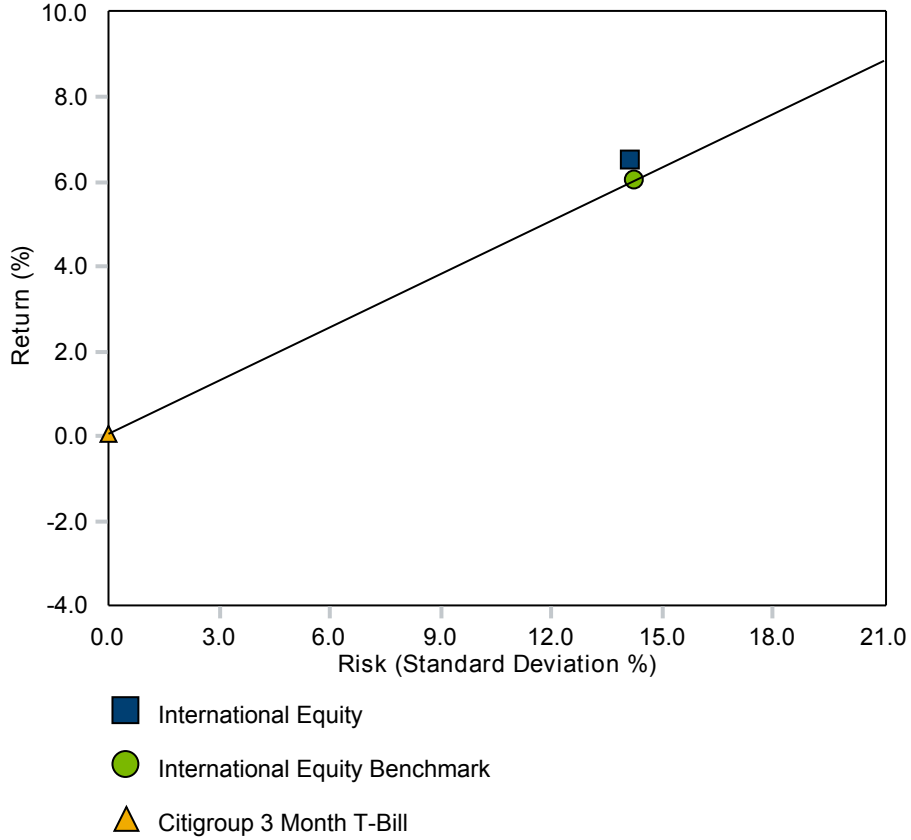
Ratio of Cumulative Wealth - 10 Years



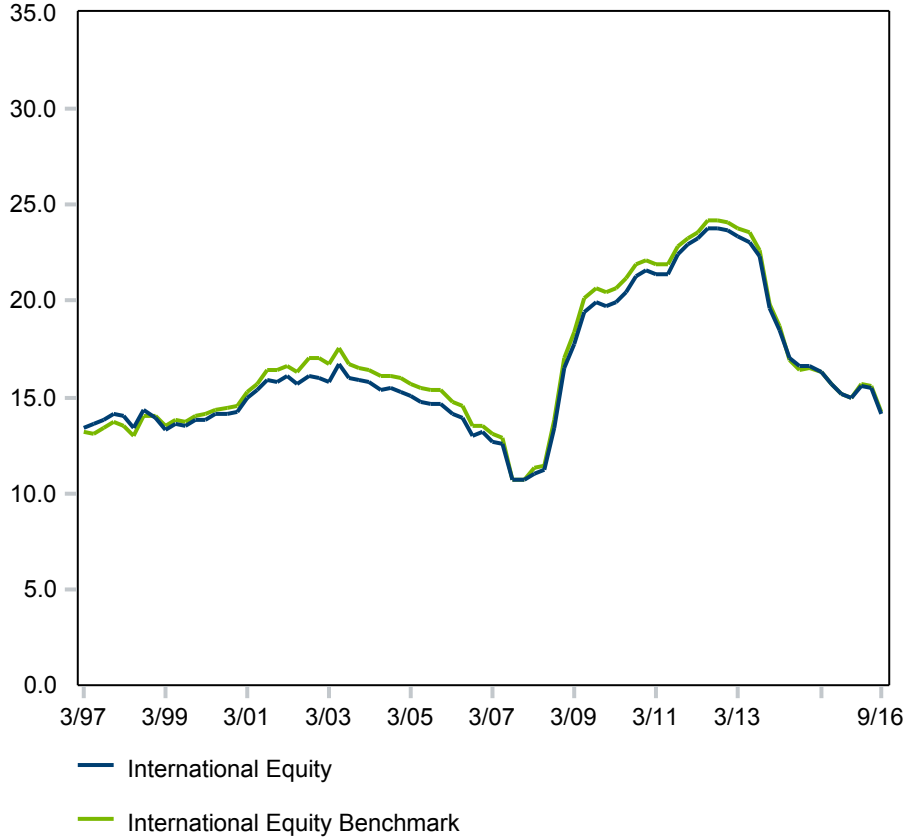
AON Empower Results®

International Equity Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



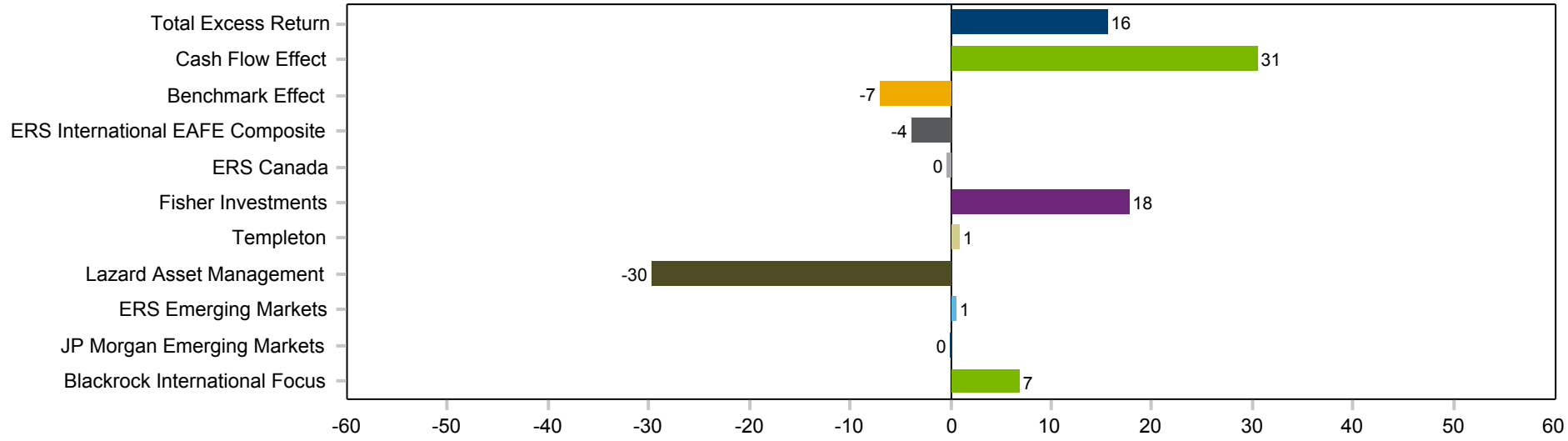
5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
International Equity	0.45	1.46	0.31	0.99	0.51	0.54	0.99	6.53	14.12	0.99
International Equity Benchmark	0.00	0.00	N/A	1.00	0.48	0.00	1.00	6.04	14.23	1.00
Citigroup 3 Month T-Bill	-6.80	14.23	-0.48	0.00	N/A	0.08	0.00	0.08	0.03	0.07

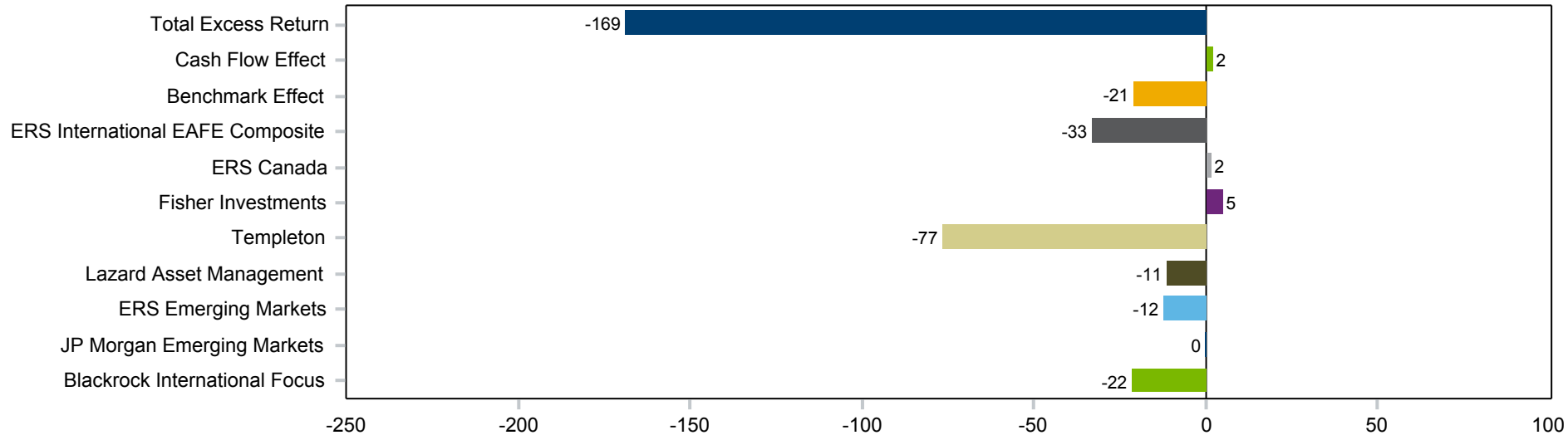
AON Empower Results®

Asset Class Attribution

1 Quarter



1 Year



AON Empower Results®

Private Equity

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Empower Results®

As of September 30, 2016

Overview

	Internal Rate of Return(%)			
	1 Year	3 Years	5 Years	Since Inception
Private Equity	6.0	11.0	12.2	10.8

Private Equity Program Summary by Fiscal Year as of 9/30/2016

ERS FY	# of Deals	Capital Committed	Capital Called	Distributions	Market Value
1999	1	$100,000,000	-$88,405,114	$129,578,992	$0
2007	1	$60,585,106	-$57,227,107	$114,604,489	$315,091
2008	3	$196,960,000	-$231,442,502	$295,470,705	$74,992,558
2009	12	$909,670,400	-$997,756,852	$1,032,882,457	$371,444,576
2010	7	$455,820,000	-$475,594,573	$427,214,928	$164,657,171
2011	9	$649,200,000	-$597,275,323	$275,944,610	$422,233,260
2012	7	$501,773,006	-$378,937,847	$173,396,857	$370,670,034
2013	7	$437,532,419	-$314,014,651	$89,139,336	$250,050,698
2014	13	$1,191,681,539	-$613,398,110	$44,674,433	$607,616,981
2015	11	$934,485,000	-$247,037,781	$53,549,306	$226,736,291
2016	9	$743,180,176	-$138,872,292	$230,543	$142,118,088
2017	1	$25,000,000	$0	$0	$0
Grand Total	**81**	**$6,205,887,646**	**$4,139,962,154**	**$2,636,686,657**	**$2,630,834,748**

*Internal Rate of Return figures include market value adjustments made after 9/30/2016.
*Total portfolio market value includes FX contracts and STIF balance.

AON Empower Results®

Overview

Private Equity Program Summary By Fund as of 9/30/2016

Deal #	Fund Name	ERS FY	Commitment Date	Capital Committed	Capital Called	Distributions	Market Value
1	Texas Growth Fund II	1999	December-98	$100,000,000			
2	Southwest Opps Partners LP	2007	May-07	$60,585,106			
3	New Mountain Partners III, L.P.	2008	November-07	$60,000,000			
4	Carlyle Partners V, L.P.	2008	March-08	$100,000,000			
5	Advent International GPE VI-C, L.P.	2008	March-08	$36,960,000			
6	Brazos Equity Fund III, L.P.	2009	September-08	$37,500,000			
7	Wind Point Partners VII, L.P.	2009	October-08	$65,000,000			
8	Charterhouse Capital Partners IX, L.P.	2009	December-08	$59,360,000			
9	CVC European Equity Partners V (B) LP	2009	December-08	$88,110,400			
10	Hellman & Friedman Capital Partners VII, L.P.	2009	January-09	$100,000,000			
11	Navis Asia Fund VI, L.P.	2009	February-09	$60,000,000			
12	TA Subordinated Debt Fund III, L.P.	2009	April-09	$50,000,000			
13	TA XI, L.P.	2009	April-09	$100,000,000			
14	Riverside Capital Appreciation Fund V, L.P.	2009	April-09	$100,000,000			
15	Triton Fund III, LP	2009	July-09	$67,200,000			
16	Lexington Capital Partners VII, L.P.	2009	August-09	$100,000,000			
17	Littlejohn Fund IV, L.P.	2009	August-09	$82,500,000			
18	Quantum Energy Partners V, L.P.	2010	September-09	$75,000,000			
19	HG Capital 6	2010	October-09	$58,500,000			
20	LGT Crown Global Secondaries II PLC	2010	February-10	$75,000,000			
21	Mason Wells Buyout Fund III, L.P.	2010	February-10	$65,000,000			
22	Advent Latin America Fund V-H ,L.P.	2010	March-10	$50,000,000			
23	Riverside Europe Fund IV, L.P.	2010	March-10	$82,320,000			
24	Southern Cross Latin America PE Fund IV, L.P.	2010	July-10	$50,000,000			
25	Baring Asia Private Equity Fund V, L.P.	2011	November-10	$50,000,000			
26	ERS Private Equity Emerging Manager Fund I, L.P.	2011	December-10	$50,000,000			
27	Euroknights VI No. 1 LP	2011	January-11	$39,200,000			
28	Gores Capital Partners III L.P.	2011	January-11	$100,000,000			
29	Private Equity International Fund I, LP	2011	March-11	$165,000,000			
30	KSL Capital Partners III L.P.	2011	July-11	$95,000,000			
31	Summer Street Capital III, LP	2011	July-11	$50,000,000			
32	Longitude Venture Partners II LP	2011	August-11	$50,000,000			
33	RLH Investors III, LP	2011	August-11	$50,000,000			
34	LGT Crown Global Secondaries III PLC	2012	October-11	$100,000,000			
35	HitecVision VI, L.P.	2012	November-11	$70,000,000			
36	Frontier Fund III LP	2012	December-11	$50,000,000			
37	Advent International GPE VII-C LP	2012	June-12	$100,000,000			
38	Castlelake II, LP	2012	July-12	$75,000,000			
39	Court Square Capital Partners III, L.P.	2012	August-12	$75,000,000			
40	Private Equity Co-Investments 2012	2012	Various	$31,773,006			

AON Empower Results®

Overview

Private Equity Program Summary By Fund as of 9/30/2016

Deal #	Fund Name	ERS FY	Commitment Date	Capital Committed	Capital Called	Distributions	Market Value
41	Southern Cross Latin America Fund IV, L.P. (Secondary)	2013	September-12	$25,000,000			
42	Riverside Capital Appreciation Fund VI, L.P.	2013	December-12	$100,000,000			
43	HGCapital 7 A L.P.	2013	March-13	$39,000,000			
44	Blue Wolf Capital Fund III, LP	2013	April-13	$50,000,000			
45	Triton Fund IV LP	2013	April-13	$78,400,000			
46	CVC Capital Partners VI (B) L.P.	2013	July-13	$79,520,000			
47	Private Equity Co-Investments 2013	2013	Various	$65,612,419			
48	Industry Ventures Secondary VII	2014	October-13	$40,000,000			
49	Industry Ventures Special Opportunities II	2014	October-13	$47,500,000			
50	KSL Credit Opportunities Fund I	2014	December-13	$50,000,000			
51	Navis Asia Fund VII LP	2014	December-13	$125,000,000			
52	Triton Debt Opportunities Fund I US LP	2014	January-14	$41,440,000			
53	Castlelake III LP	2014	February-14	$100,000,000			
54	HitecVision VII LP	2014	April-14	$70,000,000			
55	Cotton Creek Capital Partners II LP	2014	May-14	$31,500,000			
56	Energy & Minerals Group Fund III LP	2014	June-14	$80,471,000			
57	Carlyle Global Financial Services Partners II LP	2014	June-14	$100,000,000			
58	ERS Private Equity International II, L.P	2014	June-14	$300,000,000			
59	Quantum Energy Partners VI LP	2014	June-14	$100,000,000			
60	Private Equity Co-Investments 2014	2014	Various	$105,770,539			
61	Hellman & Friedman Capital Partners VIII, L.P	2015	September-14	$82,500,000			
62	Baring Asia Private Equity Fund VI, L.P.	2015	October-14	$75,000,000			
63	Landmark Equity Partners XV LP	2015	October-14	$175,000,000			
64	Landmark TX ERS Co-Investment Fund I, L.P.	2015	October-14	$125,000,000			
65	ERS Private Equity Emerging Manager Fund II LP	2015	December-14	$50,000,000			
66	KSL Capital Partners IV, LP	2015	January-15	$125,000,000			
67	Frontier Fund IV, L.P.	2015	February-15	$60,000,000			
68	Carlyle Energy Mezzanine Opportunities Fund II, LP	2015	March-15	$85,000,000			
69	TA XII- A, L.P.	2015	June-15	$62,500,000			
70	Private Equity Co-Investments 2015	2015	Various	$69,485,000			
71	TA Subordinated Debt Fund IV, L.P.	2015	July-15	$25,000,000			
72	Castlelake IV, L.P.	2016	September-15	$100,000,000			
73	Private Equity Co-Investments 2016	2016	Various	$35,680,176			
74	Southern Cross Latin America Private Equity Fund V, LP	2016	October-15	$60,000,000			
75	Advent International GPE VIII-B-1, L.P.	2016	February-16	$110,000,000			
76	Crown Global Secondaries IV PLC	2016	April-16	$200,000,000			
77	Crown Secondaries Special Opportunities plc	2016	April-16	$100,000,000			
78	Industry Ventures Secondary VIII, L.P.	2016	April-16	$40,000,000			
79	Industry Ventures Special Opportunities Fund III-A, L.P.	2016	April-16	$47,500,000			
80	The Energy & Minerals Group Fund IV, LP	2016	April-16	$50,000,000			
81	Private Equity Co-Investments 2017	2017	Various	$25,000,000			
Total				**$6,205,887,646**	**$4,139,962,154**	**$2,636,686,657**	**$2,630,834,748**

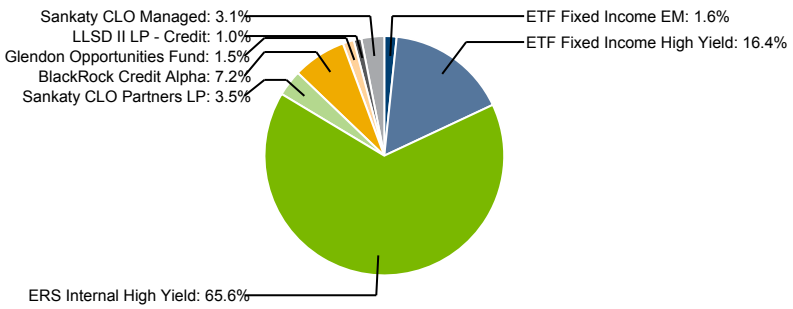
AON Empower Results®

Global Credit

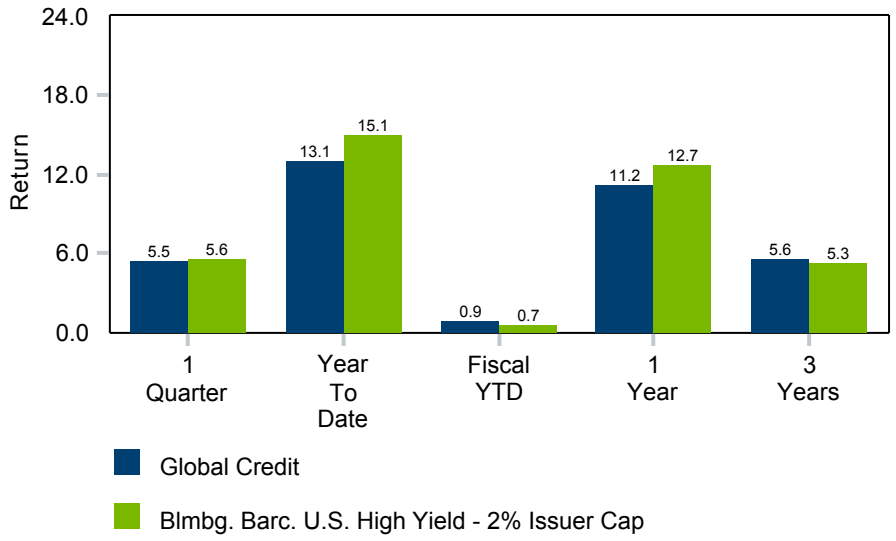
Empower Results®

Global Credit Portfolio Overview

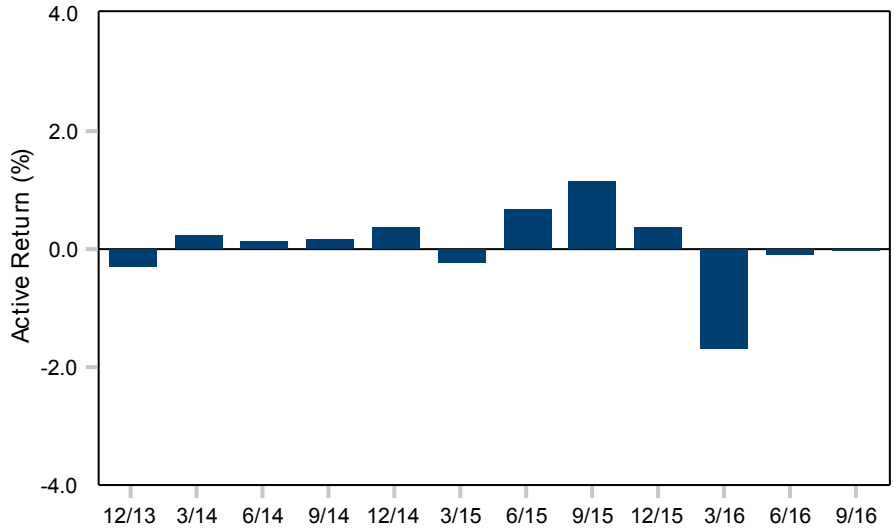
Current Allocation
September 30, 2016 : $2,029M



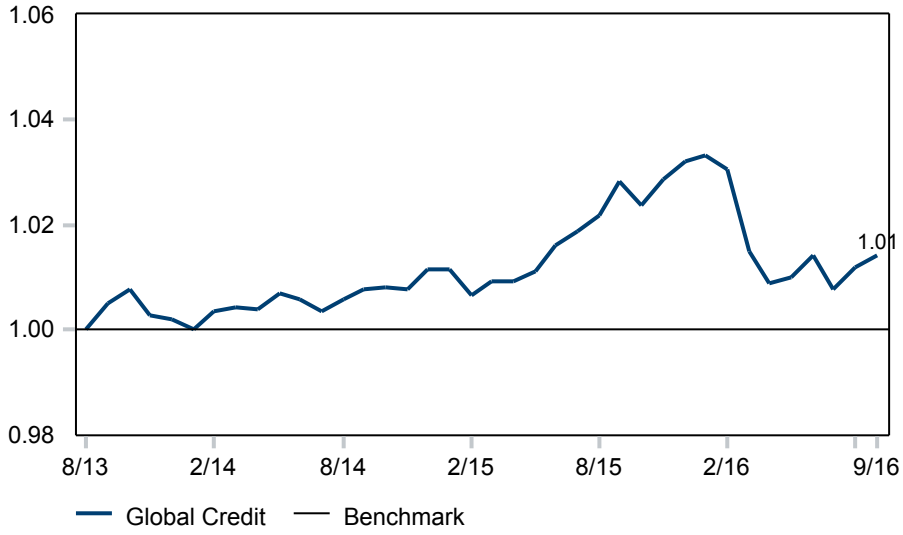
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception

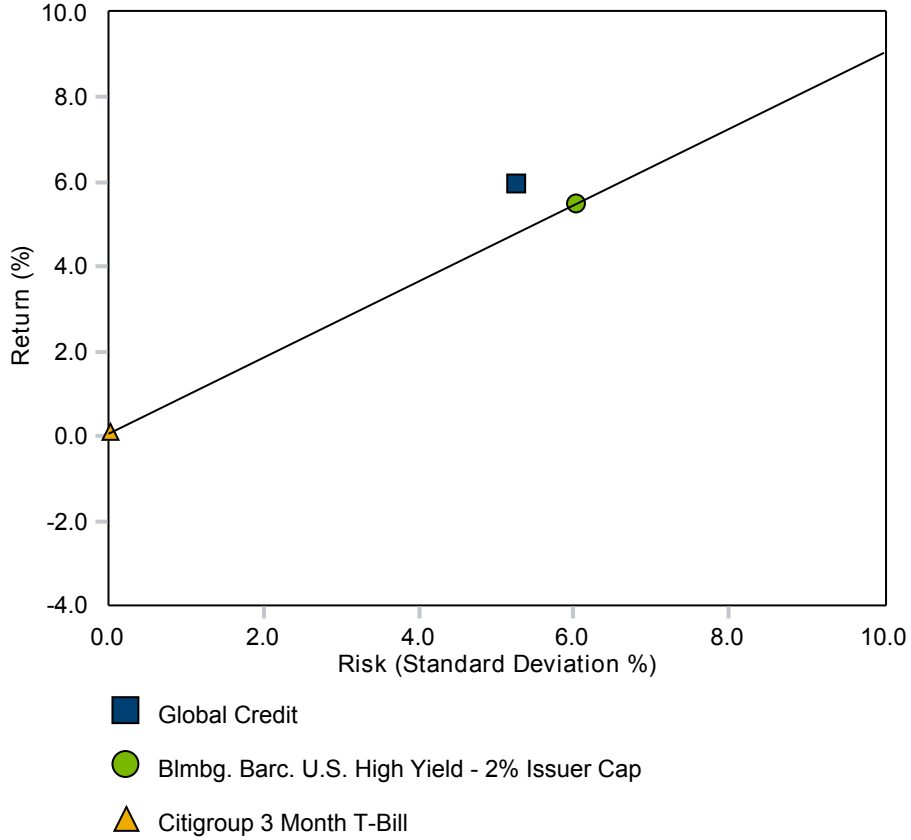


*During the second quarter of 2016 Barclays changed pricing sources for the Barclays U.S. High Yield 2% Issuer Cap (the primary benchmark for the Total Global Credit component), the source change resulted in a 0.13% increase in the return relative to the legacy pricing source.

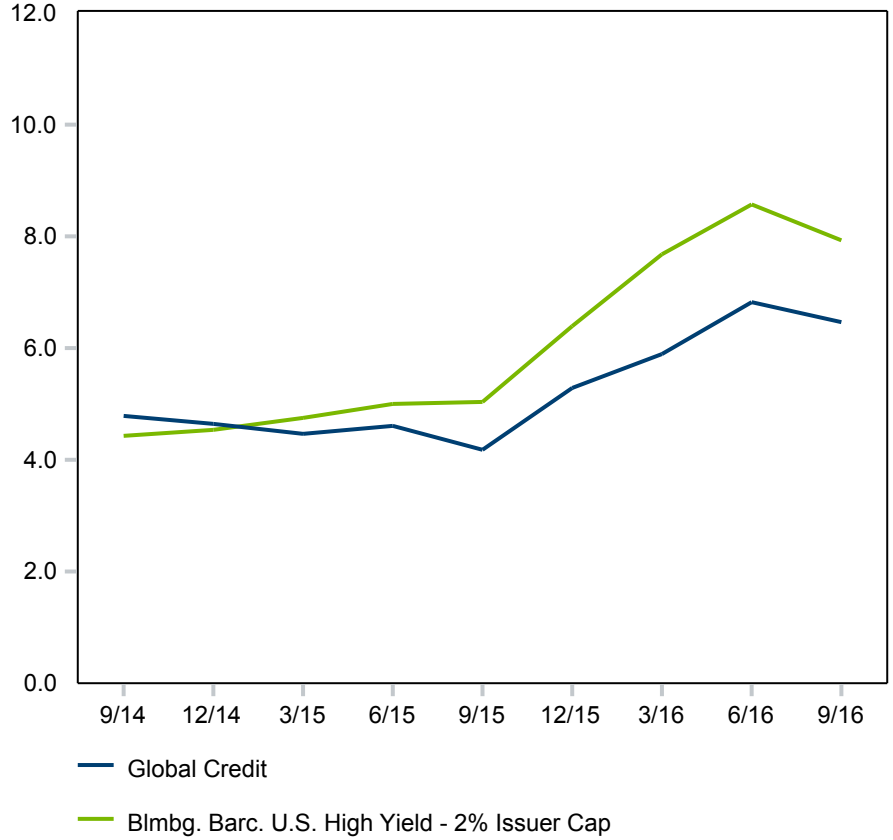
AON Empower Results®

Global Credit Risk Profile

Annualized Return vs. Annualized Standard Deviation Since 9/1/2013



Rolling 1 Year Standard Deviation



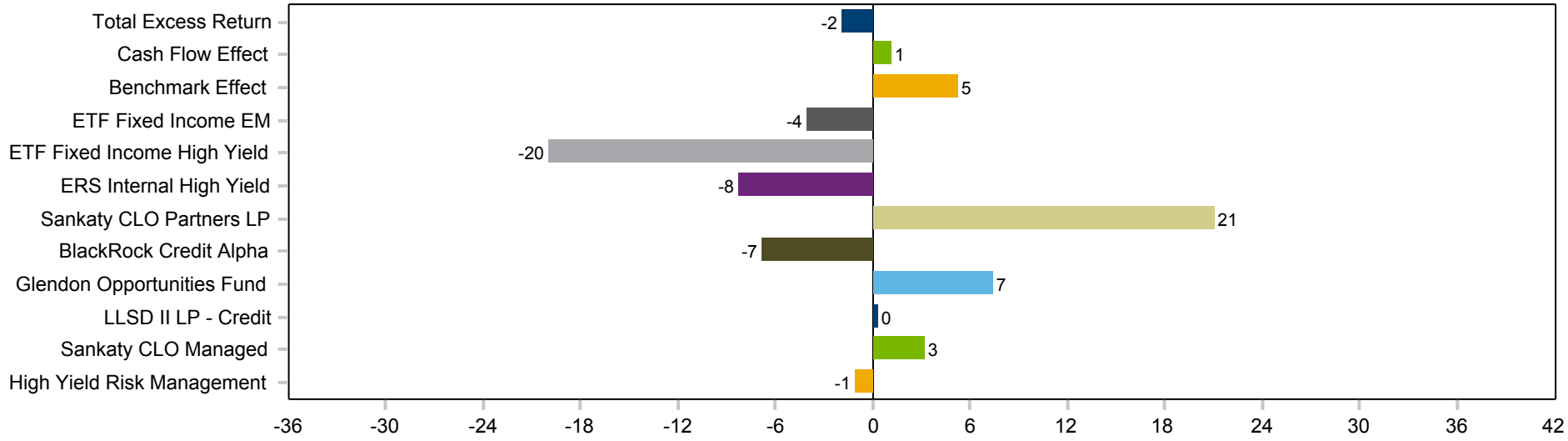
Historical Statistics Since 9/1/2013

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Global Credit	0.42	1.48	0.28	0.95	1.12	1.25	0.85	5.97	5.27	0.98
Blmbg. Barc. U.S. High Yield - 2% Issuer Cap	0.00	0.00	N/A	1.00	0.90	0.00	1.00	5.49	6.04	1.00
Citigroup 3 Month T-Bill	-5.45	6.03	-0.90	0.16	N/A	0.07	0.00	0.08	0.03	0.40

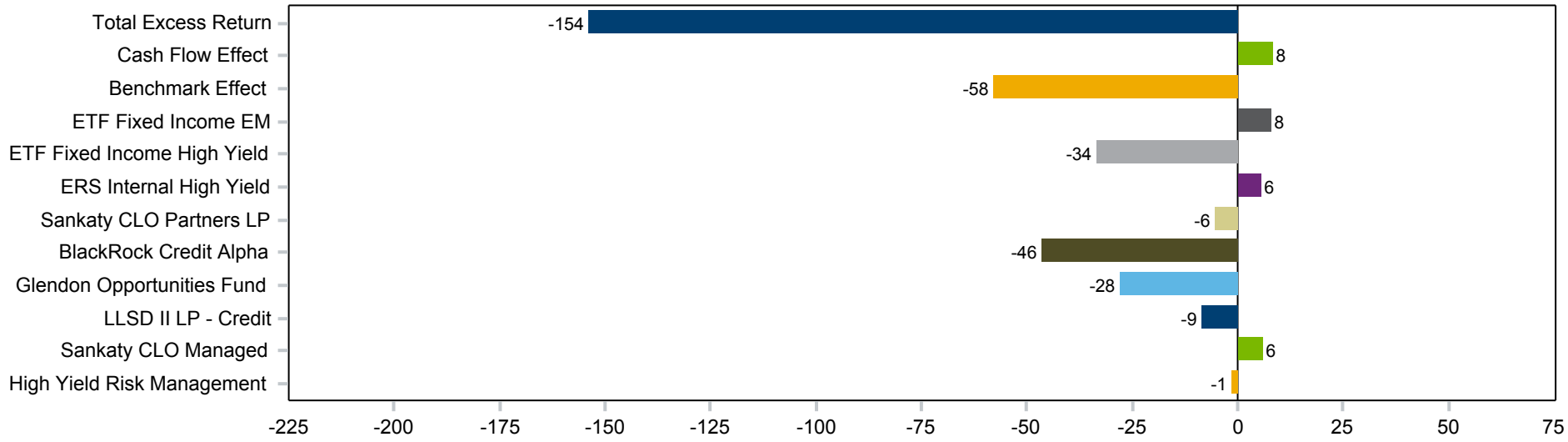
AON Empower Results®

Asset Class Attribution

1 Quarter



1 Year



*During the second quarter of 2016 Barclays changed pricing sources for the Barclays U.S. High Yield 2% Issuer Cap (the primary benchmark for the Total Global Credit component), the source change resulted in a 0.13% increase in the return relative to the legacy pricing source.

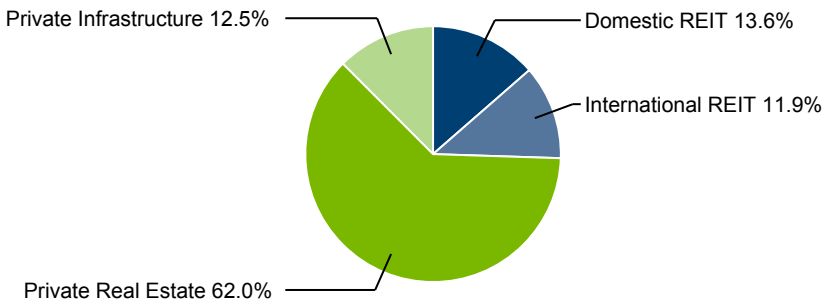
AON Empower Results®

Real Assets

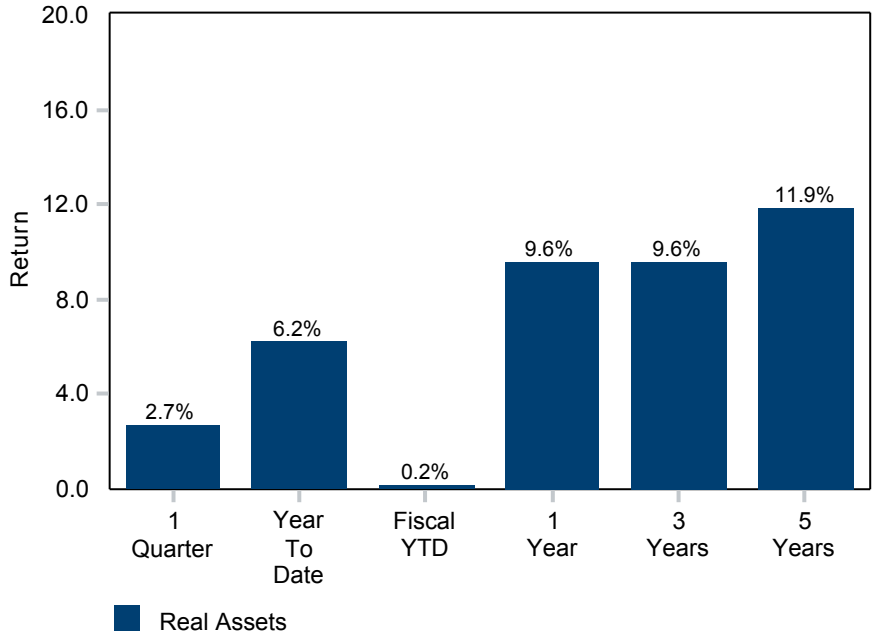
Empower Results®

Real Assets Portfolio Overview

Current Allocation
September 30, 2016 : $2,792M



Return Summary

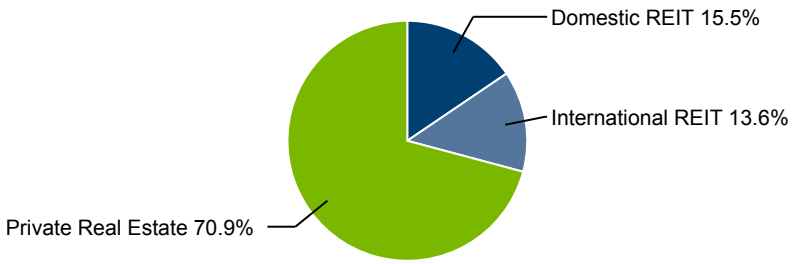


*Actual performance since 8/31/13, longer performance history was created synthetically

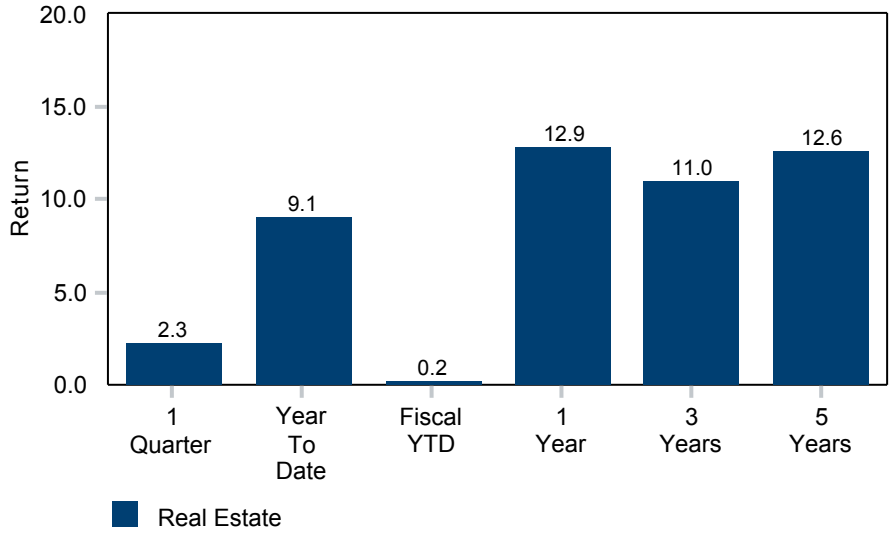
AON Empower Results®

Real Estate Portfolio Overview

Current Allocation
September 30, 2016 : $2,443M



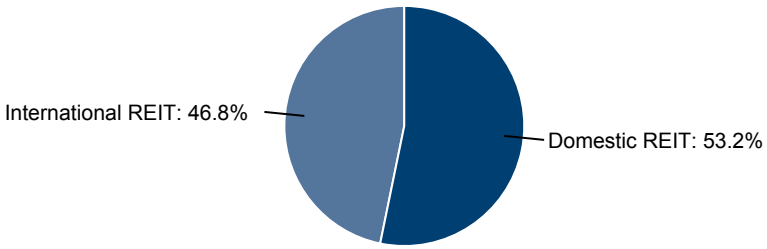
Return Summary



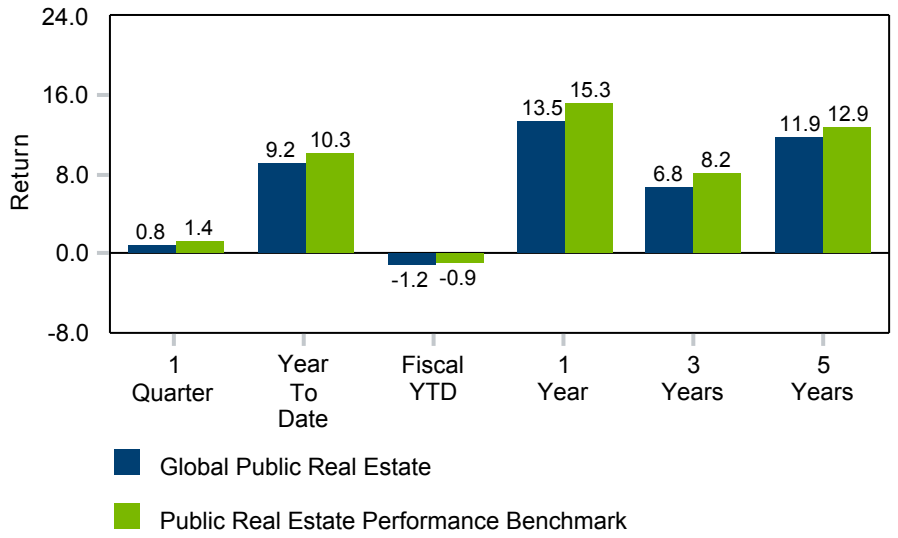
AON Empower Results®

Global Public Real Estate Portfolio Overview

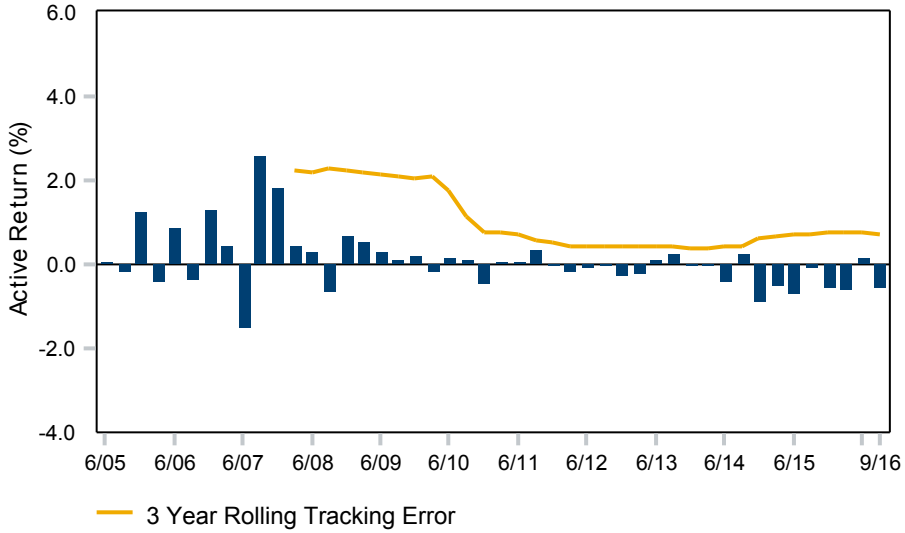
Current Allocation
September 30, 2016 : $712M



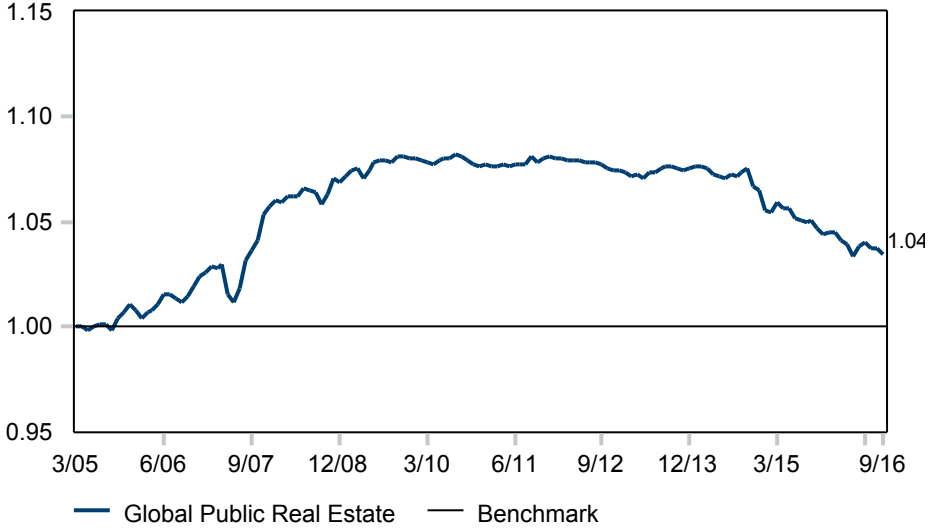
Return Summary



Quarterly Excess Performance



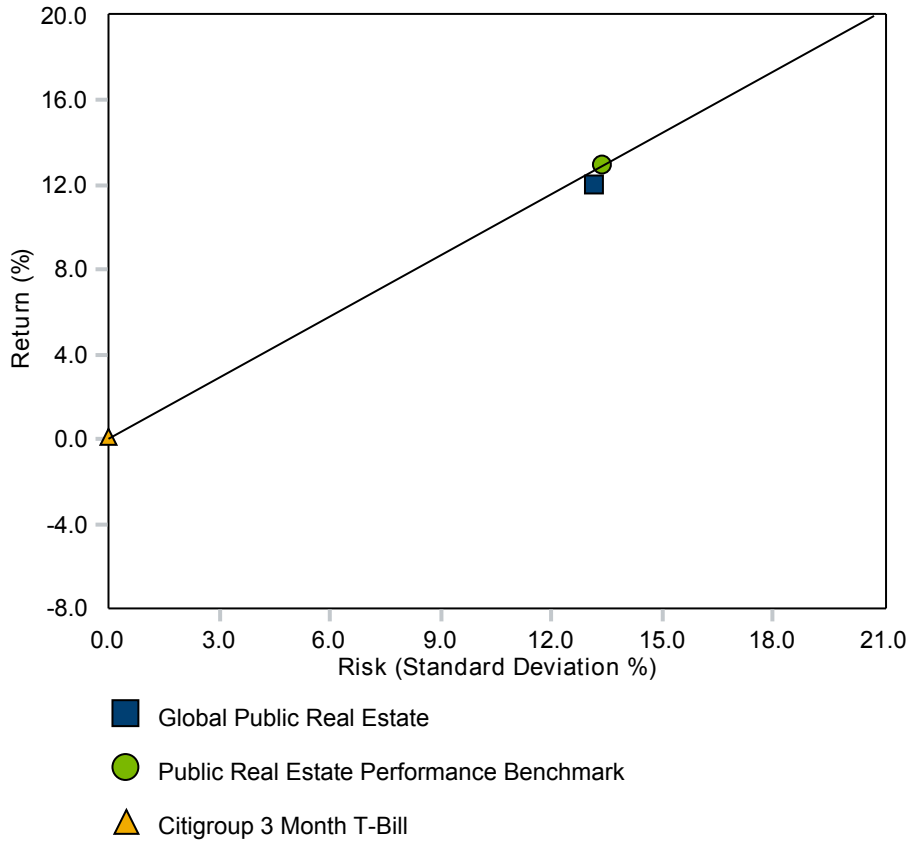
Ratio of Cumulative Wealth - Since Inception



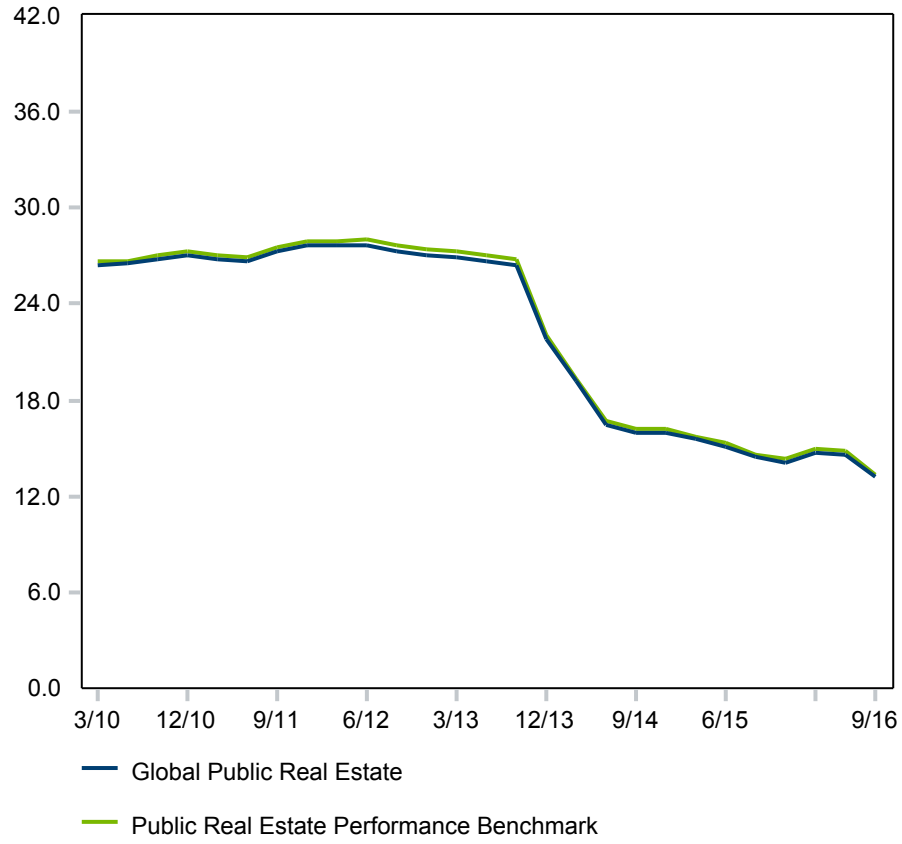
AON Empower Results®

Global Public Real Estate Risk Profile

Annualized Return vs. Annualized Standard Deviation 5 Years



Rolling 5 Years Standard Deviation



5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Global Public Real Estate	-0.91	0.84	-1.07	1.00	0.92	-0.71	0.99	11.94	13.20	1.00
Public Real Estate Performance Benchmark	0.00	0.00	N/A	1.00	0.97	0.00	1.00	12.93	13.37	1.00
Citigroup 3 Month T-Bill	-13.01	13.37	-0.97	0.00	N/A	0.08	0.00	0.08	0.03	0.04

AON Empower Results®

Overview

	Internal Rate of Return(%)			
	1 Year	3 Years	5 Years	Since Inception
Private Real Estate	9.3	12.6	12.6	12.8

Private Real Estate Program Summary by Fiscal Year as of 9/30/2016

ERS FY	# of Deals	Capital Committed	Capital Called	Distributions	Market Value
2010	2	$136,300,000	$135,231,392	$54,153,694	$145,962,678
2011	7	$599,200,000	$623,145,384	$541,846,403	$411,488,291
2012	7	$495,200,000	$521,831,106	$318,878,508	$400,772,313
2013	5	$409,080,000	$331,808,437	$205,023,185	$218,236,083
2014	10	$492,640,000	$396,940,361	$112,291,074	$321,155,131
2015	8	$500,800,075	$195,139,350	$32,536,871	$174,741,173
2016	6	$245,000,000	$69,406,232	$9,508,048	$56,643,673
Total	**45**	**$2,878,220,075**	**$2,273,502,262**	**$1,274,237,784**	**$1,728,999,342**

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Overview

Private Real Estate Program Summary By Fund as of 9/30/2016

Deal #	Fund Name	ERS FY	Commitment Date	Capital Committed	Capital Called	Distributions	Market Value
1	LaSalle Property Fund	2010	January-10	$100,000,000			
2	Cornerstone Core Mortgage Fund	2010	May-10	$36,300,000			
3	TIAA CREF Asset Management Core Property Fund	2011	September-10	$125,000,000			
4	Madison International Real Estate Liquidity Fund IV	2011	October-10	$60,000,000			
5	Invesco Core Real Estate	2011	January-11	$100,000,000			
6	Texas ERS Private Real Estate Emerging Manager I, LP	2011	December-10	$50,000,000			
7	Waterton Residential Property Venture XI	2011	February-11	$100,000,000			
8	M&G Real Estate Debt Fund LP*	2011	June-11	$39,200,000			
9	Prudential US Real Estate Debt Fund	2011	July-11	$125,000,000			
10	Private Real Estate Emerging Manager I-Abacus	2012	January-12	$20,000,000			
11	Aberdeen European Opportunities Property Fund of Funds, LLC*	2012	February-12	$95,200,000			
12	Private Real Estate Emerging Manager I-Exeter	2012	May-12	$20,000,000			
13	Prologis Targeted U.S. Logistics	2012	April-12	$125,000,000			
14	Rockpoint Real Estate Fund IV, LP	2012/13	March-12 & March-13	$137,500,000			
15	Latitude Management, Real Estate Capital III	2012/13	August-12 & August-13	$100,000,000			
16	Northwood Real Estate Partners, LP	2012	August-12	$50,000,000			
17	KTR Industrial Fund III	2013	November-12 & August-13	$120,000,000			
18	Madison International Real Estate Liquidity Fund V	2013	December-12	$80,000,000			
19	Brookfield Strategic Real Estate Partners B LP	2013	August-13	$60,000,000			
20	M&G Real Estate Debt Fund II LP*	2013	May-13	$58,500,000			
21	Prologis European Properties Fund II*	2013/14	August-13 & September-13	$51,520,000			
22	Lone Star Real Estate Fund III	2014	September-13	$70,000,000			
23	Torchlight Debt Opportunity Fund IV LLC	2014	October-13	$35,000,000			
24	Orion European Real Estate Fund IV*	2014	November-13	$67,200,000			
25	Pennybacker Fund III	2014	December-13	$15,000,000			
26	Invesco Real Estate Asia Fund	2014/15/16	Jan-14, Feb-15, & Sep-15	$50,000,000			
27	Campus-Clarion Student Housing Partners, LP	2014	February-14	$65,000,000			
28	Hammes Partners II, L.P.	2014	February-14	$50,000,000			
29	Wheellock Street Capital Fund II, LP	2014	April-14	$47,000,000			
30	True North Real Estate Fund III LP	2014/15	May-14 & August-15	$100,000,000			
31	DRA Growth & Income Fund VIII, LLC	2014	June-14	$50,000,000			
32	Abacus Multi-Family Partners III LP	2015	December-14	$50,000,000			
33	Rockpoint Real Estate Fund V LP	2015	January-15	$100,000,000			
34	Waterton Residential Property Venture XII	2015	January-15	$75,000,000			
35	U.S. Self Storage Value Fund I, LLC	2015	February-15	$50,000,000			
36	BPE Asia Real Estate	2015	March-15	$75,000,000			
37	Brookfield Strategic Real Estate Partners II LP	2015	March-15	$75,000,000			
38	SRE Opportunity Fund II, L.P.	2015	April-15	$15,000,000			
39	AMFP II Bartz Co-Invest	2015	July-15	$5,800,075			
40	Horizon MH Communities Fund I, LP	2016	September-15	$35,000,000			
41	Alliance Co-Investment, LP	2016	November-15	$15,000,000			
42	Madison NYC Core Retail Partners, LP	2016	December-15	$20,000,000			
43	Aviva Inv Re Cap Global Co-Investment	2016	January-16	$60,000,000			
44	ERS Private Real Estate Emerging Manager II, L.P.	2016	January-16	$50,000,000			
45	Xander Investment Management Pte Ltd.	2016	February-16	$50,000,000			
Total				**$2,878,220,075**	**$2,273,502,262**	**$1,274,237,784**	**$1,728,999,342**

*Amounts in USD as of report date.

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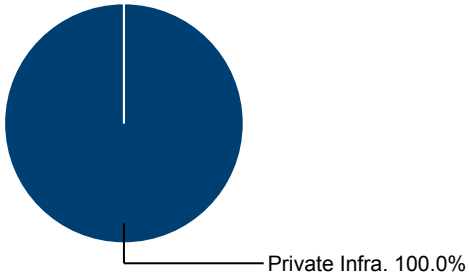
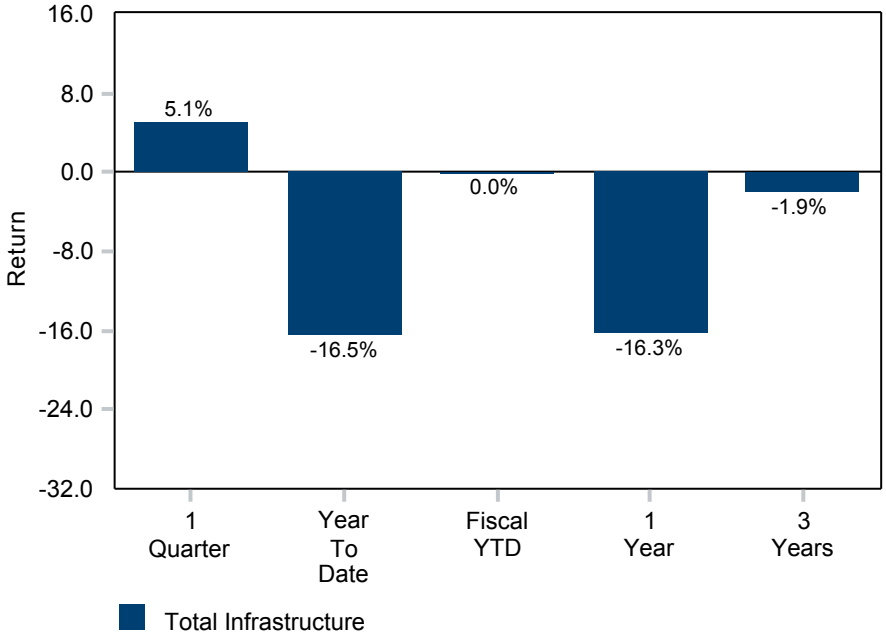
Infrastructure Portfolio Overview

Current Allocation
September 30, 2016 : $349M



Return Summary[1]



[1] Includes returns from Public Infrastructure through 6/30/15.

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Overview

	Internal Rate of Return(%)		
	1 Year	3 Years	Since Inception
Private Infrastructure	-14.7	-5.0	-0.7

Private Infrastructure Program Summary by Fiscal Year as of 9/30/2016

ERS FY	# of Deals	Capital Committed	Capital Called	Distributions	Market Value
2012	1	$70,000,000	$70,000,000	$0	$53,023,000
2013	2	$205,000,000	$148,239,920	$3,297,944	$156,957,730
2015	2	$105,000,000	$57,435,598	$10,675,346	$42,810,566
2016	2	$177,100,000	$100,763,287	$8,046,027	$95,875,419
2017	1	$100,000,000	$0	$0	$0
Total	**8**	**$657,100,000**	**$376,438,805**	**$22,019,317**	**$348,666,715**

Private Infrastructure Program Summary By Fund as of 9/30/2016

Deal #	Fund Name	ERS FY	Commitment Date	Capital Committed	Capital Called	Distributions	Market Value
1	Infrastructure Co-Investments 2012	2012	Various	$70,000,000			
2	Infrastructure Co-Investments 2013	2013	Various	$130,000,000			
3	Actis Energy 3 R L.P.	2013	August-13	$75,000,000			
4	ISQ Global Infrastructure Fund	2015	January-15	$75,000,000			
5	Infrastructure Co-Investments 2015	2015	Various	$30,000,000			
6	Infrastructure Co-Investments 2016	2016	Various	$109,100,000			
7	Stonepeak Infrastructure Fund II, LP	2016	November-15	$68,000,000			
8	Infrastructure Co-Investments 2017	2017	Various	$100,000,000			
Total				**$657,100,000**	**$376,438,805**	**$22,019,317**	**$348,666,715**

*The Market Values above do not include adjustments between September 30, 2016 and the preparation date of this report.
*The IRRs above include all adjustments effective September 30, 2016 that were received from the general partners by the time this report was prepared.

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Rates

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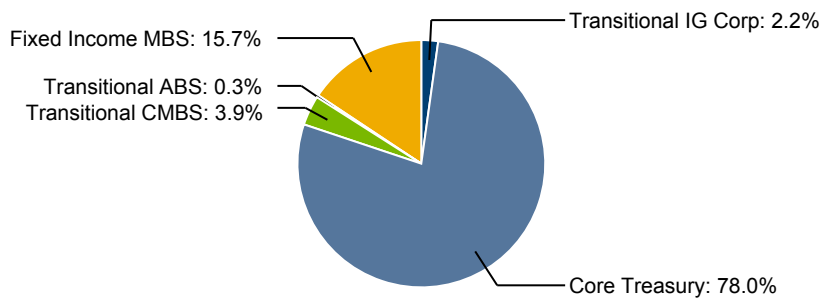
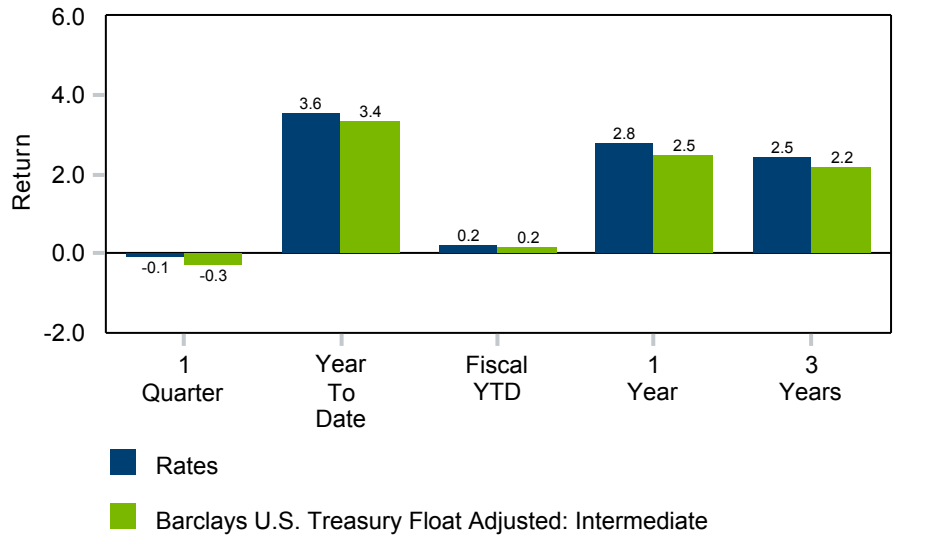
As of September 30, 2016

Total Rates Portfolio Overview

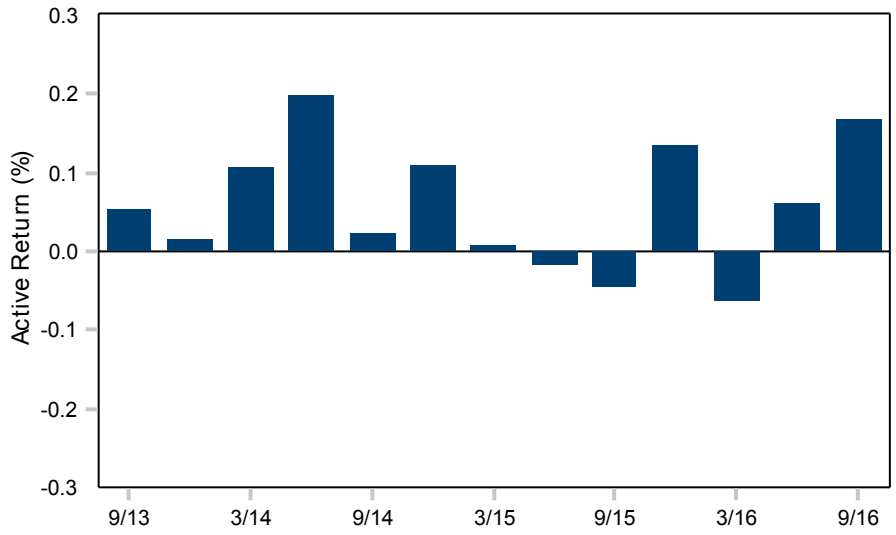
Current Allocation
September 30, 2016 : $4,079M



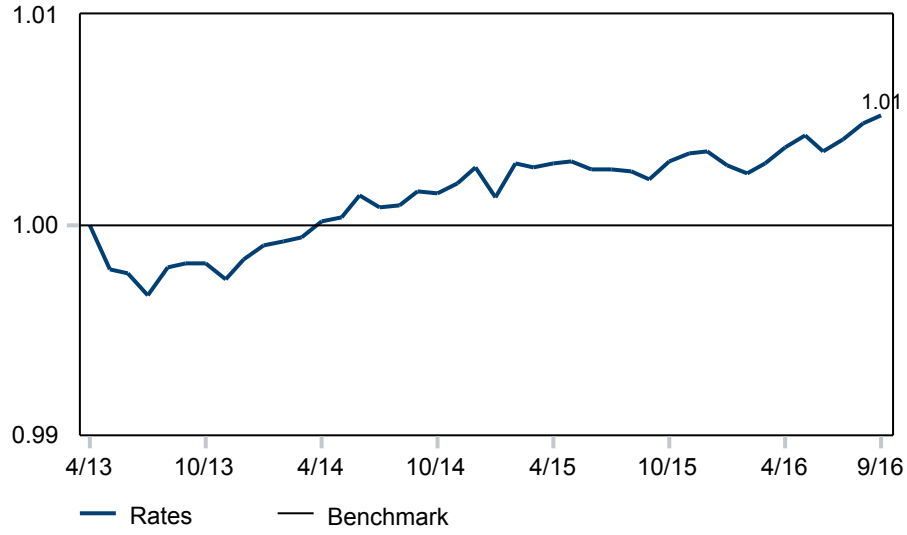
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



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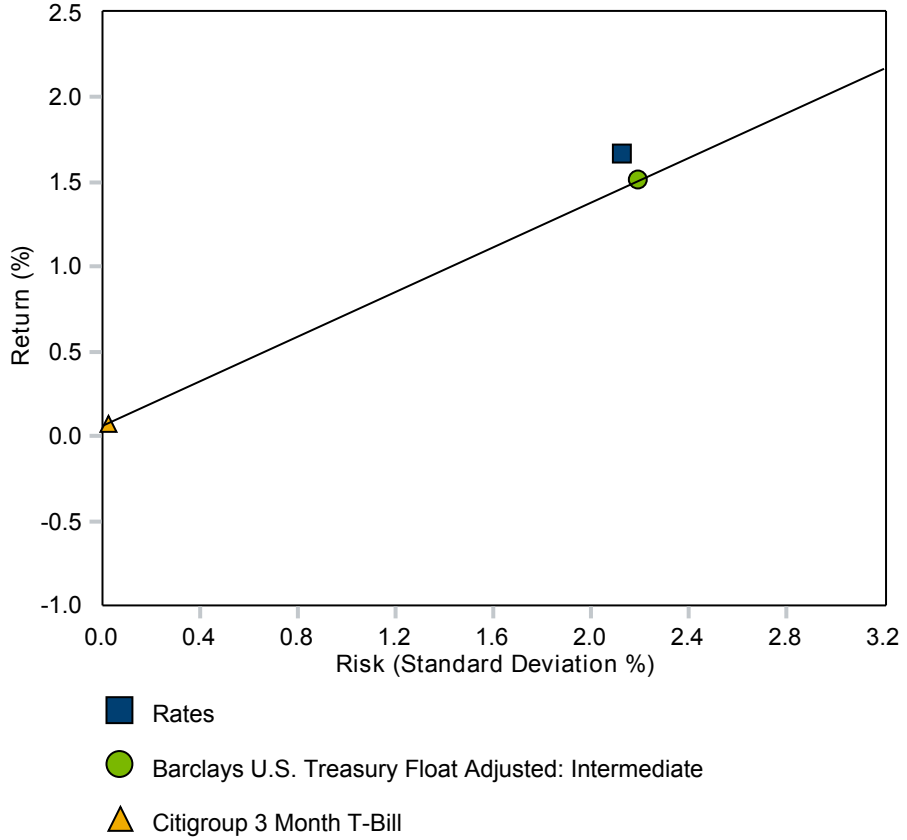
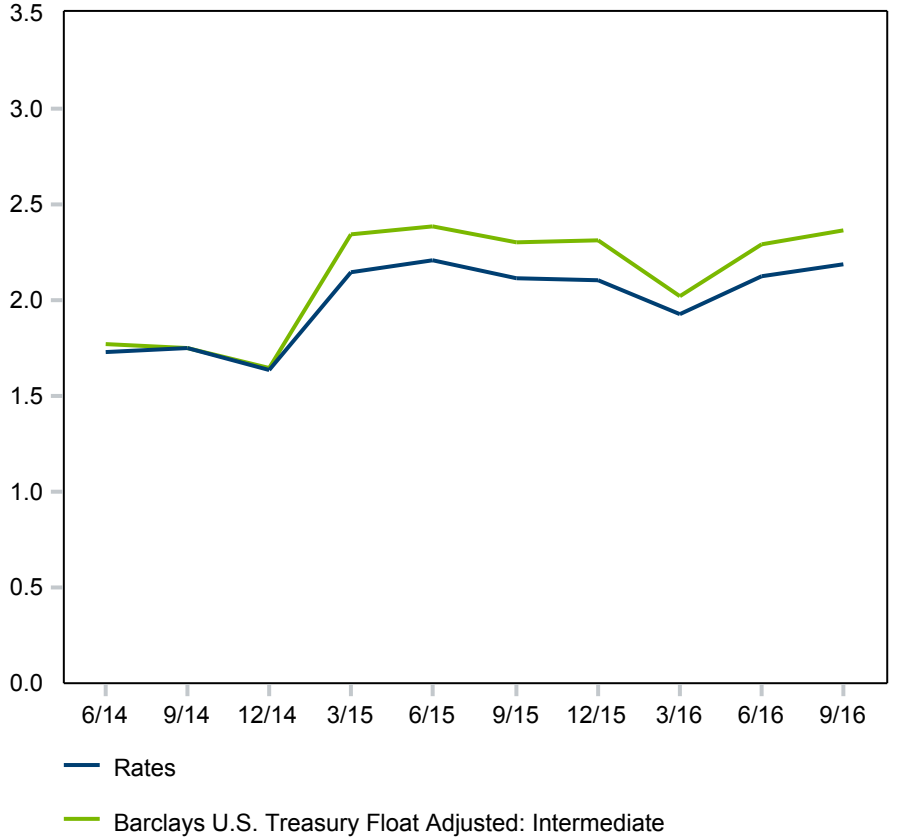
Rates Risk Profile

Annualized Return vs. Annualized Standard Deviation Since 5/1/2013



Rolling 1 Year Standard Deviation



Historical Statistics Since 5/1/2013

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Rates	0.15	0.25	0.60	0.99	0.75	0.21	0.96	1.66	2.13	0.99
Barclays U.S. Treasury Float Adjusted: Intermediate	0.00	0.00	N/A	1.00	0.66	0.00	1.00	1.50	2.20	1.00
Citigroup 3 Month T-Bill	-1.44	2.20	-0.66	0.00	N/A	0.08	0.00	0.08	0.03	0.07

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Absolute Return

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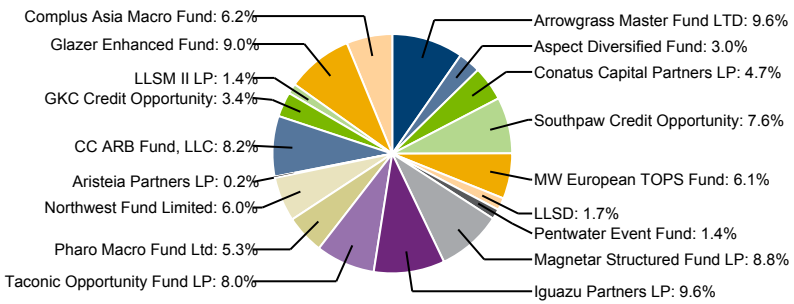
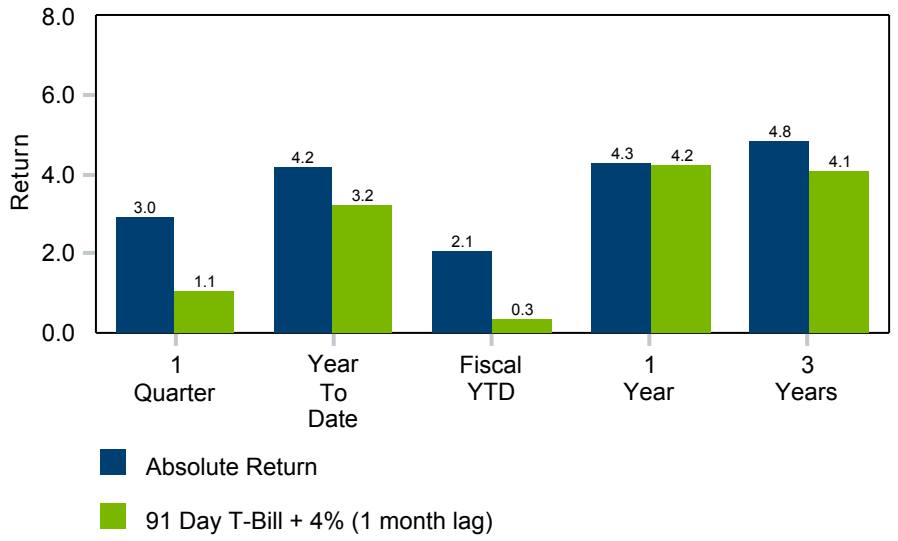
Absolute Return Portfolio Overview

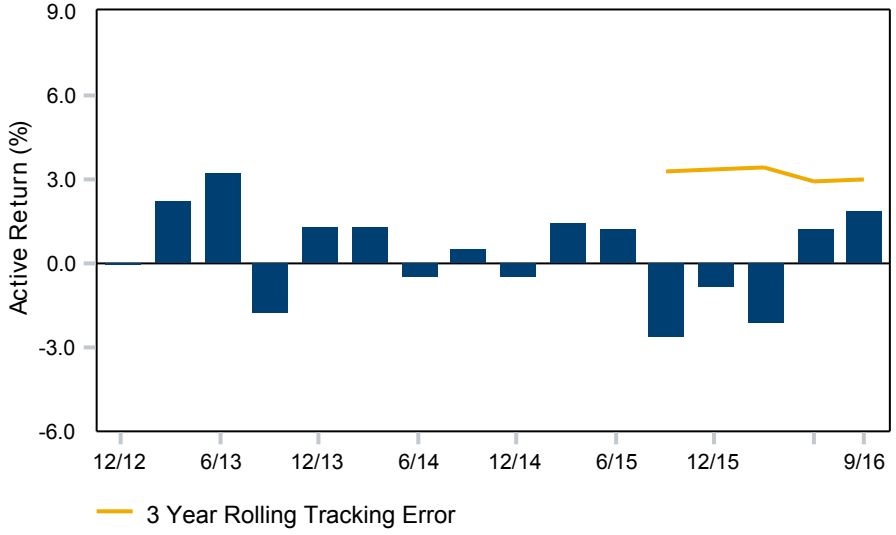
Current Allocation
September 30, 2016 : $1,289M



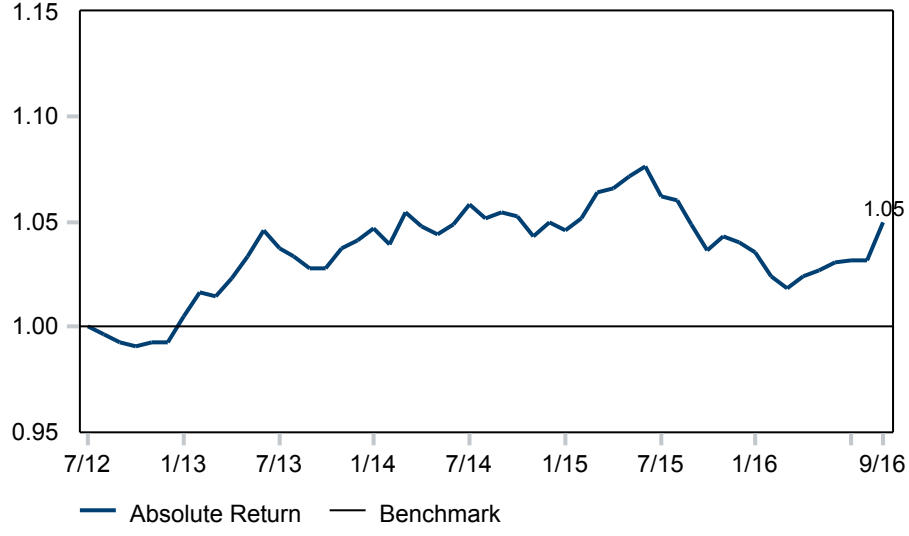
Return Summary



Quarterly Excess Performance



Ratio of Cumulative Wealth - Since Inception



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Definitions

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Statistics Definition

Statistics		Definition
Active Return	-	Arithmetic difference between the managers return and the benchmark return over a specified time period.
Actual Correlation	-	It is a measure of the correlation (linear dependence) between two variables X and Y, giving a value between +1 and -1 inclusive. It is widely used in the statistics as a measure of the strength of linear dependence between two variables. Also called coefficient of correlation.
Alpha	-	A measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. It is a measure of the portfolio's historical performance not explained by movements of the market, or a portfolio's non-systematic return.
Beta	-	A measure of the sensitivity of a portfolio to the movements in the market. It is a measure of a portfolio's non-diversifiable or systematic risk.
Information Ratio	-	Measured by dividing the active rate of return by the tracking error. The higher the Information Ratio, the more value-added contribution by the manager.
R-Squared	-	The percentage of a portfolio's performance explained by the behavior of the appropriate benchmark. High R-Square means a higher correlation of the portfolio's performance to the appropriate benchmark.
Return	-	Compounded rate of return for the period.
Sharpe Ratio	-	Represents the excess rate of return over the risk free return divided by the standard deviation of the excess return. The result is the absolute rate of return per unit of risk. The higher the value, the better the product's historical risk-adjusted performance.
Standard Deviation	-	A statistical measure of the range of a portfolio's performance, the variability of a return around its average return over a specified time period.
Tracking Error	-	A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.

Appendix

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Total Fund Benchmark 9/30/2016

Total Fund Policy Benchmark		
Asset Class	Policy Index	Weight
Global Public Equity	MSCI All Country World IMI Index	47.6%
Global Private Equity	MSCI All Country World IMI Index Plus 300 BPS	10.0%
Global Credit	Barclays U.S. High Yield 2% Issuer Cap Index	8.0%
Public Real Estate	FTSE EPRA/NAREIT Developed Net	3.0%
Private Real Estate	NCREIF ODCE Net Index (1 month lag)	7.0%
Private Infrastructure	Actual Return	1.4%
Rates	Barclays Intermediate Treasury Index	17.0%
Absolute Return	90 Day T-bill + 4% (1 month lag)	5.0%
Cash	Merrill Lynch 3 Month Treasury Bill	1.0%
Total		100.0%

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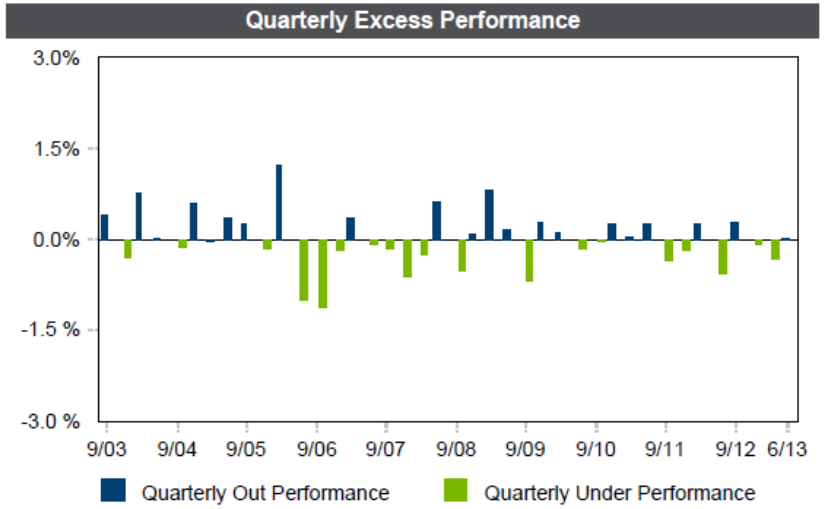
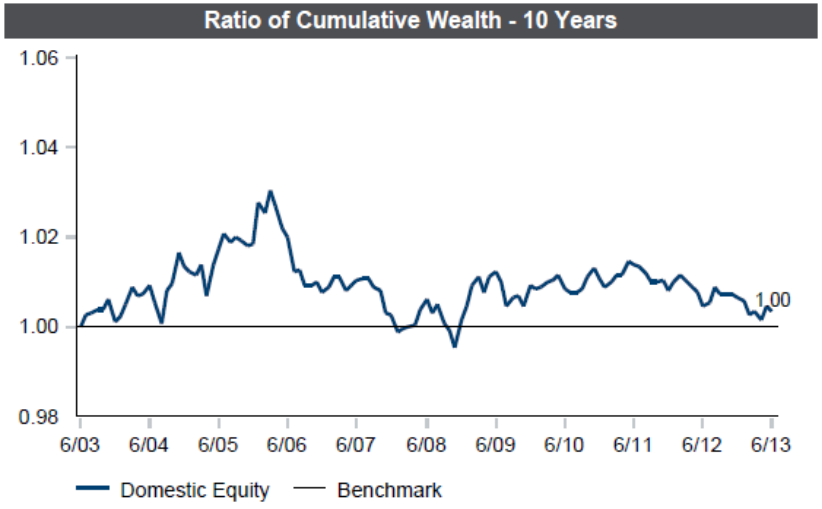
EXPLANATION OF EXHIBITS

Quarterly and Cumulative Excess Performance - The vertical axis, excess return, is a measure of fund performance less the return of the primary benchmark. The horizontal axis represents the time series. The quarterly bars represents the underlying funds relative performance for the quarter. The ratio of cumulative wealth represents the fund's cumulative relative performance versus its primary benchmark. An upward-sloping line indicates superior fund performance versus its benchmark. Conversely, a downward-sloping line indicates underperformance by the fund. A flat line is indicative of benchmark-like performance.





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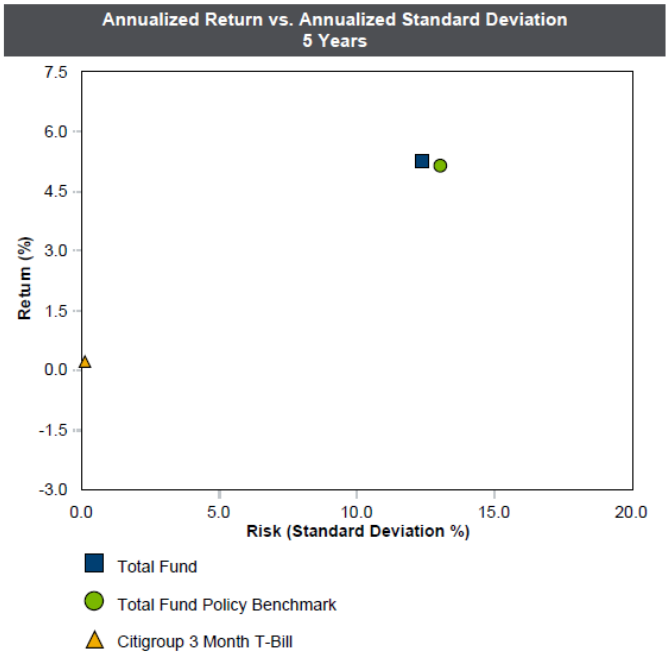
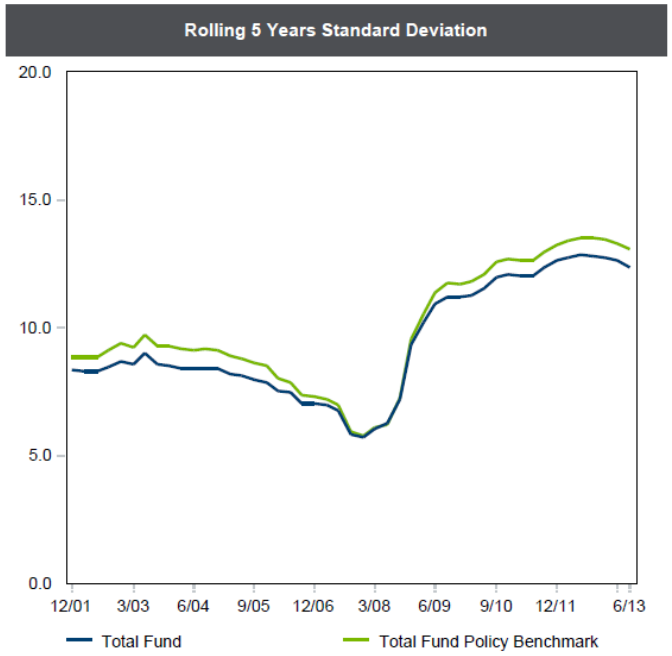
Risk-Return Graph - The horizontal axis, annualized standard deviation, is a statistical measure of risk, or the volatility of returns. The vertical axis is the annualized rate of return. As investors generally prefer less risk to more risk and always prefer greater returns, the upper left corner of the graph is the most attractive place to be.

Rolling 5 Years Standard Deviation - The vertical axes measures standard deviation for the 5 year period prior to the corresponding time series date on the horizontal axis for both a fund and its respective benchmark.

Total Fund Risk Profile





5 Years Historical Statistics

	Active Return	Tracking Error	Information Ratio	R-Squared	Sharpe Ratio	Alpha	Beta	Return	Standard Deviation	Actual Correlation
Total Fund	0.01	0.86	0.02	1.00	0.46	0.34	0.95	5.24	12.38	1.00
Total Fund Policy Benchmark	0.00	0.00	N/A	1.00	0.43	0.00	1.00	5.13	13.08	1.00
Citigroup 3 Month T-Bill	-5.66	13.12	-0.43	0.14	N/A	0.25	0.00	0.23	0.12	-0.37

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Appendix

Total Fund	**Total Fund Policy Benchmark** is currently comprised of the MSCI All Country World IMI, MSCI AC World IMI Index Plus 300 basis points, Barclays US High Yield 2% Issuer Cap, FTSE EPRA/NAREIT Blend, NCREIF ODCE NET (1 month in arrears), Barclays Intermediate Treasury, BofA Merrill Lynch 3 Month Treasury Bill + 4% (lagged 1 month), BofA Merrill Lynch 3 Month Treasury Bill, and actual returns for Private Infrastructure.
Universe	**Universe** - The rankings are based on a universe of 68 total public pension plans with greater then $1.0 billion in assets compiled by BNY Mellon Performance & Risk Analytics.
Global Equity	**MSCI All Country World Index** - A capitalization-weighted index of stocks representing 46 stock markets in Europe, Australia, the Far East, the Middle East, Latin America and North America.
Global Public Equity	**Global Public Equity Benchmark –** The benchmark consists of the S&P 1500 and MSCI ACWI ex U.S. using actual portfolio weights until 8/31/14, the MSCI All Country World Index until 8/31/15 and the MSCI All Country World IMI Index thereafter.
Domestic Equity	**Domestic Equity Benchmark** - The benchmark consists of the S&P 500 until 8/31/08 and the S&P 1500 Index thereafter. The S&P 1500 Index is a combination of the S&P 500, S&P MidCap 400, and S&P SmallCap 600 indices, and represents 85% of the total U.S. stock market.
ERS S&P 500 Index Fund & ERS Large Cap Core	**S&P 500 Stock Index** - A capitalization-weighted index representing stocks chosen by Standard & Poor's, Inc. for their size, liquidity, stability and industry group representation. The companies in the S&P 500 Index are generally among the largest in their industries.
Large Cap Growth Quant	**S&P 500/Citigroup Growth Index** - An index of approximately 286 stocks in the S&P 500 Index covering all pure growth stocks and the growth distribution of those having both growth and value characteristics
Barrow Hanley Mewhinney & Strauss	**S&P 500 Value Index**- A capitalization-weighted index representing publicly traded U.S. value stocks. Value is determined by the stocks' book value to price ratio, sales to price ratio and dividend yield.
ERS Mid Cap Core	**S&P Mid Cap 400 Index** - A market-capitalization-weighted index of stocks in all major industries in the mid-range of the U.S. stock market.
ERS Small Cap Core	**S&P 600 Index** - Focuses on the small-cap segment of the market, including companies from a variety of different sectors/industries. In order for a stock to be added to the S&P 600 Index, it must be a U.S. company, have adequate liquidity and reasonable per-share price, and have a market cap of $300 million to $1 billion.
Emerging Manager Composite	**S&P 1500 Index** is a combination of the S&P 500, S&P MidCap 400, and S&P SmallCap 600 indices, and represents 85% of the total U.S. stock market.
International Equity	**International Equity Benchmark-** The Benchmark consists of the MSCI EAFE Net January 1999 through August 2008 and the MSCI ACWI ex US Net thereafter. **MSCI All Country World ex-U.S. Index** - A capitalization-weighted index consisting of 22 developed and 23 emerging countries, but excluding the U.S. Covers approximately 85% of global equity opportunity set outside of the U.S.
ERS International EAFE Composite	**MSCI EAFE Index** - An equity index which captures large and mid cap representation across 21 Developed Markets countries around the world, excluding the US and Canada. With 900 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

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ERS Canada	**MSCI Canada** - A market capitalization-weighted index that captures broad Canadian equity market coverage including over 680 constituents across large, mid, small and micro capitalizations. The index covers approximately 85% of the free float-adjusted market capitalization in Canada.
Fisher Investments	**Fisher Performance Benchmark -** The benchmark consists of the MSCI EAFE Net from July 2006 through September 2008 and MSCI ACWI ex US Net thereafter. **MSCI All Country World ex-U.S. Index** - A capitalization-weighted index consisting of 22 developed and 23 emerging countries, but excluding the U.S. Covers approximately 85% of global equity opportunity set outside of the U.S.
Templeton	**Templeton Performance Benchmark-** The benchmark consists of the MSCI EAFE Net from April 2003 through September 2008 and MSCI ACWI ex US Net thereafter. **MSCI All Country World ex-U.S. Index** - A capitalization-weighted index consisting of 22 developed and 23 emerging countries, but excluding the U.S. Covers approximately 85% of global equity opportunity set outside of the U.S.
Lazard Asset Management	**MSCI EAFE Index** - An equity index which captures large and mid cap representation across 21 Developed Markets countries around the world, excluding the US and Canada. With 900 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.
Blackrock International Focus	**MSCI All Country World ex-U.S. Index** - A capitalization-weighted index consisting of 22 developed and 23 emerging countries, but excluding the U.S. Covers approximately 85% of global equity opportunity set outside of the U.S.
ERS Emerging Markets	**MSCI Emerging Markets Index** - A capitalization-weighted index of stocks representing 23 Emerging Markets. With 833 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.
Total Global Credit	**Barclays U.S. High Yield - 2% Issuer Cap-** An index comprising US corporate, fixed-rate, noninvestment-grade debt with at least one year to maturity and at least $150 million in par outstanding. Index weights for each issuer are capped at 2%.
ETF Fixed Income Emerging Markets	**ETF Fixed Income EM Performance Benchmark-** The benchmark consisted of the Barclays Emerging Market from July 2012 through August 2013 and the Barclays U.S. Corporate High Yield 2% Issuer Capped thereafter.
ETF Fixed Income High Yield	**Barclays U.S. High Yield 2% Issuer Cap-** The Benchmark consists of the Barclays U.S. High Yield from July 2012 through August 2013, and the Barclays U.S. High Yield 2% Issuer Capped thereafter.
Private Credit	**Barclays U.S. High Yield 2% Issuer Cap (1 month lag)-** An index comprising US corporate, fixed-rate, noninvestment-grade debt with at least one year to maturity and at least $150 million in par outstanding. Index weights for each issuer are capped at 2%.

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Real Estate	**The benchmark** consists of the FTSE EPRA/NAREIT Global Index through August 31st, 2010 and a combination of the Global Real Estate Performance Benchmark and the return of the Private Real Estate subsequent to August 31, 2010.
Global Public Real Estate	**Public Real Estate Performance Benchmark-** consists of the MSCI REIT from March 2005 - March 2007, a floating weight benchmark comprised of the EPRA/NAREIT US and EPRA/NAREIT US Global ex US from April 2007 through December 2007, the EPRA NAREIT Global Index from January 2008 through August 2013, the FTSE EPRA/NAREIT Developed Net from September 2013 through August 2014, and a MV weighted blend of the Total Internal Public RE Benchmark and the Wells St. Partner custom benchmark from September 2014 through March 2016. Effective April 2016, the benchmark is 100% FTSE EPRA/ NAREIT Developed Net.
Private Real Estate	**Private RE Performance Benchmark** - consists of the 91 Day T-Bill + 4% RE benchmark from 9/1/2012 through 8/31/14 and the NCREIF NFI-ODCE Net 1 month lagged beginning 9/1/14.
Internal Public Real Estate	**Public Real Estate Performance Benchmark**- The benchmark consists of the MSCI REIT from March 2005 - March 2007, a floating weight benchmark comprised of the EPRA/NAREIT US and EPRA/NAREIT US Global ex US from April 2007 through December 2007, the EPRA NAREIT Global Index from January 2008 through August 2013, and the FTSE EPRA/NAREIT Developed Net thereafter
Domestic REIT	**Domestic REIT Performance Benchmark-** The benchmark consists of the MSCI REIT from May 2000 - March 2007 and the FTSE EPRA/NAREIT thereafter. FTSE NAREIT Index - Includes all tax-qualified equity real estate investment trusts (REITs) meeting certain size and liquidity criteria that are listed on the New York Stock Exchange, the American Stock Exchange or the NASDAQ National Market List. Equity REITs include those firms that own, manage and lease investment-grade commercial real estate. Specifically, a company is classified as an Equity REIT if 75% or more of its gross invested book assets is invested in real property.
International REIT	**FTSE EPRA NAREIT Global ex-U.S. Index** - Designed to represent general trends in eligible real estate equities worldwide. Relevant real estate activities are defined as the ownership, disposure and development of income-producing real estate.
Total Rates	**Barclays Intermediate Treasury Index-** Consists of fixed-rate debt securities with maturities from one up to (but not including) 10 years from the U.S. Government Bond indices.
Absolute Return	**91 Day T-Bill +4% (1 month lag)**- The benchmark consists of the 91 Day T-Bill + 4% through 8/31/14 and the 91 Day T-Bill + 4% 1 month lagged beginning 9/1/14.

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AHIC Thought Leadership Highlights

White Papers	
All Investors: Global Invested Capital Market	Link
All Investors ex-DC: Fallen Angels - Capitalizing Upon an Attractive Segment of the High Yield Market	Link
All Investors ex-DC: Risk Parity – Looking at Risk Through a Different Lens	Link
DB & DC: Hot Topics in Retirement and Financial Well-Being	Link
DB & DC: Real Deal Study	Link
Private DB: Pension Funding Strategy: Considerations for Prefunding a Pension Plan	Link
DC: If You Offer It, Participants Will Use It (Roth Usage in DC Plans)	Link
DC: Final Fiduciary Regulations – Overview for Plan Sponsors	Link
Oil and Gas Industry: Oil and Gas Retirement Benchmarking Reports	Link
Healthcare Industry: Redefining Retirement in the Health Care Industry (Part Five of Five Part Series)	Link

Current Topics of Interest	
Private DB: Life Expectancy Assumptions for Pension Plans – More Volatility Ahead?	Link
Private DB: U.S. Corporate Pension Liability Hedging Views	Link
DC: 2016 Universe Benchmarks – Research Highlights	Link
DC: Capital Preservation in DC Plans Deserves a Second Look	Link

Aon Hewitt Retirement and Investment Blog
https://retirementandinvestmentblog.aon.com/

Events	
Replay recent webinars or find information on the upcoming webinar “What Are Your Employees Thinking? Understanding the Financial Mindset”	Link

Disclaimers and Notes

Disclaimers:

§ Please review this report and notify Aon Hewitt Investment Consulting (AHIC) with any issues or questions you may have with respect to investment performance or any other matter set forth herein.

§ The client portfolio market value data presented in this report has been obtained from the custodian. AHIC has compared this information to the investment managers' reported returns and believes the information to be accurate. AHIC has not conducted additional audits and cannot warrant its accuracy or completeness.

§ The mutual fund information found in this report is provided by Lipper Inc. and AHIC cannot warrant its accuracy or timeliness.

§ Russell Investment Group is the source and owner of the trademarks, service marks and copyrights related to the Russell Indexes. Russell® is a trademark of Russell Investment Group.

§ The Greenwich Quality Leaders Awards are based on quality ratings provided by clients of investment consultants and asset managers. Between July and October 2015, Greenwich Associates conducted 1,341 interviews with senior professionals at corporate and union funds, public funds, endowments and foundations, insurance general accounts, and healthcare organizations with either pension or investment pool assets greater than $150 million. Study participants were asked to provide quantitative and qualitative evaluations of their investment consultants. Based on those responses, Greenwich Associates calculates a score on the Greenwich Quality Index• for each consultant named. Consultants with scores that top those awarded to competitors by a statistically significant margin are named Greenwich Quality Leaders. Visit the Greenwich Associates website (https://www.greenwich.com/asset-management/leading-investment-consultants-form-deep-advisory-relationships) to read a copy of the full report and to learn more about the methodology.

Notes:

§ The rates of return contained in this report are shown on an after-fees basis unless otherwise noted. They are geometric and time weighted. Returns for periods longer than one year are annualized.

§ Universe percentiles are based upon an ordering system in which 1 is the best ranking and 100 is the worst ranking.

§ Due to rounding throughout the report, percentage totals displayed may not sum up to 100.0%. Additionally, individual fund totals in dollar terms may not sum up to the plan totals.

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PUBLIC AGENDA ITEM - #6*

6. Review and Discussion of the Risk Management and Applied Research Program

December 1, 2016

BACKGROUND

Milton Friedman was famous for saying "There's no such thing as a free lunch" (a phrase that he did not claim to originate). The phrase is as true in capital markets as it is in government policy. High-return but low-risk investments are as unlikely as $3 filet mignon. The job of the Risk Management and Applied Research team (RMAR) is to help the Trust earn the best return it can for a given level of risk—and, to extend the lunch metaphor, to minimize the risk of food poisoning. (In a word, don't buy the $3 filet.)

Investing in the capital markets as a way to generate returns and grow the assets of the plan brings with it the notion of uncertainty as to the expected rate of returns to be earned. This uncertainty is usually associated with the sensitivity of the capital markets to broad economic events. When the economy is doing well, risky assets tend to do well. But when the economy suffers from high inflation or goes into recession, in general risky assets do not do that well. Under this scenario riskless assets such as short-term bonds become the asset of choice. This ebbing and flowing of the economy causes the price of financial instruments to fluctuate. For example, riskier assets such as equities will fluctuate more than short-term bonds. The higher level of price fluctuation in the riskier asset (we refer to this price fluctuation as volatility) is typically associated with higher expected returns whereas less risky assets are associated with lower expected returns. The standard deviation, a statistical measure of dispersion around a mean, is the measure that is traditionally used to gauge market risk.

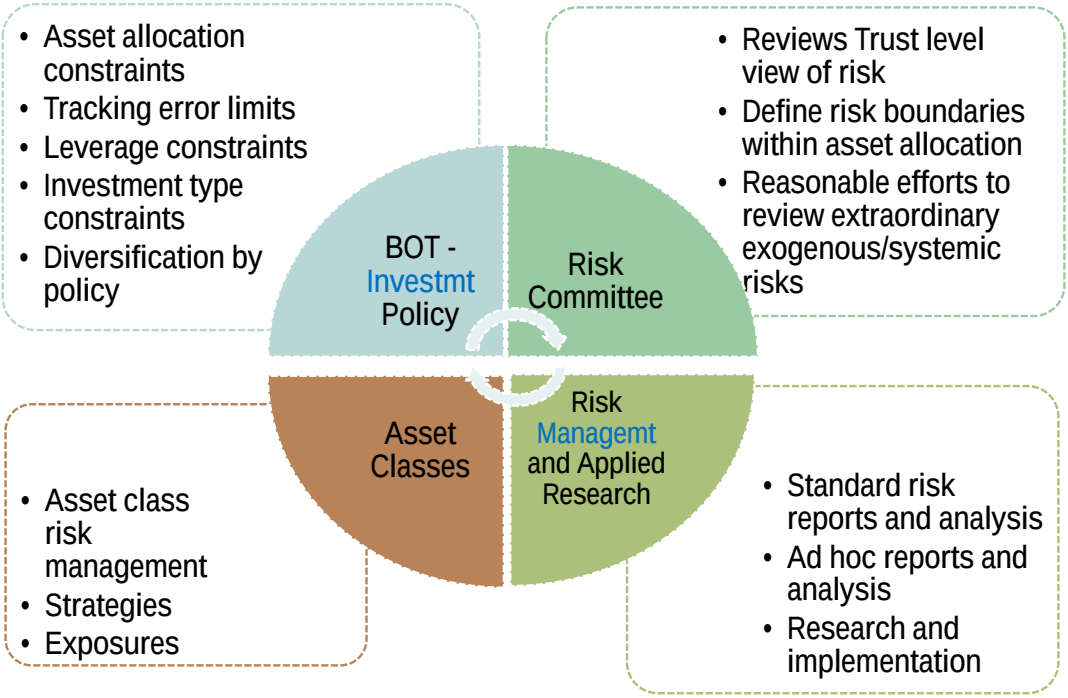
While riskier assets are associated with higher expected returns, they also increase the possibility of large negative returns. In order to mitigate this risk, investors will manage their portfolios so that this risk is diversified away as much as possible. They will do so by holding diverse assets that do not move together at all times.

While all investment professionals at ERS are responsible for managing risk within their assigned portfolios, the Risk Management and Applied Research Team is charged with the responsibility to help monitor, measure and manage risk at the plan level. The purpose of risk monitoring and risk management within the Investments division is to identify uncertainties that could make the greatest difference to Trust Fund performance, and then measure, monitor and manage those risks. For this endeavor, the Trust employs a Risk Committee and the RMAR Team to consider relevant information and recommend actions that will either strive to avoid negative outcomes or enhance positive outcomes. A second, but equally important, function is to assure that the risk constraints established by the ERS Board of Trustees (Board) in the ERS *Investment Policy* are being observed.

While risk monitoring and risk management takes place at all levels of the Investment Program, Asset Class Directors and Portfolio Managers are keenly aware of the risks they are taking; they are given latitude to prudently take risks they believe are appropriate and will enhance performance within the guidelines of the ERS *Investment Policy*. In this regard, the asset classes have specialized methods and tools to help managers identify risks and make informed decisions.

The diagram below depicts the continuous nature of the risk management process at ERS. The different components of the process are not independent. Establishing appropriate Investment Policy constraints, such as tracking error limits in the Active Risk Budget and limitations on the use of leverage, lead directly to specific monitoring requirements. What is monitored and how it is measured drive the analytical process. The analytical process also requires a strong theoretical basis and appropriately applied statistical techniques to produce applicable information.

** We are accredited by the State Pension Review Board (PRB) as a Minimum Educational Training (MET) sponsor for Texas public retirement systems. This accreditation does not constitute an endorsement by the PRB as to the quality of our MET program. These agenda items may be considered in-house training provided by ERS to board trustees and the system administrator for purposes of fulfilling the MET program requirements. ERS is an accredited sponsor of MET for its system administrator and trustees.*



Asset Class and Trust Overview

The exhibit that follows shows the aspects of risk that are monitored at the asset class level and, when relevant, at the Trust level.

It is evident that risk analysis is fairly comprehensive. Nevertheless, the three highlighted areas (noted by the "X"s) are a work in progress. These areas affect the plan at the Trust level and are associated with Sector/Factor Risk, Financial Leverage and Counterparty risk.

With respect to Sector/Factor Risk, this is one area that the team has identified as an area of focus for the upcoming year with initial discussions already begun. Currently, Financial Leverage is monitored at the asset class level by each of the Asset Class Directors. Each Asset Class Director is responsible for monitoring financial leverage in accordance with their stated policy statements. At present, the plan has no intentional financial leverage at the Trust Level but this could change in the future with a more active derivatives program. Lastly, the only counterparty risk that the plan has comes from the plan's security lending program. In this regard, the Director of Fixed Income has kept constant vigilance on the evolution of that program, has provided frequent updates and opined on recommended actions to members of the Risk Committee. Counterparty risk at the asset class level is monitored by each of the Asset Class Directors.

Asset Class and Trust Risk Monitoring

	Asset Allocation	Active Risk	Tail Risk	Sector/Factor Risk	Currency	Stress Test	Financial Leverage	Derivatives	Counterparty	Liquidity
Global Equity										
Public Equity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Private Equity	✓			✓	✓		✓		✓	
Fixed Income										
Global Credit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rates	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cash	✓				✓				✓	✓
Real Assets	✓	✓		✓	✓		✓		✓	✓
Absolute Return	✓	✓	✓	✓		✓	✓		✓	✓
Overall Trust	✓	✓	✓	✗	✓	✓	✗	✓	✗	✓

✓ risk is currently measured and monitored
✗ Tools and standards under development
not currently monitored or available

Risk Management and Applied Research Team

One of the responsibilities of the RMAR team is to monitor plan wide investment risk. The RMAR team performs this activity according to the following process. First, on a monthly basis, the RMAR team publishes two main sets of analytical reports. The Asset Class Report is a top level report that is meant to provide a 'big picture' of the plan from a performance and risk standpoint. At a more granular level, the team publishes a similar report at the portfolio level. This second report is referred to as the Portfolio Overview Report. These two sets of reports are distributed before Risk Committee meetings take place to all members of the committee. Second, the RMAR team provides updates at the trust level and of current market conditions. It is standard practice that the RMAR team provides a summary of findings and a review of cross asset class stress levels. To the extent that there is a need to address a particular topic, the RMAR team or a designated asset class head will address the risk committee.

Refining and expanding the set of the analytical tools is an integral part of the RMAR team. As such, over the past year, a great deal of time and effort was dedicated to improving the set of analytics. These improvements included adding analysis on:

a. Performance attribution and relative active risk attribution
b. A section on dollars invested by asset class and by region and country
c. A more clearly defined framework for liquid vs non liquid assets
d. Incremental improvements related to rolling statistics such as beta and tracking error

Another important area of focus for the RMAR team was to develop an analytical framework for the use of equity derivatives for global public equities. There were three interrelated aspects to this work:

1.) The team developed a process to generate equity options ideas using a relative volatility framework. The RMAR team authored a custom software application to promote call overwriting and put underwriting ideas on the domestic large cap, midcap and small cap S&P indices. The application provides an overview of how options are priced on selected international equity markets, how demand for protective puts look relative to demand for upside participation call options and how volatility is priced over multiple investment horizons. The application then provides the top 20 best ideas for call and put ideas for the above mentioned indices. In order to expand the research capability of the internal public equity team, the RMAR team designed a tool that enables them to monitor their own set of stocks and generate options ideas from that list.

2.) In conjunction with the Chicago Board Options Exchange ("CBOE"), the RMAR team published a research paper on how to improve risk-adjusted returns on a commonly referred allocation of 60% stocks/40% bonds using options-based strategies.

3.) Based on the research for the CBOE paper and the previously developed library of quantitative fundamental factors, the team constructed options strategies to overlay on the recently-launched Tactical Quantitative equity portfolio, which also utilizes the factor library.

In addition, the team developed a tool for the equity team that enables a disciplined evaluation of companies' financial ratios. This tool leverages the quantitative library of fundamental factors that has been developed over the past decade, updated with a new set of factors and refined to be more focused on sector, industry and stock selection across multiple benchmarks.

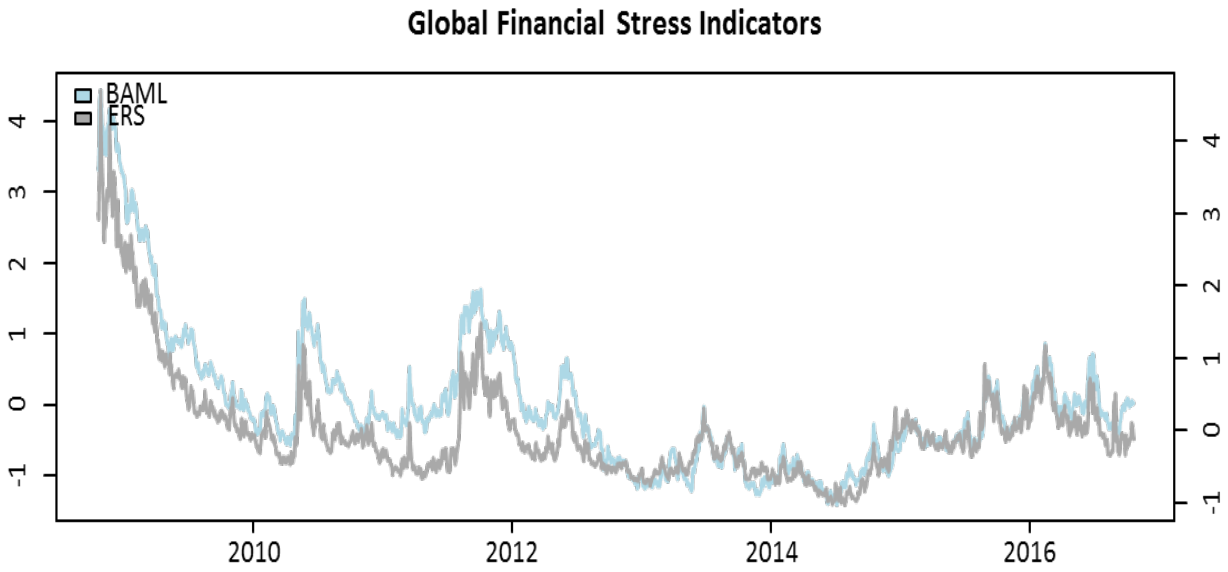
Risk Committee

The Risk Committee is comprised of the following voting members: Tom Tull, CIO; Carlos Chujoy, Portfolio Manager; Sharmila Kassam, Deputy CIO; John Streun, Director of Public Equities; Leighton Shantz, Director of Fixed Income; and Anthony Curtiss, Interim Director of Hedge Funds. Further, non-voting members from senior investment staff attend the Risk Committee as needed. The Committee looks both within and across the asset classes to develop a comprehensive view of total Trust risk and to make informed recommendations.

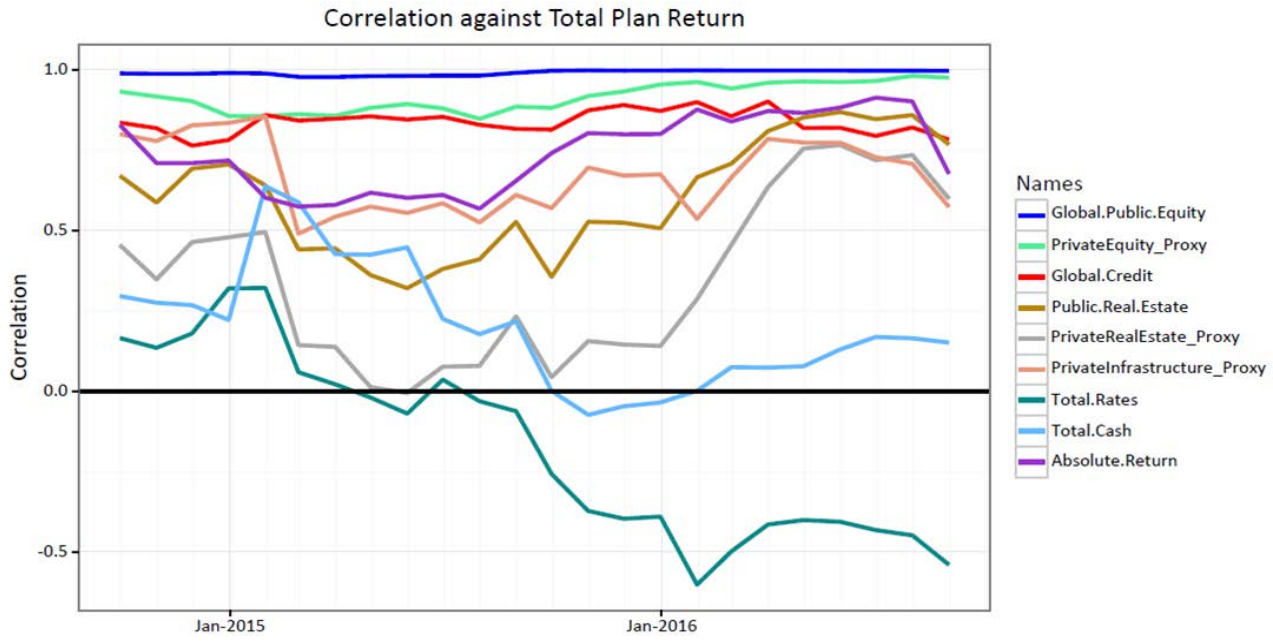
The Risk Committee's purposes are to identify and measure salient investment risks relevant to the Trust, monitor risks relative to expectations, define risk boundaries and tolerances within asset allocation and use reasonable efforts to manage the risk profile of Trust.

Over the preceding fiscal year, the committee's discussions were shaped by market dynamics, by members' collective efforts to address areas of interest, and by individual members' analysis of actual or potential portfolio risk. In this regard, discussions and reviews were conducted from the perspective of addressing not only market related risk but also plan asset risk. For example, from a market risk standpoint, the Risk Committee reviewed and discussed a variety of topics such as China, oil prices, probabilities of default in the energy sector, interest rates, inflation and the effect of foreign currency. The announcement of the exit of the United Kingdom from the European Union called for an emergency session by the Chief Investment Officer with members of the Risk Committee to discuss the implications of such an event and if the announcement warranted any actions to be taken.

The risk committee sessions usually begin with a review of global financial stress levels, stress levels at the asset class level and discussion of more topical issues in that order. While the current reading for the ERS multi asset class financial stress index is lower than it was in 2008, stress levels moved up starting in 2014, as seen in the chart below. The increase has been due in part to market concerns about Greece defaulting on its debt, investor concern about a slowdown in the Chinese economy as well as the Chinese real estate market and burgeoning debt levels, the increased volatility in the price of oil and gold and the appreciation of safer currencies such as the USD, Japanese Yen, and Swiss Franc. More recently, the stress indicator reflects concerns regarding interest rate policy and Brexit.



The trailing 12-month period ending September 2016 was a very difficult time for active management, as was evidenced in the high levels of correlations across asset classes. Most of the asset classes that the ERS plan has exposure to saw a jump in the level of correlations. The jump could be attributed to some of the factors discussed earlier. High correlations reduce the benefits of diversification and therefore drive increases in risk.



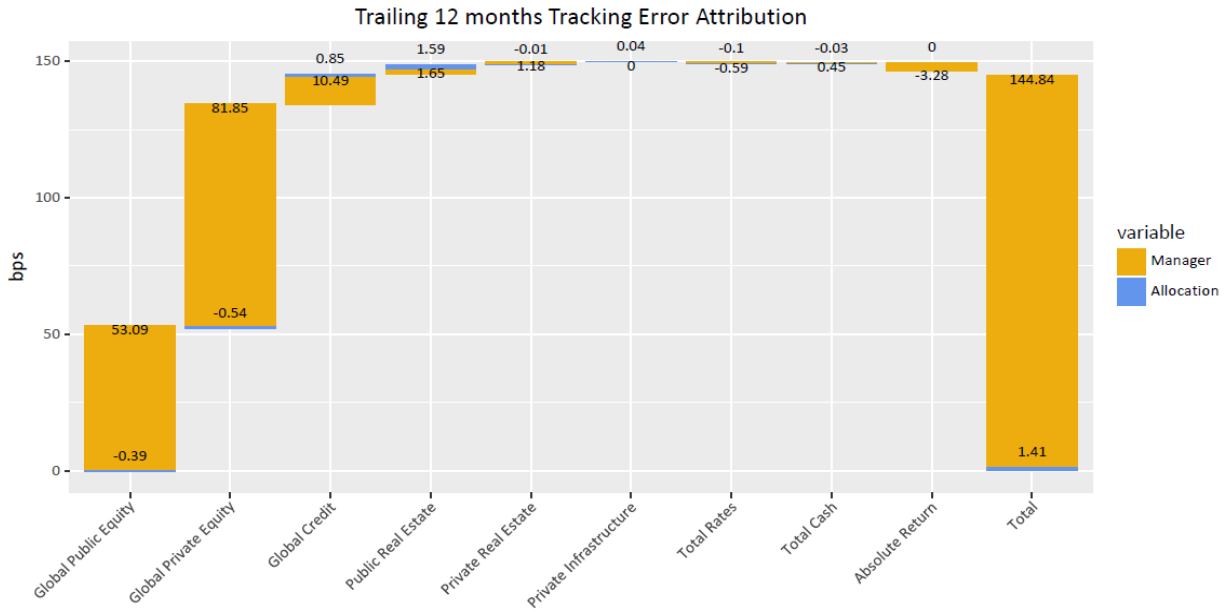
The review and analysis of risk at the Plan and portfolio level can be driven by what the RMAR team deems to be of interest to the constituency of the Risk Committee, by the need to increase awareness of

a particular issue, or by a topic brought up by a member of the Risk Committee. An example of an agenda item for the committee's consideration was the topic of market sensitivity discussed at the November 2015 Risk Committee meeting. One of the analytics the team monitors had signaled a change in the trend of the sensitivity of the Plan Asset Returns relative to the Official Plan Benchmark. The RMAR team brought this to the attention of the Risk Committee and elaborated as to the possible causes.

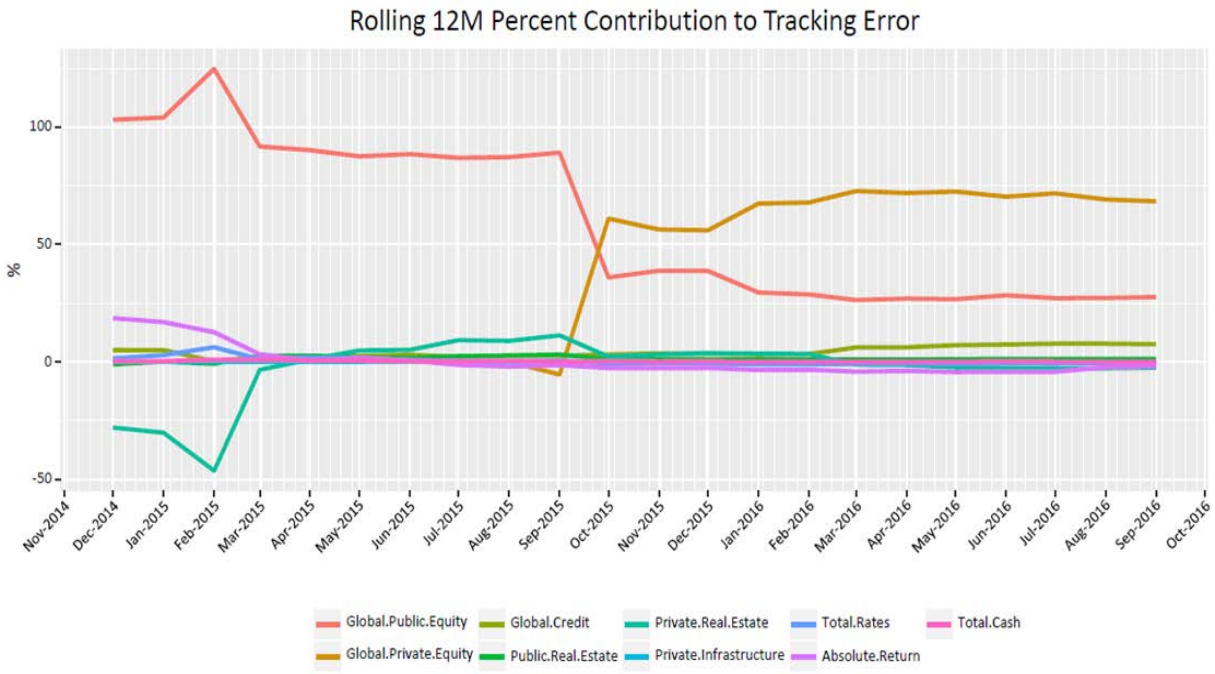
Following the discussion, the committee suggested and recommended that the RMAR team track not just the overall plan's market return sensitivity but also the sensitivity of the Plan's largest constituents, liquid and non-liquid assets. This is an example of how the debate and discussion process can lead to the continued refinement and expansion of fund reporting.

In September 2016, the portfolio construction discussion revolved around the drivers of diversification/concentration risk for the Absolute Return portfolio. In this instance, the RMAR team provided a review of the mathematical relationships between total portfolio risk, relative portfolio risk, beta and correlations. Correlation is a measure that is used to depict how diversified or concentrated a portfolio is relative to either a benchmark or a set of portfolios. An illustration of the theoretical upper and lower bound correlation limits was discussed for additional perspective.

During the October 2016 Risk Committee meeting, the discussion focused on the drivers of tracking error for the plan and a review of market signals. The following exhibit shows that the percent contribution to Tracking Error (TE) is driven primarily by the Global Public Equity and Private Equity asset classes.



Further examination on the contributors to TE revealed a shift in its composition. The drop in the contribution to TE from Global Public Equities corresponded with an increase in Private Equity's contribution, as seen in the chart below. This shift was caused when Private Equity had its benchmark changed from the actual returns of the portfolio to the MSCI ACWI IMI Gross + 300 bps in September 2015.



Outlook

For the upcoming fiscal year, the role of the RMAR team will be to continue to expand and refine the analytics for the plan as it has done in previous years. The team plans to enhance the risk management capabilities as follows:

a. Develop a framework to monitor underlying trends that could shed light of potential systemic and financial contagion risks
b. Measure the plan's exposures to market and fundamental factors and to exposures using position level data
c. Leverage the current research platform on derivatives to generate relative value trade ideas
d. Construct systematic investment strategies for risk and exposure management
e. Explore and research the viability of a currency overlay program

STAFF RECOMMENDATION:

This agenda item is provided for informational and discussion purposes only. No action is required.

PUBLIC AGENDA ITEM - #7

Review, Discussion and Consideration of ERS' Emerging Manager Program

December 1, 2016

BACKGROUND:

The Employees Retirement System of Texas (ERS) continues to embrace and expand upon its efforts to hire emerging managers, which the Legislature defines as private professional investment managers with assets under management of $2 billion or less.

ERS had total plan assets of $25.5 billion as of September 30, 2016, with approximately 2/3 of plan assets internally managed and 1/3 of plan assets externally advised/managed. Of the $8.6 billion that is externally advised/managed, approximately $984 million (approximately 11%) has been invested with or committed to emerging managers.

Staff has determined that, over the long term, inclusion of emerging managers as part of external investment management should enhance and diversify ERS' expected total portfolio investment characteristics and complement ERS' internal investment management. The purpose of selecting and managing of emerging managers is to maintain prudent diversification of assets, to maximize management responsibility, and to preserve the System's investment capital consistent with the fiduciary responsibility of investing the trust.

Calendar Year 2015 Highlights:

The ERS *Emerging Manager Program* ("Program") focuses on identifying and developing emerging managers through the following approaches:

- ERS Emerging Manager Team
- ERS External Advisor Website
- Managers of Emerging Managers
- Outreach: Industry Conferences and Strategic Partnerships
- Current Allocation – Maintain the 10% Target of External Management

ERS Emerging Manager Team – ERS began its initial efforts with emerging managers in Global Public Equity, Private Equity and Private Real Estate in 2010. As the program matured, each asset class has taken ownership of their respective emerging manager program. The decision to incorporate emerging managers into asset classes has strategic benefits. First, it is important for managers and industry associations to have direct contact with each asset class. Second, the program is integrated into the investment program and established as part of the overall investment objectives. Third, the program is positioned to really complement internal management of each of these asset classes.

The team is comprised of the following individuals from each asset class with oversight by their respective asset class director. The overall program is overseen by the Deputy Chief Investment Officer and Chief Investment Officer.

Public Equities:	Lauren Honza/Mike McCrary
Private Equity:	Davis Peacock/Adriana Ballard
Private Real Estate:	Amy Cureton
Hedge Funds:	Panayiotis Lambropoulos
Fixed Income:	Ben Bowman

ERS External Advisor Website - ERS developed the ERS *External Advisor Website* to encourage managers to begin a direct dialogue with ERS. This dedicated website details helpful information and has continued to be a portal for interested firms to register with ERS.

Managers of Emerging Managers - ERS utilizes managers of emerging managers as they have demonstrated to have the resources, experience, relationships, and industry knowledge to identify and evaluate emerging managers. These partners are staffed to complete due diligence on newer managers and have investment committees and infrastructure uniquely set up to evaluate and hire emerging managers. ERS primarily looks to the manager of emerging managers to source, diligence and monitor the underlying managers. These partners are tasked with promoting an equal opportunity access policy with respect to meeting with emerging managers that includes providing timely, frank feedback to emerging managers on behalf of ERS. We additionally encourage our partners to continue to mentor and develop emerging managers that have not been hired by ERS consideration by ERS or other investors. ERS currently uses the following manager of emerging managers: GCM Grosvenor, Oak Street Real Estate Capital and Legato Capital Management.

Outreach: Industry Conferences and Strategic Partnerships – On January 13, 2016, ERS and the Teacher Retirement System of Texas (TRS), together with sponsors Grosvenor and Rock Creek, held the *2016 Texas Emerging Manager Conference* in Austin. This event had over 1,000 investment professionals from all over the United States and internationally, representing various asset classes. In addition to ERS and TRS, colleagues from other pension plans participated as speakers and panelists to discuss their emerging manager programs. Additionally, this year ERS initiated a unique networking session that included not only staff from ERS and TRS, but also other investors to guarantee that emerging managers could reach multiple investors at this one conference. Survey responses indicated that this effort was appreciated by emerging managers and differentiated from other industry events.

In addition, the *Third Real Estate Emerging Managers Summit ("REEM Summit")* hosted by ERS, TRS and Oak Street Real Estate Capital was held on January 14-15, 2016 in Austin. The conference was very successful and sold-out with 178 participants. The REEM Summit provides numerous interactive forums for investors and emerging managers to network and share ideas both on investment strategies and developing a business and team. The conference has continued to be widely regarded as an informative and innovative conference.

ERS staff has attended the major industry emerging manager conferences to share insight into ERS' Emerging Manager Program and to also keep up to date on industry developments. ERS continues to seek out industry strategic partners who can provide insight and access to smaller, newer, and more diverse managers. ERS is committed to providing opportunities for emerging managers and welcomes innovative ideas helpful to the development of emerging managers. These industry strategic partners include: The Robert Toigo Foundation (Toigo), Sponsors for Educational Opportunity (SEO), New America Alliance (NAA), Association of Asian American Investment Managers (AAAIM), National Association of Investment Companies (NAIC), National Association of Securities Professionals (NASP) and RG and Associates.

Staff, together with ERS managers of emerging managers, consultants and industry strategic partners, regularly attend and sponsor industry conferences to attract, meet and mentor emerging managers and ERS staff is committed to promoting quality emerging managers by working with them to become institutional quality, so that they may have access to a broader institutional investor base.

Current Allocation - As of September 30, 2016, ERS had $984 million (currently 11% of the Trust) invested or committed with emerging managers, which maintains the 10% of external management target of the Trust, as outlined in the *Emerging Manager Program Policies and Procedures* and *Tactical Plan*. The following chart contains a detailed overview of the commitments to emerging managers as of September 30, 2016.

Firm	Allocation as of September 30, 2016 (1)	
	Committed Amount	Market Value
Public Equity		**$94,840,495**
Legato Capital Management		**94,840,495**
Legato - Twin		11,283,198
Legato - Mar Vista		20,949,307
Legato - Ithaka		16,201,792
Legato - Affinity		19,940,277
Legato - Dean Capital Mgmt		6,964,368
Legato - Nichols		6,215,334
Legato - High Pointe		13,286,219
Private Equity	**$240,000,000**	**$189,933,142**
GCM Grosvenor - Fund I	50,000,000	36,651,458
GCM Grosvenor - Fund II	50,000,000	13,741,782
Cotton Creek Capital Partners II, L.P.	30,000,000	24,965,032
Frontier Fund III, L.P.	50,000,000	83,452,723
Frontier Fund IV, L.P.	60,000,000	31,122,147
Private Real Estate	**$226,000,000**	**$108,027,691**
Oak Street Real Estate Capital	50,000,000	46,848,849
Oak Street Real Estate Capital II	50,000,000	0
Oak Street Real Estate Capital - Sidecar (Abacus Multifamily)	20,000,000	17,321,624
Oak Street Real Estate Capital - Sidecar (Exeter Industrial)	20,000,000	2,678,843
Pennybacker Capital Fund III	15,000,000	12,853,563
Abacus Capital Group Fund III	50,000,000	21,090,083
Abacus Capital Group - Co-Invest	6,000,000	2,732,604
Singerman Real Estate Opportunity Fund II	15,000,000	4,502,125
Hedge Funds		**$540,439,460**
Southpaw Asset Management		98,481,688
Stone Lion Capital Partners LLSD LP		17,807,272
Stone Lion Capital Partners LLSD II LP		18,831,823
Castle Creek Arbitrage LLC		105,303,227
Northwest Investment Management (HK), Ltd		80,017,135
Gerchen Keller Capital, LLC		43,220,647
Conatus		60,636,574
Glazer Capital LLC		116,141,094
Complus Asia Macro Fund		0
Fixed Income		**$51,392,434**
Glendon Opportunities Fund		30,238,846
Stone Lion Capital Partners LLSD II LP		21,153,588
Total Private Market Commitments and Total Invested	**$466,000,000**	**$984,633,222**

(1) Real Estate and Private Equity values are as of 6/30/16 and approximate values at 9/30/16

The *Emerging Manager Program* continues to be an important initiative for ERS as staff believes that small and diverse managers have a strong alignment of interest with their investors. The overall goal of the program is to gain diversification and investment opportunities across all asset classes consistent with fiduciary responsibility. To meet this goal, ERS has set the following initiatives:

- Continue to refine a well-defined process for managers to follow for equal access to ERS and its managers of emerging managers;
- Continue to develop and enhance the ERS *External Advisor Website*;
- Continue to incorporate emerging managers in all investment searches consistent with ERS' fiduciary responsibility;
- Increase ERS' visibility and participation at industry conferences to expand ERS' network of emerging managers;
- Develop emerging manager relationships by continued outreach with industry strategic partners and initiate feedback on ideas and innovation for ERS' *Emerging Manager Program*;
- Focus on more direct relationships with emerging managers in ERS portfolios when aligned with the goals of the ERS' investment program and asset allocation; and
- Promote emerging manager program best practices throughout the industry by sharing information with other public and private investors.

This agenda item is provided for informational and discussion purposes only.

PUBLIC AGENDA ITEM - #8

8. Chief Investment Officer's Report

December 1, 2016

STATE OF THE TRUST REPORT:

Objective:

Investment staff continues to work with the Executive Director, Board of Trustees (Board), Investment Advisory Committee (IAC) and other divisions within the Agency to build a premier and competitive investment organization in the best interest of the Trust and its beneficiaries.

Philosophy:

- Position the Trust for the future for the sole benefit of its members and retirees
- Establish investment policies, objectives, and strategies for the purpose of earning a competitive risk-adjusted rate of return at a reasonable cost

Investment Challenges for FY2017:

- We expect higher interest rates
- Increased risk of populism and protectionism
- Strong US dollar exporting inflation and challenging our trade exports
- Brexit
- Energy prices: The US rig count has increased 33% over the past five months
- Implications of a honeymoon period after the election cycle
- Geopolitical risk

Investment Opportunities for FY2017:

- Credit
- Secondaries
- GTAA (Global Tactical Asset Allocation)
- Infrastructure

Major Initiatives for FY2017:

- Asset liability study to target future asset allocation mix
- Support legislative initiatives such as ERS Sunset Review and alternatives for addressing unfunded pension liabilities
- Continue to advance the derivatives program
- Evaluate the current and future state of investment's systems architecture to improve business processes, work flow and decision making.
- Refresh the select pool of external advisors/managers and initiate searches to refine mix of internal and external management
- Assess current and future savings through diligent negotiation of best economic deal terms
- Leverage internal investment resources to assist investment product monitoring in the Texa$aver Program and to work towards management of customized Texa$aver fund offerings
- Leverage external relationships for strategic resources and opportunities within each asset class to find better risk-adjusted returns
- Continue to expand the internship program, including diversity initiatives, and work with universities and other student development organizations focused on the investment industry
- Develop further the Investment Division career path development, communication, succession planning and team development

- Educate external parties about ERS' investment program, including emerging manager programs, and the Agency through communication efforts, that include conferences, speaking engagements and strategic relationships

People (Staffing Changes since Last CIO Review):

Staffing changes over the last twelve months reflect a positive working environment between asset classes with better communication and coordination. Emphasis is placed on promotion and internal career development.

Since the last CIO review employee changes that have taken place include:

Promotions: 10

Admin:	1
Global Equities:	3
Operations:	4
Risk Management:	1
Real Estate:	1

Other: 9

New Employees:	4
Retirements:	2
Separations:	3

Process:

- The transition to the new asset allocation guidelines is essentially complete except for Credit and Infrastructure. Credit is on track to reach an allocation of 10% of the Trust in 2017. Infrastructure will require more time for completion due to the infancy of the asset class. ERS staff continues to seek capital pooling arrangements with similarly minded investors with the objective of gaining scale and economics.

- Both Private Real Estate and Private Equity are in line with their asset allocation guidelines. A secondary transaction in Private Equity at a premium to NAV helped to bring that asset class back in line with its policy target allocation this fiscal year. Private Real Estate has also liquidated some of its holdings where valuations were excessive to monetize investment gains. Some Hedge Fund investments have also been defunded during the fiscal year as part of rebalancing of the portfolios. Investment management of each asset class within tactical bands will continue to require portfolio adjustments when advantageous to the Trust.

- During the fiscal year there have been several tactical asset allocation opportunities.

    1) Reduced the Trust's UK exposure with the sale of futures post Brexit.

    2) Utilized options in both Fixed Income and Equities to enhance trade execution.
    Net Profit: $3.5 million

    3) Increased use of ETF (Exchange Traded Funds) as placeholders until capital could be deployed effectively.

- Increase economies of scale, reduce investment management costs and pursue new sources of alpha generation. Realized savings from negotiations of fee and terms for fiscal year 2016 are approximately $28 million.

Sunset Update - Public Hearing and Commission Decision Updates:

Since the August 2016 Board of Trustees meeting, the Texas Sunset Advisory Commission has held two public meetings to discuss the review of ERS operations. The first hearing, on August 22, 2016, allowed Sunset staff to publically layout the findings and recommendations contained in the staff report – presented to the Board by ERS staff during the May 2016 quarterly meeting. The hearing also provided the opportunity for ERS to publically respond to the report and for members of the public to testify on the operations and activities of the agency. Senior agency leadership staff and several board members attended this first hearing, at which Chairman Hester, Executive Director Wilson, and Chief Investment Officer Tom Tull were able to directly respond to questions from the commissioners, primarily regarding investment governance processes.

The second public hearing occurred on November 10, 2016, and did not involve prepared agency or public testimony, but was organized strictly to allow the commissioners to consider and adopt their final recommendations related to ERS. Again, the commissioners focused their discussions on investment governance issues; however, other topics were also briefly discussed, such as health network coverage, public information activities, and board composition. The commission adopted all 15 recommendations included in the five issues of the original staff report, unanimously without significant discussion. The commissioners also considered seven new recommendations not made by Sunset staff in the original report. Of the seven new recommendations considered, the following three were adopted:

1. **Statutory Change proposed by Senator Charles Schwertner:** "Change the statutory requirement for the ERS Board of Trustees to adopt its experience study, and resulting actuarial assumptions, from once every five years to once every four years." (The change would take effect with the adoption of the next experience study in 2018, requiring the following study to be adopted in 2022 instead of 2023.)

2. **Statutory Change proposed by Senator Charles Schwertner:** "Require the ERS Board of Trustees to approve any individual investment over $100 million." (Senator Schwertner clarified during the hearing that his intent was for this change to apply to alternative investments only – private equity, private real estate, hedge funds, and infrastructure investments.)

3. **Management Action proposed by Senator Charles Schwertner:** "Direct ERS, as part of its 2017 internal audit review of investment governance, to consider best practices in investment decision-making process, including
    - the composition of its internal investment committees,
    - investment authority,
    - veto authority, and
    - board oversight and use of the Investment Advisory Committee.

    ERS would provide a copy of the internal audit report to the appropriate substantive legislative oversight committees, as well as the governor, lieutenant governor, and speaker upon presentation to the Board of Trustees." (The internal audit review of investment governance operations in place at ERS, along with industry best practices, is currently scheduled to be presented to the Board of Trustees during the February 2017 quarterly meeting, and would then be released to the listed legislative oversight offices.)

STAFF RECOMMENDATION:

This agenda item is provided for informational and discussion purposes only. No action is required.

PUBLIC AGENDA ITEM - #9

9. Adjournment of the Joint Meeting of the Board of Trustees and Investment Advisory Committee and Recess of the Board of Trustees

December 1, 2016

The Board of Trustees will reconvene as a Committee of the whole on Friday, December 2, 2016 at 8:00 a.m. to consider Audit and Board agenda items.

PUBLIC AGENDA ITEM - # 10

10. Review and Approval of the Minutes to the August 16, 2016 ERS Audit Committee Meeting

December 2, 2016

BACKGROUND:

The minutes to the Employees Retirement System of Texas Audit Committee meeting held on August 16, 2016 are included with this agenda item as Exhibit A. The minutes are submitted to the Board for review and approval.

PROPOSED MOTION:

Staff recommends the following motion to the Board of Trustees:

> I move that the Board of Trustees of the Employees Retirement System of Texas approve The minutes to the ERS Audit Committee meeting held on August 16, 2016.

ATTACHMENT – 1
Exhibit A – Proposed Minutes to the ERS Audit Committee Meeting of August 16, 2016

Audit Committee Meeting

August 16, 2016

ERS
Employees Retirement System of Texas

Presented for Review and Approval

December 2, 2016

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III. Executive Session – In accordance with Section 551.076, Texas Government Code, the Audit Committee of the Board of Trustees, a committee of the whole of the Board, will meet in executive session to deliberate: (1) the deployment, or specific occasions for implementation, of security personnel or devices; and (2) a security audit. Thereafter, the Board may consider appropriate action in open session……3

IV. Adjournment of the ERS Board of Trustees Audit Committee and Recess of the Board of Trustees……4

AUDIT COMMITTEE MEETING
EMPLOYEES RETIREMENT SYSTEM OF TEXAS

August 16, 2016
ERS Board Room
ERS Building – 200 E. 18th Street
Austin, Texas 78701

TRUSTEES PRESENT
I. Craig Hester, Chair
Doug Danzeiser, Vice-Chair
Ilesa Daniels, Member
Cydney Donnell, Member
Brian Ragland, Member
Jeanie Wyatt, Member

IAC PRESENT
Vernon Torgerson, Member

ERS STAFF PRESENT
Porter Wilson, Executive Director
Catherine Terrell, Deputy Executive Director
Paula A. Jones, Deputy Executive Director and General Counsel
Shack Nail, Special Projects and Policy Advisor
Tony Chavez, Internal Auditor
Jordan Hajovsky, Co-Director Operations Support
Robin Hardaway, Director of Customer Benefits
Wendy McAdams, Co-Director of Operations Support
Tom Tull, Chief Investments Officer
Chuck Turner, Chief Information Officer
Kelley Davenport, Executive Office
Liz Geise, Benefits Communications
Beth Gilbert, Internal Audit
Jennifer Jones, Governmental Affairs
Sharmila Kassam, Deputy Chief Investment Officer
Robert Lee, Investments
Ricardo Lyra, Investments
Nick Maffeo, Investments
Betty Martin, Investments
Pamela Maas, Benefit Contracts
Roger Nooner, Benefits Communications
Becky O'Brien, Finance
Davis Peacock, Investments
Jonathan Puckett, Internal Audit
Karen Norman, Internal Audit
Pablo de la Sierra Perez, Investments
Bernely Tharp, Benefit Contracts
Tommy Williams, Information Systems

ALSO PRESENT
Keith Barnes, Blue Cross Blue Shield of Texas
Andrew Clark, Speaker's Office
Michael Clayton, State Auditor's Office
Kristen Doyle, Aon Hewitt
Brittany George, Weaver & Tidwell

Yves-Laurent Khoury, Blue Cross Blue Shield of Texas
Gabriel Puente, SPI
Ben Reyfitz, State Auditor's Office
Steve Von, Aon Hewitt
Karen K. Wilson, Northrop Grumman

Meeting of the ERS Board of Trustees' Audit Committee

Mr. Craig Hester, Chairman of the Board of Trustees of the Employees Retirement System of Texas (ERS), noting a quorum was present, called the meeting to order and read the following statement:

"A public notice of the Board of Trustees meeting containing all items on the proposed agenda was filed with the Office of the Secretary of State at 10:56 a.m. on Thursday, August 4, 2016 as required by Chapter 551, Texas Government Code, referred to as "The Open Meetings Law."

The Board of Trustees convened as a committee of the whole at 8:00 a.m. to consider Audit Committee agenda items.

I. REVIEW AND APPROVAL OF THE MINUTES TO THE MAY 17, 2016 ERS AUDIT COMMITTEE MEETING

Ms. Cydney Donnell, Audit Committee Chair opened the floor for a motion on the approval of the minutes from the Audit Committee Meeting held May 17, 2016. Mr. Hester recommended two revisions.

MOTION made by Mr. Brian Ragland, seconded by Mr. Doug Danzeiser, and carried unanimously by the present members of the Audit Committee to approve the corrected minutes to the meeting held on May 17, 2016.

II. PRESENTATION, DISCUSSION AND CONSIDERATION OF AUDIT COMMITTEE AGENDA ITEMS:

a. External Audit Reports - Audit Committee Chair Cydney Donnell, introduced ERS Director of Internal Audit Tony Chavez. Mr. Chavez introduced Michael Clayton and Ben Reyfitz with the State Auditor's Office (SAO) to report on their findings from the external audit of the ERS Incentive Compensation Plan for Plan Year 2015, presented in Exhibit A.

Mr. Clayton and Mr. Reyfitz presented some background information on the Incentive Compensation Audit. The audit's objective was to determine whether ERS correctly calculated and paid incentive compensation for Plan Year 2015 in accordance with state policies and procedures. One employee received an overpayment resulting from a miscalculation based on an incorrect date. ERS Internal Audit's work papers were used in conjunction with the SAO audit The SAO concluded that ERS generally awarded and paid incentive compensation in accordance with its policies and procedures for Plan Year 2015. ERS was rated as a low risk by SAO. After some questions from the board, Ms. Donnell thanked the SAO auditors for their work.

b. Internal Audit Reports - Mr. Chavez introduced Jonathan Puckett, Internal Auditor. Mr. Puckett reported the objective of the Disability Retirement Program audit was to determine if ERS processes disability benefits in accordance with regulatory requirements. The overall assessment of the program

was satisfactory. Observations noted were 1) monitoring activities provide limited assurance for continued participation in the program and 2) follow-up was not performed on information in application packets that may impact eligibility.

Craig Hester, Board Chair, asked about procedures for monitoring the 5% of recipients who live out of state. Mr. Chavez explained current monitoring best practices and the level of risk factors considered. Ms. Donnell noted that the controls are good and this audit would help improve these processes.

Mr. Chavez reported on Quarterly Investment Agreed-Upon Procedures. Nothing unexpected was noted. The procedures and test results are noted in Exhibit B.

Mr. Chavez introduced Beth Gilbert, Internal Auditor, who reported on the Status of Audit Recommendations, Exhibit C. Ms. Gilbert reported that all management action plans were implemented and highlighted the development of a database administration governance document and procedures by the Information Systems Division.

Mr. Chavez reviewed Internal Audit Risk Assessment and the Proposed FY2017 Annual Audit Plan. Mr. Chavez reviewed the development of the risk assessment, including revised risk factors and the audit universe. Internal Audit collaborated with the Board, Executive Management, Senior Management and staff for the proposed FY2017 Annual Audit Plan.

Mr. Porter Wilson, Executive Director, noted the proposed plan is robust and includes contingency audits that anticipate additional audit staff. Both Ms. Donnell and Mr. Hester commended the Internal Audit Plan. Ms. Donnell asked that the audit frequency be included in the Board information.

Ms. Donnell asked for a motion on this action item. Mr. Danzeiser moved that the Board of Trustees approve and adopt the proposed Fiscal Year 2017 ERS Internal Audit Plan as listed in Exhibit A of this agenda item.

MOTION made by Mr. Doug Danzeiser and seconded by Mr. Brian Ragland and carried unanimously by the present members of the Audit committee.

As required by statute, Mr. Chavez reaffirmed the independence of the ERS internal audit function.

III. **EXECUTIVE SESSION** – In accordance with Section 551.076, Texas Government Code, the Audit Committee of the Board of Trustees, a committee of the whole of the Board, will meet in executive session to deliberate: (1) the deployment, or specific occasions for implementation, of security personnel or devices; and (2) a security audit. Thereafter, the Board may consider appropriate action in open session.

At 8:27 a.m. on August 16th, 2016, Craig Hester, Chair of the ERS Board of Trustees, announced the Audit Committee of the Board would meet in executive session in accordance with Section 551.076, Texas Government Code, the Audit Committee of the Board of Trustees, a committee of the whole of the Board, will meet in executive session to deliberate: (1) the deployment, or specific occasions for implementation, of security personnel or devices; and (2) a security audit. Thereafter, the Board may consider appropriate action in open session. The Board recessed for the Executive session and was presented an audit of ERS data security.

After the executive session, at 9:09 a.m. on August 16th, 2016, the Audit Committee of the Board of Trustees reconvened in open session. Mr. Hester stated for the record that no action, decision or vote was taken by the Board in Executive session.

IV. **ADJOURNMENT OF THE ERS BOARD OF TRUSTEES AUDIT COMMITTEE AND RECESS OF THE BOARD OF TRUSTEES–** Following a temporary recess, the Board of Trustees will reconvene with the Investment Advisory Committee to take up the following Joint Board of Trustees and Investment Advisory Committee agenda items.

PUBLIC AGENDA ITEM - #11a

Presentation, Discussion and Consideration of Audit Committee Agenda Items:

11a. Internal Audit Reports

December 2, 2016

BACKGROUND:

As part of the Fiscal Year 2016 audit plan, Internal Audit completed four engagements:

- Incentive Compensation Plan
- Hedge Funds
- Prescription Drug Program
- Investment Compliance Agreed-upon Procedures (AUP).

These audits are included in this agenda as Exhibit A-D.

STAFF RECOMMENDATION:

These agenda items are presented for discussion purposes only. No action is required.

ATTACHMENTS – 4

Exhibit A – Incentive Compensation Plan Audit Report

Exhibit B – Hedge Funds Audit Report

Exhibit C – Prescription Drug Program

Exhibit D – Investment Compliance Agreed-upon Procedures Report

ERS

EMPLOYEES RETIREMENT SYSTEM OF TEXAS

ERS INTERNAL AUDIT DIVISION

To provide independent and objective assurance on the effectiveness of controls and operations to meet ERS' strategic directions.

Incentive Compensation Plan #2017-01

NOVEMBER 14, 2016

FROM THE DIRECTOR

Internal Audit has completed its audit of the Incentive Compensation Plan ("Plan") at the Employees Retirement System of Texas.

Based on the audit scope areas reviewed, the system of internal controls provides reasonable assurance that key goals and objectives will be achieved despite control gap corrections and improvement opportunities identified. Control gap corrections and improvement opportunities identified have the potential to negatively impact the achievement of ERS' strategic objectives.

1. Continue to ensure sufficient and relevant information provided to executive management in a timely manner. (Significant)

Detailed results and observations are included in subsequent pages. Other matters deemed less significant were communicated with management directly. We thank management and staff of the Human Resource, Investments and Finance divisions for their courtesy and cooperation extended to us during the review.

Sincerely

Anthony Chavez, CIA, CGAP, CRMA
Director, Internal Audit Division

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OBJECTIVE

The overall objective of the audit was to determine if recommended incentive compensation awards were in accordance with ERS' Incentive Compensation Plan ("ICP" or "Plan"). The sub-objectives of the audit were:

ICP Participation and Development:

a) Are controls present to ensure participants are eligible and meet minimum requirements to receive the award?

b) Are controls present to ensure performance goals are developed in accordance with ICP guidelines?

ICP Award Calculations:

a) Are controls present to ensure the accuracy of recommended awards?

b) Are controls present to ensure recommended awards align with ICP directives?

The ICP is intended to provide meaningful incentives to participants who excel in carrying out strategic performance priorities.

SOURCE: 2016 ICP

CONCLUSION AND SUMMARY RESULTS

OVERALL ASSESSMENT	SATISFACTORY	
SCOPE AREA	**RESULT**	**RATING**
ICP Award Calculations	Based on audit scope areas reviewed internal controls are effective to ensure accuracy of award calculations.	**Satisfactory**
ICP Participation & Development	Observation 1: Continue to ensure sufficient and relevant information provided to executive management in a timely manner. (Significant)	**Needs Improvement**

BACKGROUND

The Employees Retirement System of Texas ("ERS") Incentive Compensation Plan ("ICP" or "Plan") was originally adopted in December 2006. The Plan provides incentives to those participating employees who excel in carrying out the strategic performance priorities established by the Board. Before the beginning of each Plan year, the Board or Executive Director selects those eligible employees to be designated as Plan participants. Employees are notified of eligibility and of the specific criteria for determining ICP Award amounts. To receive an ICP award, the participant must have complied with ERS Investment Policy, ERS' Standards of Conduct, ERS' fiduciary authority, applicable laws and have exceeded his/her overall job performance standards during the Plan year. The Plan is separate and in addition to annual performance evaluations for merit actions.

ICP awards are earned based on quantitative and qualitative (discretionary) performance goals. All participants are assigned a performance goal based on overall Trust Fund performance. Additional quantitative performance goals are assigned based on asset class or individual investment portfolio.

Payment for ICP awards are made in three installments of 50% - Year 1, 25% - Year 2 and 25% - Year 3. Payments in fiscal year 2017 will include awards from Plan Years 2016, 2015 and 2014. Projected payout for fiscal year 2017 is $2.89 million based on current Plan Year 2016 recommended awards.

ICP Plan Objectives

- *Provide participating employees with the opportunity to earn reasonable incentive compensation for leadership and outstanding performance based on the Trust Fund performance as well as performance of respective asset classes, portfolio and individual contributions;*
- *Encourage sustained levels of outstanding investment performance prudently achieved without undue risk;*
- *Promote teamwork among employees;*
- *Support ERS' strategic and operational goals;*
- *Attract and retain key employees in a cost-effective manner; and*
- *Focus employees on high quality outcomes.*

(SOURCE: 2016 ICP)

PLAN YEAR 2016 KEY CHANGES

Several key changes were adopted by the Board and implemented for the 2016 Plan to better align with Board objectives and address prior external and internal audit observations. Key changes implemented include, but are not limited, to:

Participation & Development

- Human Resources Division is now the primary division responsible for Plan implementation
- All participants are assigned a discretionary performance goal set at a weight of 25%. Previously only select participants were assigned a discretionary goal with weights ranging from 10% - 90%.
- All participants assigned a minimum Total Trust Fund weight of 25%. Previously, all participants were assigned this goal with weights ranging from 10%-25% depending on position.

Award Calculation

- To improve the segregation of duties, the Finance Division now calculates Plan award calculations including direct receipt of supporting performance results from investment consultants.
- The Investments Division developed a qualitative scoring tool to assist in assessing discretionary goals. The tool lists discretionary components for evaluation and includes examples to assist evaluators. In addition, overall results are compiled and presented to senior investment team members for review, consideration and ranking.

PLAN YEAR 2016 ICP AWARD HIGHLIGHTS

Recommended ICP awards decreased 50% in Plan Year 2016 from Plan Year 2015. Two contributing factors for this decrease were:

1. **Total Trust** Performance did not surpass the relative bench-mark for all performance periods (1, 3, and 5 year) resulting in no awards for this performance goal. Total Trust ICP awards were $1.52 million in Plan Year 2015.
2. **Discretionary** recommended awards decreased by approximately $400,000 from $1.69 million in Plan Year 2015 to $1.28 in Plan Year 2016. Decrease due to cap weight of 25% and decrease in goal realization from 94% to 84%. (Realization is the percent of recommended award over maximum award possible.)

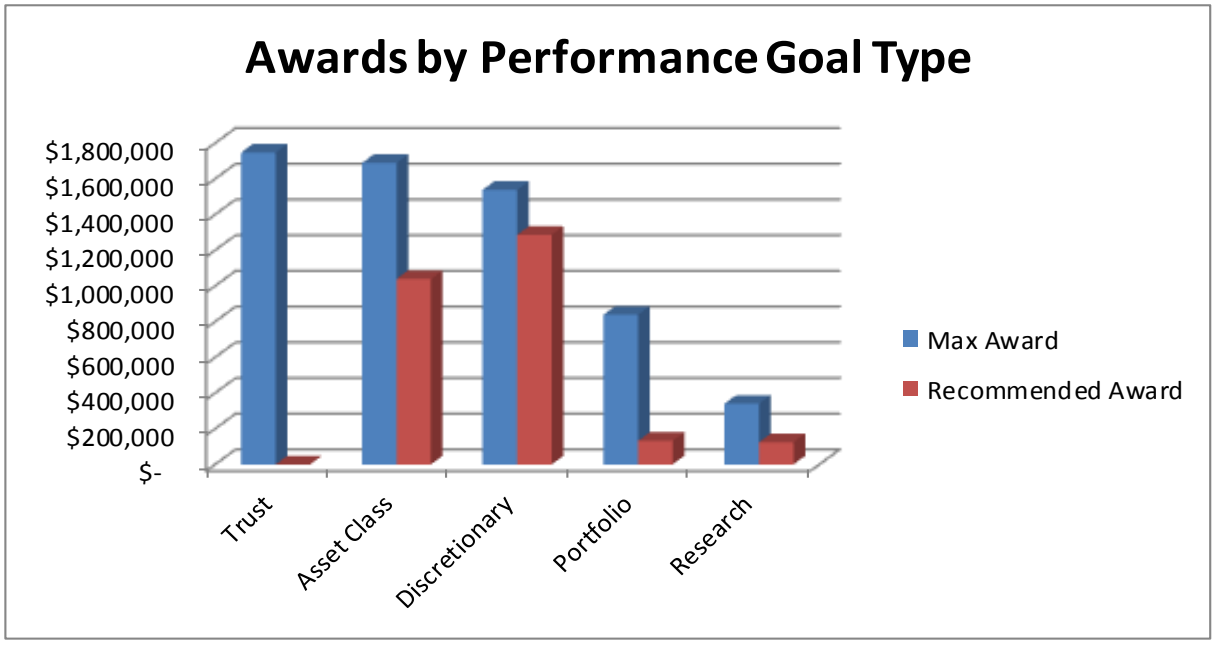
2016 ICP Results:

$2.58 million—Plan Year 2016 ICP Awards submitted for approval

$6.15 million—Maximum Plan Year 2016 awards possible

69– Participants recommended to receive ICP

71 —Participants eligible to receive ICP



Performance Goal Types

- *Total Trust—aggregate performance of all portfolios of the Trust Fund*
- *Asset Class—Category of investments that exhibit similar characteristics (Global equities, private equity, fixed income, real estate, hedge fund)*
- *Portfolio/Research — a grouping of investments associated with a portfolio, strategy, geography or other distinguishing characteristic research coverage of certain companies assigned to a Participant*
- *Discretionary - Qualitative performance based on participants merit/performance as determined by supervisor.*

SCOPE AND METHODOLOGY

We performed this audit in accordance with the fiscal year (FY) 2017 annual audit plan. Internal control activities reviewed include those in place during FY 2016 and at the time of audit fieldwork testing which ended on October 31, 2016.

The audited period covered Plan Year 2016 Incentive Compensation Awards submitted to ERS' executive office for approval.

We conducted this audit in accordance with Generally Accepted Government Auditing Standards and in conformance with the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives.

A defined set of control objectives was utilized to focus on operational goals for the identified scope. The Committee of Sponsoring Organizations of the Treadway Commission Internal Control Integrated Framework Control was the basis for internal control assessment. Our Internal Audit opinion is an assessment of the condition of the overall control environment based on the effectiveness of internal control activities through the audit period and the degree to which defined control objectives are being met. Our Internal Audit opinion is not a guarantee of operational effectiveness or regulatory compliance, particularly in areas not included in the scope of this audit.

This audit included a review of internal controls considered relevant to audit objectives including review of statutes, policies and procedures, interviews with management and staff, data analysis and testing procedures.

Audit procedures performed should not be considered part of the control process and management is responsible for accuracy of awards.

RELATED AUDITS

SAO Report 16-030 Incentive Compensation at Selected Agencies (June 2016)

Internal Audit Report 2016-01 Incentive Compensation Audit (November 2015)

SAO Report 15-032 Incentive Compensation at Selected Agencies (May 2015)

Internal Audit Report 2015-06 Public Equity Portfolio Trading (April 2015)

Internal Audit Report 2015-01 Incentive Compensation Audit (November 2014)

OBSERVATIONS AND RECOMMENDATIONS

1. Continue to ensure sufficient and relevant information provided to executive management in a timely manner. (Significant)

The Executive Director has been given the authority to administer the Plan as he views appropriate. This authority includes approval of participant goals for the Plan Year. Participant goals range from traditional, straight-forward calculations based on Board approved benchmarks to ad-hoc, complex calculations based on modified benchmarks. For certain ad-hoc performance goals consultants have assisted in developing a goal that is aligned with intended objectives and to confirm that the methodology is prudent. Although a participant goal memo is provided to the Executive Director for approval, all information is not supported and significant factors are not always highlighted to assist in review for alignment with intended ICP objectives.

ICP Participant Goals Memo

Memo submitted to Executive Director for approval that establishes and documents performance goal methodology and assumptions for atypical[1] goals particularly in alternative and fixed income asset classes.

1 - Non Total Trust Fund and Discretionary performance goals.

In administering the Plan, the Board or Executive Director, with input from ERS senior management, shall have discretionary authority to interpret the Plan, document, and to administer the Plan in accordance with its terms.

SOURCE: 2016 ICP

Review of the executive director participant goal memo for the 2016 Plan Year and associated documentation identified the following:

- Calculation methodology memos including investment consultant prudence letters dated after ICP methodology memo submitted to Executive Director for approval. The methodology memo submitted to the Executive Director states that prudence letters are available at the time the memo was submitted. Recommended awards for related performance goals was $677,000.
- For one performance goal it was communicated to executive management that a prudence letter was received from investment consultant to support the methodology. Review of the investment consultant letter identified that the consultant had no comment on the planned calculation methodology to be used but rather noted the reasonableness of the proposed benchmark. Recommended awards for related performance goal was $198,000.
- For Plan Year 2016 11 new quantitative participant goals were developed that resulted in approximately $300,000 in recommended awards. These new goals were in response to a reduction in qualitative goal (discretionary) goal weights. Although goals were noted in the methodology memo, these goals were not specifically identified as new to the ICP, nor did it identify the number of participants affected or the potential awards associated with goals were communicated in memo.

The executive director participant goal memo is a key document in administering the Plan and helps to validate ERS' organization governance to external stakeholders. The goal memo should communicate key changes and assumptions, associated risks and conclusions to support final decisions. An example of these practices can be found in a prudence letter developed by one of ERS' investment consultants to support a new performance goal calculation methodology. The prudence letter communicated potential flaws and risk associated with potential calculation methodology and the approach/rationale to address each risk.

ICP Calculation Methodology Risks:

- Benchmarks that are biased or not comparable to investment objectives
- Incentivizing excessive risk taking
- Incentivizing the wrong performance objective
- "Cherry-picking" investments for the purposes of including in the ICP

Source: ERS investment consultant memo

Both the clarity of the information and effectiveness with which it is communicated are important to ensuring messages are received as intended.

SOURCE: COSO

RECOMMENDATIONS

In coordination with the Human Resource Division, the Investments Division should ensure participation goal memos submitted to the Executive Director for approval:

- Identify new performance goals developed and added/deleted from ICP
- Identify those benchmarks that were developed solely for the ICP and may differentiate from Board approved benchmarks
- Provide estimated ICP awards should performance be fully realized
- Have all supporting documentation finalized before submission to Executive Director.

MANAGEMENT ACTION PLAN

Investment management agrees with the recommendation for continuing to ensure sufficient and relevant information is provided to executive management in a timely manner. Prior to the beginning of each ICP plan year, staff provides the Executive Director a memo outlining the differences from the prior plan year ("Plan Year Goals Memo"). The plan has evolved significantly over the past few years so staff's Plan Year Goals Memo to the Executive Director has evolved as well.

Investment management agrees the Plan Year Goals Memo should continue to provide specific highlights of new or different performance goals in a more detailed manner. This disclosure will continue to include a description of goal methodology that was developed solely for ICP purposes, but also include (1) background on why the goal needed to be developed rather than derived from the ERS Investment Policy; (2) explanation of how staff reached the goal methodology and how it is consistent with the intent of the investment program; (3) if consultant was used, then a prudence letter regarding the goal methodology; (4) number of staff affected; and (5) which prior goals were replaced by the new goals. All documentation supporting the Plan Year Goals Memo will be finalized before submitting to the Executive Director. Following the submission of the Plan Year Goals Memo, Investment management will meet with Executive Office and Human Resources to discuss the changes, if any, to plan goals for the upcoming plan year.

ICP specific goals are only created if no goal is explicitly stated in the ERS Investment Policy for the business function being incentivized. As an example, the FY 2016 Plan Year was the first year that the plan focused on a maximum of 25% qualitative goals. To accomplish this requirement of the plan, staff reviewed for several months with consultants, in addition to surveying peers, how quantitative goals can be used specifically in private equity, private real estate and infrastructure. Investment management asked consultants to review the final methodologies to provide a prudence letter. As a result, several new quantitative goals replaced prior qualitative goals. Consultant reviews were similar yet documentation in the form of prudence letters differed between firms.

During August 2015 when this transition was taking place for FY 2016 Plan Year, there were discussions with the Executive Office before August 31, 2015. All goal methodology memos were provided shortly after the FY 2016 Plan Year Goals Memo was submitted to the Executive Director but definitely prior to the start of the FY 2016 Plan Year. Significant time was spent by staff to determine best practices and the intent is for all of the established goals identified during this process, other than private infrastructure, to be maintained as the best goals to incentivize the intended outcomes of the investment program. Private infrastructure is a nascent asset class that requires further industry and peer review so staff will be reviewing to finalize a more relevant goal than cost savings if one is possible.

Investment staff will continue to review the industry and peer trends to note if there are changes in best practices for goals.

Responsible Position: Chief Investment Officer, Deputy CIO and Director of Investment Services

Implementation Date: August 2017 (For the 2018 Plan Year)

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EMPLOYEES RETIREMENT SYSTEM OF TEXAS

ERS INTERNAL AUDIT DIVISON

To provide independent and objective assurance on the effectiveness of controls and operations to meet ERS' strategic direction.

Hedge Funds Audit #2016-03

NOVEMBER 02, 2016

FROM THE DIRECTOR

Internal Audit has completed its Hedge Funds audit at the Employees Retirement System of Texas.

Based on the audit scope areas reviewed, internal controls are effective and substantially address significant risks related to operational execution and regulatory compliance. The organization's system of internal controls provides reasonable assurance that key goals and objectives will be achieved despite control gap corrections and improvement opportunities identified. The following observations were noted in the audit:

1. Monitoring of performance versus peer group hedge funds not performed
2. Certain information provided to key decision makers and stakeholders is not accurate

Detailed results and observations are included in subsequent pages. Other matters deemed less significant were communicated with management directly. We thank management and staff of the Investments and Legal divisions for their courtesy and cooperation extended to us during the review.

Sincerely,

Anthony Chavez, CIA, CGAP, CRMA
Director, Internal Audit Division

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OBJECTIVE

The overall objective of the audit was to determine whether the Hedge Fund investment program is effectively designed and operating to meet ERS' investment goals and objectives.

Investment Selection:

a) Are individual investments aligned with the hedge fund strategic plan?

b) Are investment fees competitive with industry standards?

c) Is investment liquidity consistent with hedge fund management's targets?

Ongoing Operations:

a) Are quantitative risk characteristics of hedge funds monitored at both the fund and portfolio level?

b) Do hedge fund investments remain within the parameter constraints and allocations as set by the Board of Trustees?

c) Are investment fees managed in accordance with contractual rates?

Performance Reporting:

a) Do benchmarks reflect the goals and objectives of the hedge fund program?

b) Is hedge fund performance accurately provided to stakeholders?

CONCLUSION AND SUMMARY RESULTS

OVERALL ASSESSMENT		Satisfactory
SCOPE AREA	**RESULT**	**RATING**
Investment Selection	Based on the audit scope areas reviewed, internal controls are effective, efficient and sustainable, and fully address significant risks related operational execution and regulatory compliance.	**Satisfactory**
Ongoing Operations	Observation #2: Monitoring of performance versus peer group hedge funds not performed (Moderate)	**Satisfactory**
Performance Reporting	Observation #1: Certain information provided to key decision makers and stakeholders is not accurate (Moderate)	**Satisfactory**

BACKGROUND

ERS's Hedge Fund Program was created in 2012 to provide diversification to the Trust with returns that are relatively uncorrelated with other asset classes. The objectives of the System's Hedge Fund Program are:

(1) to preserve the System's capital

(2) to enhance the System's Total Portfolio risk-adjusted returns

(3) to further diversify the System's Total Portfolio

(4) to reduce the System's Total Portfolio volatility.

To meet these goals, the program utilizes three portfolios: Absolute Return, Directional Growth, and Special Situations. These portfolios either fall under a risk reduction or return-seeking strategy.

Risk Reduction

- Absolute Return Portfolio
  - $1.198 billion (7/31/16)
  - 16 individual hedge fund partnerships
  - Performance target is 3-month T-bill + 400 bps

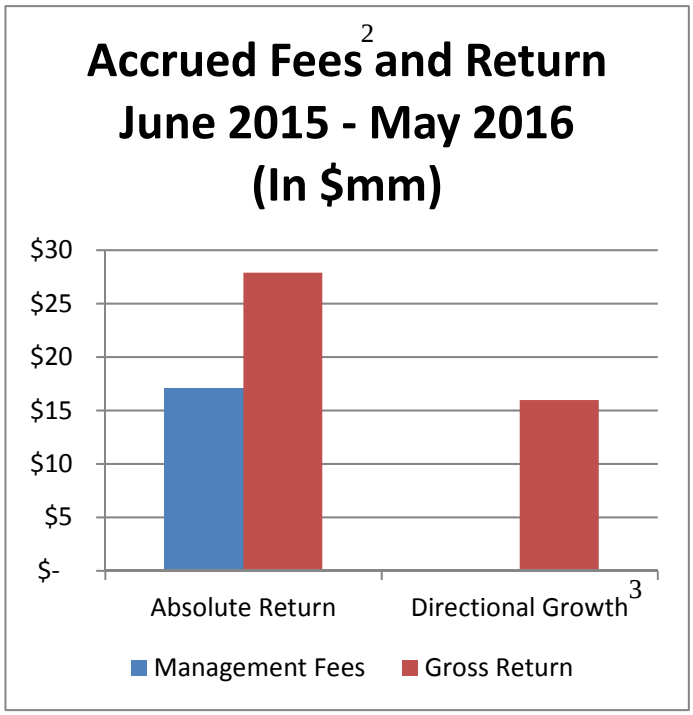
Return-Seeking

- Directional Growth Portfolio
  - One hedge fund
  - $323 million (7/31/16)
  - Performance target is underlying equity indices over a market cycle
- Special Situations Portfolio
  - One hedge fund
  - $102 million (7/31/16)
  - Performance target is long only equity index

The program's value added return is primarily derived from strategy selection. Absolute Return and Directional Growth portfolio's have five available sub-strategies in which funds are allocated in the hedge fund tactical plan. These sub-strategies include Relative Value, Event Driven, Equity Long / Short, Macro, and Opportunistic.

Hedge fund managers are compensated through fund management fees and performance / incentive fees. Management fees are paid for the manager's service, regardless of performance. The program reported that the average management fee paid is 1.09% of the net asset value of funds. Incentive fees are paid to a manager based on a percentage of profits, and are only paid on excess return above a stated benchmark, when the fund's return has achieved a rate of return above a set hurdle rate[1] and high water mark, if applicable. The program's reported estimated average incentive fee is 19.29%. All hedge fund fees are calculated by an independent third party administrator.

1. A hurdle rate (which varies) is the rate of return that the fund manager must exceed before collecting incentive fees. Not all funds have a hurdle rate.



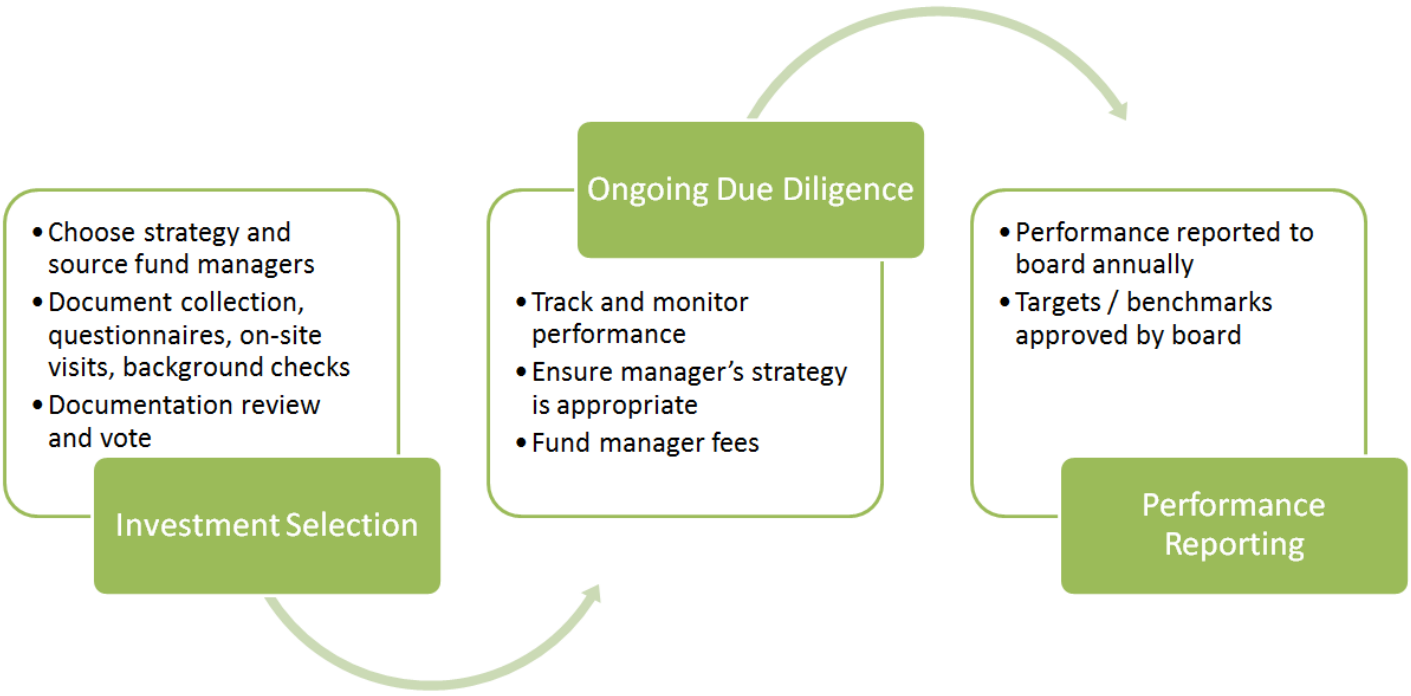
Source: Internal Audit Analysis

Hedge Fund Performance June 2015 - May 2016	
Absolute Return Portfolio	
	12 Month Return
Portfolio Performance	0.04%
90-Day T-Bills + 400 bps	4.53%
HFRI FOF Composite	-5.89%
HFRX Global	-6.99%
Directional Growth Portfolio	
	12 Month Return
Portfolio Performance	0.69%
MSCI ACWI TR index	-5.00%

Source: August 2016 Board Materials

The agency is currently in policy discussions with the Sunset Commission to determine the best method to disclose incentive fees, therefore they were omitted from the chart above. The Investments division plans to report all fees to the Board of Trustees beginning February 2017.

Hedge Fund Program—Key Procedures



2. Only management fees were included in the chart. Incentive fees were omitted from the chart due to reasons stated above

3. Directional growth management fees omitted from the chart due to confidentiality concerns.

SCOPE AND METHODOLOGY

We performed this audit in accordance with the Fiscal Year (FY) 2017 annual audit plan. This audit was carried-over from the Fiscal Year (FY) 2016 audit plan. Internal control activities reviewed include those in place during FY 2015 and at the time of audit fieldwork testing that ended on October 14, 2016.

We conducted this audit in accordance with Generally Accepted Government Auditing Standards and in conformance with the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives.

The audited period covered fiscal years 2015-2016

A defined set of control objectives was utilized to focus on operational goals for the identified scope. The Committee of Sponsoring Organizations of the Treadway Commission Internal Control Integrated Framework. Control was the basis for internal control assessment. Our Internal Audit opinion is an assessment of the condition of the overall control environment based on the effectiveness of internal control activities through the audit period and the degree to which defined control objectives are being met. Our Internal Audit opinion is not a guarantee of operational effectiveness or regulatory compliance, particularly in areas not included in the scope of this audit.

This audit included a review of internal controls considered relevant to audit objectives including review of statutes, policies and procedures, interviews with management and staff, data analysis and testing procedures.

RELATED AUDIT

2015 Financial Opinion Audit—Performed by the State Auditors Office, which covered valuation of hedge funds.

1. Certain information provided to key decision makers and stakeholders is not accurate (Moderate)

The Board of Trustees, Investment Advisory Committee (IAC), and Internal Investment Committee (IIC) are provided information that is necessary for making informed investment decisions. Hedge fund program staff present performance data to the Board of Trustees and IAC at each August board meeting. This data includes performance against benchmarks, correlation, and fee savings among other metrics. The IIC is responsible for making fiduciary investment decisions regarding investments in hedge funds based on information provided by and recommendations offered by hedge fund program staff. Its responsibility includes approving all individual hedge fund investments.

Some data presented to the Board of Trustees and IAC in the August 2015 and August 2016 board meetings was not accurate or source data was not available. 46 metrics were selected from the board materials and tested for accuracy. The following inaccuracies were noted:

- 6 metrics were incorrect by 10-100 basis points
- 6 metrics were incorrect by 100-250 basis points
- 1 metric's supporting data could not be obtained

Performance data was maintained in Excel spreadsheets by the hedge fund program, which led to manual entry errors. Source data for some performance measures showed performance overstated and understated, when compared to what was presented to the board. The hedge fund policy requires the Board to monitor the Hedge Fund Program's progress and results, which cannot be done if performance measurement reports are not accurate. Best practice[4] suggests that internal reporting should be reliable to provide management with accurate and complete information that supports management's decision making and monitoring of the entity's activities and performance.

RECOMMENDATION

The Hedge Fund Program should perform and document a supervisory review of performance data for accuracy before it is presented to the Board and ensure it is retained and can be easily verified.

4. Committee of Sponsoring Organizations (COSO) Internal Control—Integrated Framework

OBSERVATIONS AND RECOMMENDATIONS

MANAGEMENT ACTION PLAN

The performance Excel spreadsheets have currently been phased-out. Backstop had been implemented with the intent to also use it as a shadow reporting system. Backstop already has proven invaluable during the audit process and actually flushed out many of the performance variations relative to simply reviewing data in the Excel file. The further use of Backstop will minimize performance inaccuracies given the program's ability to calculate various performance and risk statistics. As part of the transition of the Hedge Fund program to the Interim Director of Hedge Funds, the expectation is to be fully reliant on Backstop with a review process for all reporting by the end of the fiscal year.

Responsible Position: Hedge Fund Program Director

Implementation Date: 12/31/2016

2. Monitoring of performance versus peer group hedge funds not performed (Moderate)

Hedge fund policy requires that staff to monitor the performance of individual investments versus the Consultant's database of peer group hedge fund investments. This includes quartile rankings, which should be calculated and monitored for each ERS investment over various look back periods and against both broad and sub-strategy hedge fund peer groups. Rankings based on risk adjusted measures (e.g., risk, return, correlation and beta) to ERS' Absolute Return Portfolio and the ERS Trust will be monitored. Reviewing peer performance helps management obtain a robust understanding of individual fund performance.

Inherent Risks

- Key stakeholders are unaware of performance against peer group
- Individual funds may not be performing well versus peer group
- Continued investment in funds that are not performing well relative to peer group

Monitoring of performance versus peer group hedge funds is currently not performed because of limitations in obtaining peer group data. ERS's hedge fund consultant, Albourne, noted that they provide the data needed to perform the required monitoring on a quarterly basis to the hedge fund program.

At the fund level, Staff will monitor the performance of individual investments versus the Consultant's database of peer group hedge fund investments. Quartile rankings will be calculated and monitored for each ERS investment over various look back periods and against both broad and sub-strategy hedge fund peer groups.

-Investment Policy

RECOMMENDATION

To comply with the hedge fund policy, the hedge fund program should develop a process to monitor the performance of individual funds against peer groups. The process should include a supervisory review and required action to address poor performing funds.

OBSERVATIONS AND RECOMMENDATIONS

MANAGEMENT ACTION PLAN

ERS staff has historically reviewed peer comparison information on ERS fund investments in the Absolute Return Portfolio provided by Albourne in monthly risk reports. Staff also conducts formal hedge fund meetings at which valuation reports are frequently discussed along with how individual peers within the industry are performing. What Albourne has traditionally provided regarding broad strategy and sub-strategy quartile rankings has been sufficient in conducting a monthly review of the hedge fund peer universe. Staff has been in compliance to policy requirements with Albourne's reporting.

In an effort to improve the process, ERS staff is in the process of implementing a data feed from Hedge Fund Intelligence (HFI) into Backstop to provide more robust peer comparison. Expectations are for hedge fund staff to create an additional report through Backstop with data from HFI to complement the existing Albourne report. This more extensive peer comparison will be useful in evaluating both ERS existing managers as well as broader universe of managers in sourcing and underwriting.

Contract has been executed with HFI but engagement will be completed later this year. Staff will work with Albourne to ensure the additional reporting reflects a fair representation of the peer universe.

Responsible Position: Hedge Fund Program Director

Implementation Date: 3/31/2017

APPENDIX A—HEDGE FUND STRATEGIES DEFINED

Relative Value

Relative value strategies seek returns by capitalizing on the mispricing of related securities or financial instruments. Generally, relative value strategies avoid taking a directional bias with regard to the price movement of particular securities or markets. Representative relative value strategies include convertible arbitrage, fixed income arbitrage and equity market neutral strategies.

Event Driven

Event driven strategies focus on identifying and analyzing securities that can benefit from the occurrence of an extraordinary corporate transaction or event, e.g., restructurings, takeovers, mergers, spin-offs, bankruptcy. Representative event driven strategies include merger arbitrage, event driven equity and distressed investing.

Equity Long / Short

Equity long/short strategies will maintain some level of market exposure (either net long or net short); however, the level of market exposure may vary through time. This strategy seeks to combine long and short equity positions to benefit from security selection, while offsetting systematic market risk (to varying degrees). Portfolios are typically constructed using a "fundamental, bottom-up approach" encompassing detailed financial modeling, industry research and company due diligence.

Macro

The tactical/directional classification is a catch-all, but generally refers to strategies that are more directional in nature although they can shift opportunistically between those strategies having a directional bias and a non-directional bias. Representative tactical/directional strategies include Global Tactical Asset Allocation ("GTAA") and global macro strategies, where the manager tends to invest at the asset class level such as fixed income, equities and commodities rather than individual corporate securities.

Opportunistic

Opportunistic investments should generally satisfy the following conditions: (1) enhance returns of the hedge fund portfolio, (2) display a positive asymmetric return profile (i.e., upside potential with limited downside), (3) have an identifiable exit point (typically five years or less, likely achieved through investment in a limited-life vehicle structure), and (4) be sourced primarily, though not exclusively, through existing relationships. The investments may be in any sub-strategy or niche strategy, but are likely to result from a market dislocation and display greater illiquidity, beta and volatility than other investments in the hedge fund portfolio. The vehicles may be funded with one-time investments or via a commitment/capital call drawdown mechanism. The opportunistic investments sub-portfolio is not meant to be viewed as a diversified stand-alone portfolio; rather, it is a collection of opportunistic investments with unique characteristics.

ERS

EMPLOYEES RETIREMENT SYSTEM OF TEXAS

ERS INTERNAL AUDIT DIVISON

To provide independent and objective assurance on the effectiveness of controls and operations to meet ERS' strategic direction.

HealthSelect—Prescription Drug Program Audit #2016-04

November 14, 2016

FROM THE DIRECTOR

Internal Audit has completed its HealthSelect—Prescription Drug Program audit at the Employees Retirement System of Texas.

Based on the audit scope areas reviewed, internal controls require improvement in order to provide reasonable assurance that key goals and objectives will be achieved. The current system of internal controls only partially addresses risk factors considered significant to operational execution and compliance. Significant improvements are required to correct the below control gaps that may result in negative impacts to ERS.

1. Controls over accuracy of key information used to manage and evaluate the PBM are not effective. (Significant)
2. PBM performance results should be consistently maintained and communicated. (Significant)
3. Consider additional division control activities to enhance third-party review work (Moderate)

Detailed results and observations are included in subsequent pages. Other matters deemed less significant were communicated with management directly. We thank management and staff of the Benefit Contracts division for their courtesy and cooperation extended to us during the review.

Sincerely

Anthony Chavez, CIA, CGAP, CRMA
Director, Internal Audit Division

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OBJECTIVE

The overall objective of the audit was to determine if contract administration and oversight of the Prescription Drug Program ensures member benefits are properly delivered. The sub-objectives of the audit were:

Performance:

a. Are members receiving benefits in accordance with the Master Benefit Plan Document?
b. Are deliverables submitted timely and accurately in accordance with contract provisions?
c. Is vendor performance accurately reported?
d. Is vendor performance appropriately evaluated and communicated to key stakeholders?

Financial:

a. Are drug claims processed in accordance with Plan design?
b. Are drug costs submitted for reimbursement accurate?
c. Are financial guarantees determined and received in accordance with contract provisions?

CONCLUSION AND SUMMARY RESULTS

OVERALL ASSESSMENT		**NEEDS IMPROVEMENT**
SCOPE AREA	**RESULT**	**RATING**
Performance	1. Controls over accuracy of key information used to manage and evaluate the PBM are not effective. (Significant) 2. PBM performance results should be consistently maintained and communicated. (Significant) 3. Consider additional division control activities to enhance third-party review work. (Moderate)	**NEEDS IMPROVEMENT**
Financial	1. Controls over accuracy of key information used to manage and evaluate the PBM are not effective. (Significant) 3. Consider additional division control activities to enhance third-party review work. (Moderate)	**NEEDS IMPROVEMENT**

BACKGROUND

ERS contract management adheres to requirements set forth by the State of Texas Contract Management Guide and the State of Texas Procurement Manual both published by the Texas Comptroller of Public Accounts. Contract management monitors the vendor's progress against the contract guidelines and maintains records supporting performance.

"Contracting" or "Contract Management" refers to the entire contract management cycle. Each contracting element has its own unique risks and related control activities subject to audit. This audit engagement's primary focus was on contract oversight activities over the *HealthSelect* Prescription Drug Program.

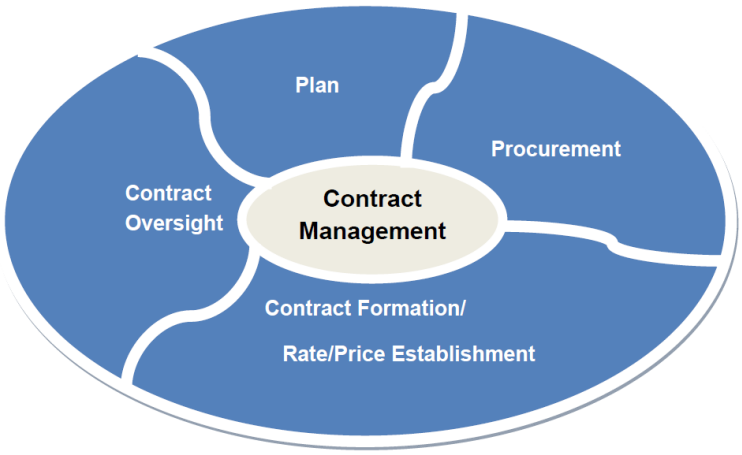
Contracting Elements

Plan—Identifying contracting objectives and strategy

Procurement—Selection of a vendor to provide goods and services

Contract Formation—Ensures contract contains provisions holding the contractor accountable for desired results

Contract Oversight—Monitor and enforce the terms of the contract



HEALTHSELECT PRESCRIPTION DRUG PROGRAM

HealthSelect is a statewide self-funded plan providing health insurance for participants and their eligible dependents. The Prescription Drug Program provides prescription drugs to HealthSelect participants and is administered by Caremark Rx, LLC a pharmacy benefit manager.

A Pharmacy Benefit Manager (PBM) is a third-party administrator of prescription drug programs and is responsible for developing and maintaining the formulary, contracting with pharmacies, negotiating discounts and rebates with drug manufacturers, and processing mail order services, specialty pharmacy services and paying prescription drug claims.

The PBM assists ERS in developing the plan's formulary and utilizes pharmaceutical expertise to recommend cost-containment measures like prior authorizations and step therapy.

PBM Functions

- *Formulary maintenance*
- *Maintain pharmacy network*
- *Negotiate discounts and rebates with drug manufacturers*
- *Processing drug claims*
- *Drug trend analysis*
- *Member utilization*

CONTROLS OVER DRUG COSTS

The total cost of a prescription drug is derived from various fees and discounts. When a member receives a prescription they pay a copay to the pharmacy. The pharmacy invoices the PBM the cost of the drug plus a dispensing fee for the pharmacists time and services, less the copay amount. The PBM pays the pharmacy and then invoices ERS weekly. Quarterly the PBM provides a reconciliation of rebates paid to contractually expected fees, and will submit additional payments to ERS as necessary.

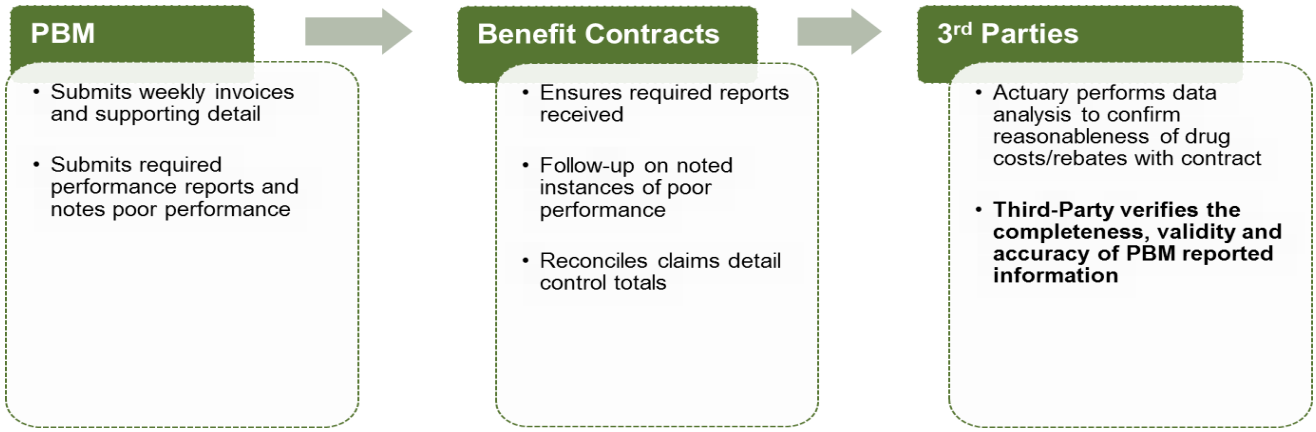
	FY2014	FY2015	FY2016
Number of Claims	5,903,824	5,791,701	5,796,036
Cost of Claims Paid	$480,143,909	$540,601,452	$586,028,106

ERS utilizes the expertise of the actuary firm Rudd & Wisdom to review discounts and rebates received from the PBM are accurate. Rudd & Wisdom performs analysis on claims invoices, quarterly rebates and guaranteed discounts on a continuous basis. Auditors noted several instances where the actuary identified a costing issue and notified ERS.

Inherent Risks

- *Published price of drugs is not reflective of the actual price paid by PBM to manufacturer*
- *Increasing prescription drug costs*
- *Conflicting financial relationships between drug manufacturers, PBM and pharmacy*
- *Lack of transparency of the PBM's pharmacy contracts*
- *Limited transparency of actual costs within the drug supply chain*
- *Lack of clarity in the PBM's drug pricing algorithm*
- *Limitations on access to data*

PRESCRIPTION DRUG PROGRAM—CONTROL DESIGN EVALUATION



The flowchart above explains the process of how the PBM's performance is reported and monitored. The PBM submits required performance reports to Benefit Contracts on a scheduled timeline. Benefit Contracts retains the reports. If poor performance is reported, account management will follow up to determine if action should be taken. A third-party is contracted with ERS and is responsible for verifying the reports received throughout the year are complete, valid and accurate through an audit performed annually. The third-party review is the **key control** in validating PBM submitted information for accuracy and completeness.

SCOPE AND METHODOLOGY

We performed this audit in accordance with the Fiscal Year (FY) 2016 annual audit plan. Internal control activities reviewed include those in place during FY 2015 and at the time of audit fieldwork testing that ended on August 8, 2016. Audit coverage over the Prescription Drug Program contract included the monitoring and oversight process only.

We conducted this audit in accordance with Generally Accepted Government Auditing Standards and in conformance with the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives.

Audit work covered the contract oversight process within the Benefit Contracts division

A defined set of control objectives was utilized to focus on operational goals for the identified scope. The Committee of Sponsoring Organizations of the Treadway Commission Internal Control — Integrated Framework Control was the basis for internal control assessment. Our Internal Audit opinion is an assessment of the condition of the overall control environment based on the effectiveness of internal control activities through the audit period and the degree to which defined control objectives are being met. Our Internal Audit opinion is not a guarantee of operational effectiveness or regulatory compliance, particularly in areas not included in the scope of this audit.

This audit included a review of internal controls considered relevant to audit objectives including review of statutes, policies and procedures, interviews with management and staff, data analysis and testing procedures.

Monitoring and oversight functions outside the Benefit Contracts Division were not part of the scope of this engagement and separate audit engagements have or will be performed over those areas.

RELATED AUDITS

Internal Audit Report 2016-02 Group Benefits Program Procurement Follow-up (May 2016)

SAO Report 15-007 HealthSelect Contract at the Employees Retirement System (November 2014)

Internal Audit Report 2014-03 Legal Services Contract Administration (May 2014)

Internal Audit Report 2013-02 Group Benefits Program Procurements (August 2013)

OBSERVATIONS AND RECOMMENDATIONS

1. Controls over accuracy of information used to manage and evaluate the PBM are not effective. (Significant)

To provide assurance over the accuracy of the PBM's financial and performance information, a third-party has been engaged to assist process owners in reviewing and testing information for accuracy. Currently this control activity is not effective in providing reasonable assurance over accuracy of key information used to manage and evaluate the PBM.

Review of current processes and associated third-party audit documents[1], identified no controls over the appropriateness and sufficiency of work performed by the third party. This led to control gaps in testing of key attributes, inconsistencies in reported results, deviations from contract provisions and ambiguity over review methodology and procedures. Although the Contract Management Guide allows third-party reviews, accountability for appropriateness of review activities remains with process owners. Specifically the following control breakdowns were identified:

> *Management that delegates through contractual arrangements the execution of certain activities to outsourced service providers retains ultimate accountability for those activities—COSO*

<u>No clear and concise third-party review objectives and associated procedures</u>. Review of approved audit plan identified review procedures were general in nature and did not specifically identify attributes to be tested. This led to the following control gaps:

- Key drug claim attributes not tested and verified for accuracy including:
  - ◊ Drug claims paid only for eligible participants - *Analysis of drug claims submitted for reimbursement in March 2014 identified 630 individuals that were not on ERS drug program participant roles for a total cost of $63,000.*
  - ◊ No duplicate submission of drugs claims for reimbursement to the PBM
  - ◊ Timeliness of drug claims processed and submitted for reimbursement
  - ◊ Proper collection of copayment by pharmacy
- Drug claims population reported as reviewed and tested is incomplete. Reconciliation between reported claims reviewed by third-party and claims submitted to ERS for reimbursement were understated by 93,000 claims for a total of $4 million.
- Performance Guarantees (PG) are not reviewed for accuracy. Performance Guarantees are obligations contractually agreed upon between ERS and the PBM. Account management receives and maintains the PG reports, but relies on the third-party to validate the accuracy during the annual audit. The PG review process did not include:
  - ◊ Requesting or testing data that supports the PG results
  - ◊ Recalculation of formulas
  - ◊ PBM provided PG reports used in review
  - ◊ Telephone and in person conversations held with the PBM to discuss PG metrics
  - ◊ Documentation supporting conclusions made on PG performance

> ***Performance Guarantees***
>
> Performance Guarantees are the primary practice used to document and evaluate PBM performance. The PBM self-reports performance in 20+ areas periodically throughout the fiscal year. Each performance guarantee has its own calculation methodology and support.

1. Fiscal Year 2014 third-party audit report, the FY14 Audit Report, approved Audit Plan and the third-party audit services contract

- Deviations from third-party audit services contract including:
    - ◊ Third-party audit work not performed, nor reported, under Generally Accepted Auditing Standards. Although performing work under audit standards is not a requirement of the Contract Management Guide, audit standards help ensure sufficient procedures are performed to provide reasonable assurance of areas reviewed.
    - ◊ Payments to the third-party did not match services provided. ERS was billed at a service level of 100% of claims being tested, although less than 1% of claims were reviewed.

Review of the third-party report does not effectively resolve issues reported or identify inconsistencies in work performed. Final results of third-party work are submitted to process owners for review. Although process owners indicated a review is performed, review results are not documented or maintained. Review of FY14 final report accepted by process owners identified the following:

- Reported results over PGs did not include any observations related to FY14, but did report on FY13 and FY15 performance. Reported results included similar language as reported in the FY13 audit report. The PBM self-reports performance and no additional work other than the third-party review is conducted to verify accuracy of results. For FY14 the PBM self-reported all PGs were met.
- Total amount of FY14 rebates reported as received varied within sections of the third-party report. The differences in reported total rebates was approximately $1.2 million. Rebates significantly reduce total drug costs incurred by ERS. Because of the confidential nature of rebates, substantial reliance is placed on third-party assurance provided over rebate accuracy.
- Reported findings not further reviewed or evaluated for final resolution. Third-party audit reported 237 claims totaling $614,230 were improperly adjudicated. Although the PBM provided rationale as to cause of the error, there is no evidence the process owners evaluated the error for reasonableness and satisfaction. PBM noted it would credit $6,754 and this was accepted by process owners. See observation #2 for further information.

Key Considerations for relying on Third-Party audits

- *Confirm the type of report, its purpose and its scope*
- *Validate the external audit firm is sufficiently qualified, objective and independent*
- *Evaluate the coverage within the report in relation to the areas of concern based on risk*
- *Verify the audit firm has procedures to document internal control monitoring and testing procedures, including supervisory review*
- *Ensure compliance with industry, governmental and other regulatory requirements are maintained*

RECOMMENDATIONS

The Benefit Contracts Division should develop greater controls over the management of third-party reviews including:

- Determine and communicate key objectives of the third-party review
- Work with the third-party to identify high-risk areas that may need enhanced testing/oversight
- Work with third-party to formalize and approve a detailed review plan that specifically identifies attributes to be tested and procedures to confirm the completeness of data provided directly by the PBM
- Evaluate if any proposed third-party procedures could be performed internally including the documentation of additional benefit obtained by having a third-party perform
- Develop a quality control checklist to assist in evaluating results of work performed including sufficiency of third-party reported results, acceptance of PBM responses to those results and third-party contract compliance
- Evaluate assurance provided by third-party review to ensure efforts are not duplicated with other areas such as internal analysis and insurance actuary work.

MANAGEMENT ACTION PLAN

Benefit Contracts staff uses a multi-faceted approach for oversight of vendor performance. This includes ongoing oversight and interaction between the vendor and ERS' internal account managers and contracts with an independent third-party auditor. All of these compliance monitoring activities are designed to work together to formulate a comprehensive compliance strategy.

Staff will continue to work to improve the clarity of the controls utilized in the management of third-party reviews, including clarifying the processes employed to review, define, approve, and thoroughly document the scope and objectives of each third-party review. From the pre-audit conference with the independent auditor, staff works closely with the third-party auditor to define scope based on risk, prior period audit findings, market changes, and other issues that pose a risk for which a benefit would be derived from an independent review.

While the Benefit Contracts division has enforce procedures specific to the compliance monitoring strategies utilized (ACCT MGMT-001 Contract Management Strategy), internal tools for monitoring vendor performance (ACCT MGMT-002 Deliverables Review Schedule, ACCT MGMT-003 Contract Deliverables Index, ACCT MGMT-005 Compliance and Service Issues, ACCT MGMT-007 MAPR, ACCT MGMT-008 Source Document Review, ACCT MGMT-011 Managing Performance Guarantees), and management of third-party reviews (ACCT MGMT-016 External Compliance Audits, ACCT MGMT-017 Compliance Audit Recommendations), the division's documentation could have been clearer on how audit engagements are to be managed as part of the division's overall compliance strategy.

Staff will continue to improve its process to review the work performed by the third-party. Improvements to this process will include evidence that the audit report findings are reviewed by internal stakeholders and divisional management; divisional management's acceptance that the report aligns with the approved audit scope; and divisional management's acceptance of PBM responses to the noted findings. Additionally, staff will continue to improve documentation of additional procedures performed to ensure third-party efforts are not duplicated within other areas of the agency.

Responsible Position: Georgina Bouton, Assistant Director
Nora Alvarado, Manager

Implementation Date: March 1, 2017

2. PBM performance results should be consistently maintained and communicated. (Significant)

The Pharmacy Benefit Manager's (PBM) performance is evaluated by 20-plus Performance Guarantees (PGs) in the areas of account management, customer service, operations and systems management. Each performance guarantee has a report timetable, assigned level of severity and fee assessment for not meeting thresholds. Review identified all performance guarantee reports were submitted timely by PBM and properly tracked by process owners. However performance results were not always properly updated and formally communicated. Specifically the following were identified:

Historical performance results are not consistently updated and maintained. Historical data allows an agency to track actual performance against targets and expectations, and provides insight into how the vendor performed in past periods under varying conditions.

- Performance Guarantees were not always recalculated or reevaluated based on errors identified in the FY14 third-party audit. Although errors were not specifically identified by the third-party audit related to PGs, errors related to information used in developing PGs were identified. Process owners and PBM did acknowledge the errors but PG results were not updated to determine impact on performance results. There is no process requiring the PBM to resubmit reporting information (PGs) after errors have been identified.
- The Electronic Retail Adjudication report (severity moderate) received monthly from the PBM uses outdated metrics to measure performance. The FY15 change from 21 calendar days to 15 business days to adjudicate was not reflected on the PBMs reports.

Performance assessment decisions not always communicated to stakeholders. COSO states the responsibility and accountability of performance resides with management. Management has established performance guarantees to assist in assessing PBM performance. For each performance guarantee, an assessment schedule is assigned based on severity when performance benchmarks are not obtained. *(See Table A page 10)* Final assessment imposed is based on contract management discretion to allow for other considerations and a comprehensive evaluation of the vendor.

The frequency and level of detail of communication between management and the board of directors must enable the board to understand the results of management's separate and ongoing assessments and the impact of those results on the achievement of objectives—COSO

Review of performance guarantees for fiscal years 2015-2016 identified six guarantees that did not meet established benchmarks. Four of the six were fully assessed per the fee schedule for a total assessment of $740,000. For one performance guarantee (severity minor), scheduled fee assessment was reduced by $20,000. For the second performance guarantee (severity moderate), no fee was assessed on a scheduled fee assessment of $120,000. Although support was maintained to document management decisions, no formal written communication was provided to key stakeholders including executive management.

Formal communication of management decisions to executive management and Board of Trustees helps to ensure objectives are achieved in a manner consistent with stakeholder expectations. In addition, it helps to validate ERS' organizational governance to external stakeholders.

TABLE A

Performance Guarantee Assessment Schedule	
Level of Severity	**Assessment Amount at Risk**
Severity 1 - Emergency	50% of aggregate annual amount at risk for each occurrence $2,000,000
Severity 2 - Critical	25% of aggregate annual amount at risk for each occurrence $1,000,000
Severity 3 - Moderate	Occurrence 1 = 3% of aggregate annual amount at risk $120,000 Occurrence 2 = 5% of aggregate annual amount at risk $200,000 Occurrence 3 = 6% of aggregate annual amount at risk $240,000 Occurrence 4 = 9% of aggregate annual amount at risk $360,000
Severity 4 - Minor	2% of aggregate annual amount at risk for each occurrence $80,000

Source: *PBM / ERS Contract*

RECOMMENDATIONS

The Benefit Contracts division should evaluate procedures for the administration of PBM performance guarantees including:

- Formalize communication to key stakeholders of Performance Guarantee assessments received and/ or waived
- Ensure Performance Guarantee reports are properly updated when changes to methodology occur
- Resubmission and reevaluation of Performance Guarantee results to determine impact when issues and/or errors are identified
- Maintain historical records that match the PBM's actual performance

MANAGEMENT ACTION PLAN

ERS staff will continue to assess and improve its documentation of internal monitoring procedures to ensure that the processes employed with respect to stakeholder communication, Performance Guarantee reports and retention of historical records are clearly represented. It is important to note that all compliance documentation managed by the Benefit Contracts staff is subject to and in compliance with the agency's record retention schedule.

Benefit Contracts staff provides an overview of the monitoring strategy and results of the compliance monitoring employed and documented through the MAPR to ERS' Board of Trustees each December. As part of this presentation, staff presents the annual compliance findings and reports to the Board the status of performance guarantees assessed and waived. This is done in a public hearing as a means to advocate transparency in compliance reporting for stakeholder group to include GBP membership, as a whole. The agenda item, visual presentation (PowerPoint), as well as a video of the presentation, are part of the agency's public records and are subject to the agency's record retention schedule.

Staff manages a historical listing of performance guarantees assessed, performance guarantee assessment waivers, liquidated damage assessments and audit recoveries by plan year for all of the GBP and Deferred Compensation program vendors. This information has been provided to ERS' Office of Procurement and Contract Oversight to serve as a model for formulating agency-wide reporting to the Executive Office for all of the agency's activities regarding contract assessments and waivers.

Staff will continue to identify opportunities to strengthen its overall compliance monitoring processes and will more clearly document the processes employed with respect to the management and reporting of Performance Guarantee assessments and waivers.

Responsible Position: Georgia Bouton, Assistant Director
Nora Alvarado, Manager

Implementation Date: January 2, 2017

3. Consider additional division control activities to enhance third-party review work (Moderate)

Process owners rely substantially on the third-party audit to ensure the accuracy of submitted information. The impact of third-party control gaps would be minimized by having additional control activities maintained internally. Management should implement internal control activities to leverage subject matter expertise and available data including:

Conduct analysis real-time. Rebates and guaranteed discounts are continuously evaluated by ERS staff and the actuary, but analysis of the claims data that creates these financial transactions is limited. Control activities over claims data that can be performed in-house is deferred to the third-party with reports completed a full year after the fiscal year has ended. This time lag inhibits monitoring current effectiveness and quality of services. Conducting analysis real-time would allow:

- Continuous review of key claim components—As stated in observation #1, many key attributes are not being reviewed by the third-party. Reviewing claim attributes by process owners would eliminate these control gaps, and would allow updates when errors are occurring. Analysis was performed on claims data from August 2016 and identified 730 individuals that were not eligible to receive benefits for a total cost of $77,000.
- Trend identification and analysis—Reviewing effects of drug pricing, utilization and the mix of brand and generic drugs as well as the effect of negotiated rebates on overall trend would help sample selection for the third-party review. Currently claim testing is based on a random sample. Data analysis would enable testing on claims more susceptible to error and with a larger impact to the prescription drug program.
- Review performance and member experience—Some areas of the third-party review could be performed by process owners, including:
    - ◊ Validating accuracy of some performance guarantees
    - ◊ Analysis of required insurance and other administrative items are kept up to date
    - ◊ Service Organization Control (SOC) - review reports to identify controls that are not being performed by the PBM that need additional follow-up and are an interest to ERS
    - ◊ Receive detailed interaction log from PBM to understand types of issues and questions raised by members when contacting customer service

RECOMMENDATION

The Benefit Contracts division should identify and assess areas that can be actively monitored by process owners to reduce reliance on the third-party.

MANAGEMENT ACTION PLAN

Benefit Contracts management will evaluate how best to utilize the Underwriting, Data Analysis, and Reporting (UDAR) team in identifying and assessing areas that can be actively monitored by the UDAR staff thereby reducing reliance on the third-party auditor.

Responsible Position: Robert Kukla, Director
Georgina Bouton, Assistant Director
Blaise Duran, Manager

Implementation Date: February 1, 2017

ERS
EMPLOYEES RETIREMENT SYSTEM OF TEXAS

200 E. 18TH STREET, AUSTIN, TEXAS 78701 | P. O. BOX 13207, AUSTIN, TEXAS 78711-3207 | (877) 275-4377 TOLL-FREE | WWW.ERS.STATE.TX.US

October 24, 2016

Members of the ERS Board of Trustees
Mr. Porter Wilson, Executive Director
Mr. Tom Tull, Chief Investment Officer

Re: Quarterly Investment Agreed-upon Procedures

Internal Audit has completed quarterly procedures to test compliance with ERS' Investment Policy in accordance with the Fiscal Year 2016 Annual Audit Plan.

We have performed the procedures listed in the attached Appendix A, which were agreed to by ERS management, to assist in monitoring Investment Policy compliance for the quarter ended September 30, 2016. This agreed-upon procedures engagement was performed in accordance with generally accepted government auditing standards contained in the Government Auditing Standards issued by the Comptroller General of the United States. The sufficiency of these procedures is solely the responsibility of those parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

We were not engaged to and did not conduct an examination, the objective of which would be to determine whether internal controls are effectively designed and operating to comply with ERS' Investment Policy. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the information and use by the Board of Trustees and ERS management, and is not intended to be and should not be used by anyone other than the specified party. This report is a matter of public record and its distribution is not limited.

Sincerely

Anthony Chavez, CIA, CGAP, CRMA
Director, Internal Audit Division

APPENDIX A – AGREED-UPON PROCEDURES AND RESULTS
Independent Audit Review

Portfolio Compliance – *Proper Investment risk maintained based on approved investment strategy and asset allocation*		
Procedures Agreed-Upon	Finding Description	Management Response
Investment Custodian Bank *Diversification Reports* reviewed to ensure beneficial ownership in a single security is within Investment Policy diversification thresholds.	No exceptions were found as a result of applying this procedure.	Noted
Investment Custodian Bank *Fixed Income Quality Reports* reviewed to ensure fixed income and short-term securities credit ratings above Investment Policy limits.	No exceptions were found as a result of applying this procedure.	Noted
FactSet *Daily Tracking Error Reports* reviewed to ensure risk tolerance within established constraints per Investment Policy.	No exceptions were found as a result of applying this procedure.	Noted
Review the daily report provided by BNY Mellon to identify instances of investments in prohibited countries.	No exceptions were found as a result of applying this procedure.	Noted

APPENDIX A – AGREED-UPON PROCEDURES AND RESULTS
Independent Audit Review

Personal Trading – *Employees may not have an interest in or financial gain from investments by ERS*		
Procedures Agreed-Upon	Finding Descriptions	Management Responses
At quarter-end, Covered Persons list pulled from personal trading system and compared to designated Covered Persons division listing for completeness.	No exceptions were found as a result of applying this procedure	Noted
Covered Persons personal brokerage trading confirmations reconciled to compliance system executed personal trades for completeness.	No exceptions were found as a result of applying this procedure	Noted
Reported compliance system executed trades reviewed to verify existence of pre-approval from designated party.	No exceptions were found as a result of applying this procedure	Noted
Confirm all quarterly affirmations to be submitted by Covered Persons affirming understanding of Investment Policy personal transactions rules including submission of all required personal trading information.	No exceptions were found as a result of applying this procedure	Noted

APPENDIX A – AGREED-UPON PROCEDURES AND RESULTS
Independent Audit Review

Proxy Voting – *Votes should be cast in accordance with ERS' economic best interest*		
Procedures Agreed-Upon	Finding Description	Management Responses
Review Institutional Shareholder Services (ISS) system *Un-voted Report* for missing votes.	No exceptions were found as a result of applying this procedure	Noted
Review Institutional Shareholder Services (ISS) system Voted Against Report for votes made against ERS proxy voting guidelines. Verify any votes against ERS guidelines are appropriately documented as to rationale.	No exceptions were found as a result of applying this procedure	Noted

APPENDIX A – AGREED-UPON PROCEDURES AND RESULTS
Independent Audit Review

Securities Lending – *Lendable securities base and individual securities are not under-collateralized or over-utilized per program policies*		
Procedures Agreed-Upon	Finding Description	Management Responses
Review the monthly *Securities Lending and Performance Summary* to ensure the ERS utilization rate for Securities Lending is below 25% of the lendable base.	No exceptions were found as a result of applying this procedure.	Noted
Review the daily report provided by Deutsche Bank to identify instances of collateralization falling below 100% based on end-of-day market values.	No exceptions were found as a result of applying this procedure.	Noted
Review the daily report provided by Deutsche Bank to identify instances where more than 95% of any single security is loaned out.	No exceptions were found as a result of applying this procedure.	Noted
Review the daily report provided by Deutsche Bank to identify instances where the rebate rates for loans are above the Federal Funds Open rate.	No exceptions were found as a result of applying this procedure.	Noted
Review the daily report provided by Deutsche Bank to identify instances where counterparties are above the 10% diversification limit for Eurozone borrowers.	Three instances were identified during the quarter where the diversification limit for Eurozone counterparties was above 10%. Two of the three instances were resolved within two business days. The third instance was resolved within fourteen business days.	See **Appendix B** for further details
Review the daily report provided by Deutsche Bank to identify instances where counterparties are above the 20% diversification limit for non-Eurozone borrowers	Thirteen instances were identified during the quarter where the diversification limit for non-Eurozone counterparties was above 20%. Five Instances went unresolved for fourteen, nine, seven, six, and five consecutive business days. All other instances were resolved within three business days.	See **Appendix B** for further details

APPENDIX B – SECURITY LENDING PROGRAM SUSPENSION

Impact to Investment Compliance Monitoring

Beginning in January 2016, the credit default swap (CDS) spread, an indicator of solvency risk, began to rise sharply for ERS's securities lending counterparty, Deutsche Bank. The spread continued to increase dramatically into February 2016, which caused the Securities Lending program to be temporarily suspended. Investments Division does not believe that Deutsche Bank will face any solvency issues, but they determined that the returns the securities lending program generates were not worth the risks. The recall was done in steps, first causing the borrowed exposure to decrease from $400 million to $26 million in February, with the last borrowed security returning at the beginning of April. Since the total number of borrowed securities decreased significantly, daily audit flags were triggered from February to the end of September 2016 for the diversification limits in the Investment Compliance Program.

On April 22 of 2016, the securities lending program began lending ETF's only. Since then, the program has been deliberately run at a low utilization rate, which has caused audit flags for diversification limits through September 2016.

PUBLIC AGENDA ITEM -#11b

Presentation, Discussion and Consideration of Audit Committee Agenda Items:

11b. Internal Audit Administrative Items

December 2, 2016

BACKGROUND:

External Peer Review

Government Auditing Standard 3.82b requires the Internal Audit Division to have an external peer review performed by independent reviewers at least once every three years. The results of the external peer review are presented for discussion and included in this agenda item as Exhibit A and Exhibit A.1

Fiscal Year 2016 Internal Audit Performance Metrics

The ERS Audit Committee is responsible for oversight of the Internal Audit Division. This agenda items presents the Fiscal year 2016 performance measures which are included as Exhibit B.

Fiscal Year 2016 Internal Audit Annual Report

The Texas Internal Auditing Act, Texas Government Code, Chapter 2012, requires certain agencies and higher education institutions to submit an internal audit annual report each year to the Governor, the Legislative Budget Board, the Sunset Advisory Commission, the State Auditor's Office (SAO) and the entity's governing boards and chief executives. SAO is charged with prescribing the form and content of the annual plan. The ERS Fiscal Year 2016 Internal Audit Annual Report is included in this agenda item as Exhibit C.

STAFF RECOMMENDATION:

These agenda items are presented for discussion purposes only. No action is required.

ATTACHMENTS –

Exhibit A – External Peer Review

Exhibit A.1 – External Peer Review Summary

Exhibit B – FY2016 Internal Audit Performance Metrics

Exhibit C - FY2016 Internal Audit Annual Report

Report on the External Quality Assurance Review of the Employees Retirement System of Texas Internal Audit Division

November 2, 2016

Performed by

Amy Barrett
Chief Audit Executive
Teacher Retirement System of Texas

Rene Valadez
Director of Internal Audit
Office of the Governor

Performed in Accordance with the
State Agency Internal Audit Forum
Peer Review Policies and Procedures

Overall Opinion

Based on the information received and evaluated during this external quality assurance review, it is our opinion that the Employees Retirement System of Texas Internal Audit Division (the "Internal Audit Division") receives a rating of "**Pass/Generally Conforms**" and is in compliance with the Institute of Internal Auditors (IIA) *International Professional Practices Framework* and Code of Ethics, the United States Government Accountability Office (GAO) *Government Auditing Standards*, and the Texas Internal Auditing Act (Texas Government Code, Chapter 2102). This opinion, which is the highest of the three possible ratings, means that policies, procedures, and practices are in place to implement the standards and requirements necessary for ensuring the independence, objectivity, and proficiency of the internal audit function.

We found that the Internal Audit Division is independent, objective, and able to render impartial and unbiased judgments on the audit work performed. The staff members are qualified, proficient, and knowledgeable in the areas they audit. Individual audit projects are planned using risk assessment techniques; audit conclusions are supported in the working papers; and findings and recommendations are communicated clearly and concisely.

The Internal Audit Division is well managed internally. In addition, the Internal Audit Division has effective relationships with the Board and is well respected and supported by management. Surveys and interviews conducted during the quality assurance review indicate that management considers the Internal Audit Division to be a useful part of the overall organization's operations and finds that the audit process and report recommendations add value and help improve the organization's operations.

Acknowledgements

We appreciate the courtesy and cooperation extended to us by the Internal Audit Director, Internal Audit staff, the Chair and Audit Committee Chair of the Board of Trustees, the Executive Director, and executives who participated in the interview processes. We would also like to thank each person who completed surveys for the quality assurance review. The feedback from the surveys and the interviews provided valuable information regarding the operations of the Internal Audit Division, its relationship with management, and compliance with auditing standards.

Amy L. Barrett
Chief Audit Executive
Teacher Retirement System of Texas
SAIAF Peer Review Team Leader

Rene Valadez
Director of Internal Audit
Office of the Governor
SAIAF Peer Review Team Member

Background

The Institute of Internal Auditors (IIA) *International Professional Practices Framework*, U.S. Government Accountability Office (GAO) *Government Auditing Standards*, and the Texas Internal Auditing Act require that internal audit functions obtain external quality assurance reviews to assess compliance with standards and the Act and to appraise the quality of their operations. Government auditing standards require these reviews at least every three years. A periodic external quality assurance review, or peer review, of the internal audit function is an essential part of a comprehensive quality assurance program. This quality assurance review was performed in accordance with State Agency Internal Audit Forum (SAIAF) Peer Review guidelines.

The most recent quality assurance review for the Employees Retirement System of Texas Internal Audit Division was performed in October of 2013. The Internal Audit Division completed its implementation of the recommendations made in that report.

Objectives, Scope, and Methodology

The primary objective of the quality assurance review was to evaluate the Employees Retirement System of Texas Internal Audit Division's compliance with auditing standards and the Texas Internal Auditing Act. Additional objectives included identifying best practices as well as areas where improvement may be needed. The review covered all completed audit and management assistance projects performed by the organization's Internal Audit Division from November 1, 2013 through October 31, 2016, with emphasis placed on projects completed during fiscal year 2016.

The work performed during the review included:

- Review, verification, and evaluation of the self-assessment prepared by the Internal Audit Division according to SAIAF guidelines.
- Review and evaluation of surveys completed by 13 members of management.
- Interviews with the Internal Audit Director, Internal Audit Division staff, the Executive Director, two executives, and two trustees, including the Chair of the Board and the Chair of the Audit Committee.
- Review and evaluation of audit working papers.
- Review of Internal Audit's policies and procedures, annual risk assessment, annual audit plan, and other relevant documents.

Detailed Results

The results of the quality assurance review for the Employees Retirement System of Texas Internal Audit Division are presented in the order of the *Standards for the Professional Practice of Internal Auditing.* No significant weaknesses were identified during the review that would prevent the Division from fulfilling its responsibilities. The detailed results include identification of best practices as well as some opportunities for improvement that the Internal Audit Division may wish to consider.

IIA Code of Ethics

Internal Audit demonstrates its commitment to the IIA *Code of Ethics* by including it in the *Internal Audit Policies and Procedures Manual*, attending periodic ethics training classes, and practicing ethical behavior in the course of daily work. In addition, the agency's *Ethics Policy* and fraud hotline are indications of an organization-wide commitment to accountability and integrity.

Purpose, Authority, and Responsibility

The purpose, authority, and responsibility of Internal Audit have been defined in a charter that is consistent with auditing standards. The current charter was signed by the Board and the Executive Director in February 2016. It defines the nature of audit and consulting services and grants the Internal Audit Division unrestricted access to agency records, property, and personnel.

Independence and Objectivity

The Internal Audit Division is independent both in terms of the agency's organizational structure and the Division's practices. The Internal Audit Director reports directly to the Board, which provides sufficient authority to promote independence and to ensure adequate consideration of audit reports and appropriate action on audit issues and recommendations. Removal of the Internal Audit Director requires Board approval.

The charter helps ensure continued independence by specifying that internal auditors must remain free of operational and management responsibilities that could impair their ability to make independent reviews of all areas of the agency's operations. None of the internal auditors has had prior responsibility for any areas that the Division audits. In addition, auditors are required to sign independence statements annually and for each audit they perform.

Opportunity for Improvement:

1. While the auditors have assessed and evidenced their independence, auditing standards require that auditors formally assess threats to independence and safeguards in place to mitigate those threats. For example, if auditors participate in committees, a safeguard would be that they are in a non-voting capacity and cannot make management decisions. We recommend that the Internal Audit Director document this assessment and use it as the basis for the annual assertion of independence to the Audit Committee.

Director's Response:

1. Agree. Potential threats to independence including corresponding safeguards will be formally documented and maintained to support Internal Audit's annual independence confirmation to the Board at August Audit Committee meetings.

Proficiency and Due Professional Care
The internal auditors individually and collectively possess the knowledge, skills, and abilities to perform their responsibilities. All auditors have at least one relevant professional certification. Internal auditors are required by the Division's policies and procedures to enhance their knowledge, skills, and abilities by obtaining at least 40 hours of continuing professional education each year. The Division has hired contractors to assist in areas for which its expertise or resources have not been sufficient to satisfy the audit objectives.

Quality Assurance and Improvement Program
The Internal Audit Director has implemented a quality assurance and improvement program to help ensure that Internal Audit adds value and improves the agency's operations and to provide assurance that the Division complies with *Standards* and the IIA Code of Ethics. The quality assurance program includes items such as auditor performance evaluations, quality review of each assurance project, auditee surveys, performance measures, self-assessments, and periodic external peer reviews. The external reviews are communicated to the Board and made available to other oversight bodies.

Opportunity for Improvement:

2. Results of all internal quality assurance activities are not reported annually to the board and senior management as required by auditing standards. Quality assurance activities are being conducted, areas for improvement noted, and action taken. We recommend that a summary of these activities and the results be reported.

Director's Response:

2. Agree. Quality assurance activity results will be reported to the Board beginning December 2017 when the Internal Audit Division reports on its fiscal year performance.

Managing the Internal Audit Activity
The Internal Audit Director conducts an annual risk assessment that forms the basis for the Annual Audit Plan, which is approved by the Audit Committee. Each internal audit report addresses risk and control issues within the agency. The Director has developed policies and procedures to guide the internal audit activity. The Director reports the Division's performance relative to the annual plan in an annual report submitted to the agency's Executive Director and Audit Committee Chair, and in an Annual Report on Internal Audit submitted to the Governor's Office and the State Auditor.

Nature of Work
Internal Audit evaluates risks related to financial and operating information as well as the effectiveness and efficiency of operations, safeguarding of assets, and compliance with laws and regulations. The Division also evaluates the extent to which operating and program objectives have been achieved.

To comply with the 2002 revision to the IIA *Standards* that requires Internal Audit to contribute to the organization's risk management and governance processes, the Division provides information and assistance to Executive Management and the Board about how the accomplishment of goals is monitored and how accountability is ensured.

Engagement Planning
During planning, internal auditors consider the objectives of the activity being reviewed and the related risks and controls. Resources needed for each audit are adequately considered during

planning. Risk assessments are used to develop the objectives of each audit. An audit program are documented and approved for each audit. The scope of audits is adequately planned and documented in planning documents and audit reports.

Performing the Engagement
Internal auditors evaluate and document sufficient, reliable, and relevant information to achieve their audit objectives. Results and conclusions are based on analysis. Division policies and procedures contain guidance on performing the engagements.

Audits are supervised by the Internal Audit Director. The Lead Auditor for each project monitors the progress of the individual audits. The Internal Audit Director attends planning meetings, approves all control documents, and reviews working papers to ensure sufficiency of evidence and compliance with *Standards*.

Opportunity for Improvement:

3. Auditing standards require engagements to be properly supervised to ensure objectives are achieved, quality is assured, and staff is developed. While this is certainly the case at ERS, we note that in larger organizations, audits are often performed in teams where more experienced auditors review the work of others, mentor newer staff, and provide specialized expertise. At ERS, the Internal Audit Division is small (4 auditors), so there is less opportunity for supervision, mentoring, and specialized knowledge. We recommend:
    a. Exploring opportunities for working in teams so that staff can serve as a resource for each other, cross train, and develop supervisory skills
    b. Leveraging legal, information security, investment or other specialists inside and outside the organization as subject matter experts
    c. Considering whether an IT auditor would be beneficial in the future to support the IT and data analysis needs of each audit engagement
    d. Reviewing internal requirements for evidencing completion and review of working papers

Director's Response:

3. Agree. The Internal Audit Director will continue to explore opportunities for continued professional growth of staff including those related to supervision. Internal Audit was provided an additional FTE in FY2017 that should provide greater opportunity for staff to work in teams. The Internal Audit Division continuously evaluates its processes including audit documentation. Based on Peer Review results will evaluate the level of documentation maintained to ensure both an effective and efficient process is in place. Finally, the Director will continue to evaluate the need for internal IT capabilities. Currently co-source resources are utilized when IT subject matters are required. As the Internal Audit Division progresses having a subject matter expert specifically knowledgeable of ERS' information systems may be necessary.

Communicating Results
Audit results are communicated in a timely manner. Potential findings are communicated throughout the audits, which provide management the opportunity to provide additional information and/or to start taking corrective action. Audit results are presented to management before they are finalized in a report, which helps ensure there is agreement about the areas for improvement and the recommended solutions.

Audit reports contain the audit objectives, results, conclusions, recommendations, and management's responses and action plans. The results of our surveys and interviews with management indicated that internal audit reports are accurate, objective, clear, concise, and complete. The Internal Audit Director distributes internal audit reports to the Board, to Executive Management, and to management of the activity being audited.

Monitoring Progress
The agency has a system for monitoring the disposition of audit issues. The status of management's progress in implementing recommendations is reported semi-annually. Additionally, the Division performs follow up audits as deemed necessary through the annual planning process.

Resolution of Senior Management's Acceptance of Risks
During the quality assurance review, no instances were identified of management accepting an inappropriate level of risk that would require the Internal Audit Director to notify the Board.

Leading Practices

The Internal Audit Division is dedicated to continuous improvement. During the quality assurance review, we observed a number of practices that demonstrate outstanding commitment and professionalism. These leading practices include the following:

- The independence and authority of the audit function is optimized. The Internal Audit Director's performance and salary are reviewed annually by the Audit Committee. Auditors report directly to the Audit Committee and have direct access to the Audit Committee chair. Auditors assess and document independence annually and for each project.
- The Internal Audit Director advises and influences top level management through regular meetings, discussions about audit results, and input into the annual audit plan.
- Resources are available to facilitate expertise and knowledge through co-sourced audits and increased training funds.
- The audit team is comprised of 4 dedicated professionals with a variety of audit and non-audit experience in the public and private sectors. An additional resources has been approved.
- Quality work products are ensured through standardized processes, tools, and templates and review by the Internal Audit Director and quality control staff. Auditing standards criteria are included in the audit workpapers.
- Reports are clear, concise, easy to read, and supported by the audit workpapers.

Craig Hester, Chair of the Board

Brian Ragland, Chair of the Audit Committee

Porter Wilson, Executive Director

Tony Chavez, Director of Internal Audit

INTERNAL AUDIT EXTERNAL QUALITY ASSURANCE REVIEW

NOVEMBER 2016

ERS Internal Audit Division

Business Objectives

Obtain External Quality Assessment Review (QAR) to determine whether the Internal Audit (IA) function is in compliance with professional auditing standards, Texas Internal Auditing Act, and auditor codes of ethics.

Inherent Risks Without Controls

- Audits may not address significant organizational risks
- Audit processes may be inefficient and ineffective
- Assurance could be unreliable without effective quality control

Internal Audit Controls

- Internal Audit charter, ERS organizational chart, Audit Committee materials
- Job descriptions, resumes, training records, evaluations
- Work papers, work programs, reports, quality control processes
- Annual risk assessment, audit plan
- Operating budget, budgeted hours, IA policies and procedures

QAR Team Methodology

- Interviewed board members, executives, and IA staff; surveyed management
- Obtained and evaluated controls documents
- Evaluated audit activities for compliance with auditing standards

Best Practices

- Independence, power, and authority of the audit function are maximized.
- IA Director advises and influences top level management
- Resources are available to facilitate expertise and knowledge
- IA staff are experienced, dedicated professionals
- Quality work products and reports are ensured through quality assurance program

Results and Recommended Actions

In compliance with auditing standards. Recommendations in three areas:

- Formal assessments of threats to independence and respective safeguards
- Formal reporting on quality assurance activities
- Increased opportunities for supervision, mentoring, and specialized knowledge
  - Working in teams
  - Leveraging subject matter experts (internal and external)
  - Consideration of an IT auditor
  - Review of internal requirements for audit signoff

Internal Audit Responses

Agree with recommendations:

- Formal assessments of threats will be reported annually in August
- Review of quality assurance activities will be reported annually in December
- Exploration of additional opportunities for supervision, mentoring, and specialized knowledge are ongoing. An extra FTE will facilitate teamwork. Consideration of an additional IT resource and leveraging internal resources will be given over time and is currently supplemented with co-sourced projects. Working paper documentation is regularly evaluated to ensure effective and efficient process in place.

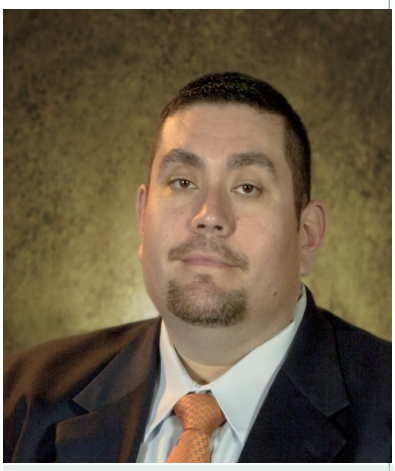
ERS

EMPLOYEES RETIREMENT SYSTEM OF TEXAS

ERS INTERNAL AUDIT DIVISON

Internal Audit Performance Measures for Fiscal Year 2016

NOVEMBER 14, 2016



FROM THE DIRECTOR

Overall fiscal year (FY) 2016 was another successful year for the Internal Audit Division with continued improvement in enhancing professional practices. Our External Peer Review results illustrate the significant progress achieved in this area with Internal Audit receiving the highest possible rating. The Division continues to expand the use of data analytics allowing for greater audit coverage and measurement of impact critical to ERS' strategic objectives.

In FY 2017 the Division will emphasize improvements in the strategic direction of professional development and performance management. Initiatives include staff training focus on ERS' core business functions and activities to seek and obtain greater input over key program risks and objectives. Select FY 2017 performance measures were updated to reflect these initiatives. Internal Audit is poised to continue driving positive change and improvement at ERS.

Sincerely

Anthony Chavez, CIA, CGAP, CRMA
Director, Internal Audit Division

Why Measure Performance ?

- Distinguish what appears to be happening from what is actually happening
- Establish a baseline
- Make an informed decision based on solid evidence
- Monitor progress to ensure improvements are sustained over time
- Identify areas of improvement
- Recognize improved performance

STRATEGIC DIRECTIONS

1. Enhance Professional **Practices**
2. Enhance **Performance** Management and Accountability
3. Grow **People** Management

"Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it." *H. James Harrington*

FISCAL YEAR PERFORMANCE MEASURES RESULTS

Strategic Direction	Measure	Target Goal	FY2016	FY2015
Performance	Percent of Audit Plan Completed	90%	87%	82%
Performance & Practice	Customer Service Levels	80%	88%	93%
Performance	Audit Customer Utilization Rate	15%	6%	12%
Performance & Practice	Number of Days in the Reporting Process	20 Business Days	28 days	24 days
People	Percent of Audit Staff Meeting Required CPE	100%	100%	100%
Performance	Percent of Audit Engagement Milestones Met	5 Business Days	43%	44%
Performance	Percent of Time Spent on Added Value Services	75%	75%	80%
Performance & Practice	Percent of Recommendations Accepted by Management	85%	97%	88%

SATISFACTORY **NEEDS IMPROVEMENT**

"Measures or benchmarks should provide a reasonable balance between difficulty of achievement and unrealistic performance measures." *Committee of Sponsoring Organizations (COSO)*

The IA-CM was designed to implement and institutionalize effective internal auditing in the public sector. The IA-CM provides a road Map for continuous improvement.

INTERNAL AUDIT CAPABILITY MODEL MATRIX

	Services and Role of IA	People Management	Professional Practices	Performance Management and Accountability	Organizational Relationships and Culture	Governance Structures
Level 5 – Optimizing (IA learning from inside/outside the org for continuous improvement	• IA recognized as key change agent	• Leadership Involvement with professional bodies • Workforce projection	• Continuous improvement in professional practices • Strategic IA planning	• Public reporting of IA effectiveness	• Effective and ongoing relationships	• Independence, power, and authority of IA activity
Level 4 – Managed (IA integrates information from across the organization to improve governance & risk management)	• Overall assurance on governance, risk and control	• IA contributes to management development • IA actively supports professional bodies • Workforce planning	• Audit strategy leverages Organization's management of risk	• Integration of qualitative and quantitative performance measures	• CAE advises and influences top-level management	• Independent oversight of the IA activity • CAE reports to top-level authority
Level 3 – Integrated (IA Management & professional practices uniformly applied)	• Advisory services • Performance/ value for money audits	• Team building and competency • Professionally qualified staff • Workforce coordination	• Quality management framework • Risk-based audit plans	• Performance measures cost information • IA management reports	• Coordination with other review groups • Integral component of management team	• Management oversight of the IA activity • Funding mechanisms
Level 2 – Infrastructure (sustainable, repeatable practices and procedures)	• Compliance auditing	• Individual professional development • Skilled people identified and recruited	• Professional practices and processes framework • Audit plan based on management/ stakeholder priorities	• IA operating budget • IA business plan	• Managing within the IA activity	• Full access to the Organization's information, assets and people • Reporting relationships established
Level 1 – Initial	Ad hoc and unstructured; isolated single audits or reviews of documents and transactions for accuracy and compliance; outputs dependent upon the skills of specific individuals holding the position; no specific professional practices established other than those provided by professional associations; funding approved by management, as needed; absence of infrastructure; auditors likely part of a larger organizational unit; no established capabilities; therefore, no specific key process areas. No sustainable, repeatable capabilities.					

Future Goals — State from 2012 until December 2014 — Current State January 2015 to August 2016

FISCAL YEAR 2016 HIGHLIGHTS

- Internal Audit is actively supporting professional organizations assisting with staff development and networking
- Internal Auditors act as facilitators for change by identifying key issues in audits performed
- Analysis of workforce requirements identified the need for an additional FTE
- Reassessed and revised the information systems risk assessment process to better reflect and assess emerging and evolving information technology risks
- Internal Audit staff obtained two professional certifications related to internal auditing and investments

FISCAL YEAR 2017 PERFORMANCE MEASURES

Strategic Direction	Measure	Target Goal
Performance	Percent of Audit Plan Completed	90%
Performance & Practice	Customer Service Levels	80%
Performance & Practice	Number of Days From End of Fieldwork to Draft Report is Sent to Executive Director*	25 business days
People	Percent of Audit Staff Meeting Required CPE	100%
Performance	Percent of Time Spent on Added Value Services	75%
Performance & Practice	Percent of Recommendations Accepted by Management	85%
People	Percent of Audit Staff attending 40% of training in core business to increase business acumen*	100%

* = New or Revised Performance Measures

1. ENHANCE PROFESSIONAL PRACTICES

Strategies	Measures	FY 2017 Goals
• Perform work in accordance with standards • Maintain commitment to core principles • Increase and enhance communication to stakeholders	• Customer Service Levels • Number of Days from End of Fieldwork to Draft Report sent to Executive Director • Percent of Recommendations Accepted by Management	• Continue refinement of the audit templates to enhance productivity and efficiency • Leverage data analytics and technology to deliver meaningful insight that empowers informed decision making • Continue to update IA intranet homepage to communicate attributes, roles, and responsibilities of the IA function to audit customers • Upgrade audit management software used to manage and document audit work • Review Internal Audit Charter for necessary revisions

2. ENHANCE PERFORMANCE MANAGEMENT AND ACCOUNTABILITY

Strategies	Measures	FY 2017 Goals
• Ensure focus on areas of impact and strategy • Enhance the efficiency and productivity of the Internal Audit function • Align audit activities with ERS' mission and strategic direction	• Percent of Audit Plan completed • Customer Service Levels • Number of Days from End of Fieldwork to Draft Report sent to Executive Management • Percent of Time Spent on Added-Value Services • Percent of Recommendations Accepted by Management	• Seek and incorporate greater input from stakeholders regarding program risks and objectives • Continue to evaluate audit plan risk criteria to ensure alignment with current agency risk profile • Evaluate audit time utilization to ensure audit activities align with ERS strategic direction • Continue to assess the level of internal audit resources to ensure alignment with mission and Board risk appetite. • Evaluate use of internal and /or external audit resources for optimization of expertise

Optimizing Process Improvement
While Meeting Professional Audit Standards

3. GROW PEOPLE MANAGEMENT

Strategies	Measures	FY 2017 Goals
• Identify necessary competencies and skills • Maintain and enhance the knowledge, skills, and other competencies needed to perform duties • Participate in Professional and Peer Organizations	• Percent of Audit Staff meeting CPE requirements • Percent of Audit Staff attending 40% of training in core business to increase business acumen	• Focus training efforts on key business operations such as investments and information technology • Continue to evaluate staff performance plans to ensure essential tasks and standards continue are aligned with IA's strategic direction • Encourage staff to obtain additional professional certifications • Perform select engagements as a team to provide for additional op-

ERS

EMPLOYEES RETIREMENT SYSTEM OF TEXAS

Internal Audit Annual Report
Fiscal Year 2016

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MISSION:
Internal Audit provides independent and objective assurance on the effectiveness of controls and operations to meet ERS' strategic direction.

PRINCIPLES:

Integrity — work performed with honesty, diligence, and responsibility

Objectivity – impartial and unbiased attitude in audit work performed

Confidentiality - value and ownership of information respected and maintained

Competency - work performed with proficiency and due professional care

VISION:

- Relevant and beneficial audit results
- Sustainable and repeatable audit practices and procedures
- Meaningful Internal Audit indicators and measures
- Staff professional development and growth

I. Compliance Texas Government Code, Section 2102.015: Posting the Internal Audit Plan, Internal Audit Annual Report and Other Audit Information on the Internet Website

House Bill 16 (83rd Legislature, Regular Session), signed by Governor Perry on June 14, 2013, amended the Internal Auditing Act to require state agencies and institutions of higher education, as defined in the bill, to post agency internal audit plans, internal audit annual reports, and any weaknesses or concerns resulting from the audit plan or annual report on the agencies' Internet Web site within 30 days after the audit plan and annual report are approved by the agencies' governing board or chief executive.

The Internal Audit Division meets the requirements by posting the approved documents at the following link: http://www.ers.state.tx.us/About_ERS/Reports/Overview/

A detailed summary of weaknesses, deficiencies, wrongdoings, or others concerns raised by the audit plan or annual report and a summary of actions taken by ERS to address concerns, if any, that are raised by the audit plan or annual report is included in part II of this document.

II. Internal Audit Plan for Fiscal Year 2016

Report Number	Title	Date	Status
2015-02	Procurement	12-2015	Report Issued
2015-04	BI Data Warehouse	02-2016	Report Issued
2016-01	Incentive Compensation Plan	11-2015	Report Issued
2016-02	GBP Procurement Follow-Up	04-2016	Report Issued
2016-05	Network Security (Cybersecurity)	07-2016	Report Issued
2016-06	Disability Retirements	07-2016	Report Issued
2016-IC-AUP-01	Investment Compliance AUP July – September 2015	11-2015	Report Issued
2016-IC-AUP-02	Investment Compliance AUP October – December 2015	01-2016	Report Issued
2016-IC-AUP-03	Investment Compliance AUP January – March 2016	04-2016	Report Issued
2016-IC-AUP-04	Investment Compliance AUP April – June 2016	07-2016	Report Issued
2016-02 Follow-Up	Status of Audit Recommendations	01-2016	Report Issued
2016-08 Follow-Up	Status of Audit Recommendations	07-2016	Report Issued

Deviations from the approved FY2016 Audit Plan

One project was removed from FY2016 Audit Plan and another project was added.

Report Number	Title	Status
	Flexible Spending Accounts	Removed from Audit Plan
2016-04	Prescription Drug Program	Added to Audit Plan

Two projects were carried forward to the FY2017 Audit Plan.

Report Number	Title	Status
2016-03	Hedge Funds	Carried Forward to FY2017 Audit Plan
2016-04	Prescription Drug Program	Carried Forward to FY2017 Audit Plan

Detailed summary of weaknesses, deficiencies, wrongdoings, or other concerns raised by the Audit Plan or Annual Internal Audit Report.

Twice a year, Internal Audit reviews the management action plans identified within each audit report to ensure appropriate mitigating activity is being implemented or that executive management has accepted the risk. The results of the follow-up procedures are reported to the Board of Trustees and Executive Management in December and February of each year.

1) In FY2016, ERS Internal Audit Division completed six (6) audit projects with ten (10) observations identified.
    - 08 Control Design[1]
    - 02 Operating Effectiveness[2]

    Most Management Action Plans for the above audits have FY2017 completion target dates.

2) ERS Internal Audit Division completed two (2) Follow-Up Audits reviewing Management Action Plan (MAPs) to determine if management addressed the risk identified. There were 10 total findings/observations from prior year's audit engagements reviewed.
    - 10 Control Design
        - 07 of 10 were Fully Implemented
        - 03 of 10 were Partially Implemented

[1] Choose Control Design when there is an error in the way the process is set-up or nothing is in place.
[2] Choose Operating Effectiveness when there is a process in place but the process is not working efficiently or effectively.

III. Consulting Services and Nonaudit Services Completed

The *International Standards for the Professional Practice of Internal Auditing* define consulting services as advisory in nature and at the specific request of an engagement client. The nature and scope of consulting engagements are subject to agreement with the engagement client.

Service Organization Control (SOC) reports

In fiscal year 2016, Internal Audit reviewed Service Organization Control (SOC) reports for compliance with Statement on Standards for Attestation Engagements No. 16 – *Reporting on Controls at Service Organizations.*

Specifically we performed the agreed upon procedures to assist management in its review of the service providers SOC report. Internal Audit did not perform review procedures to determine if the service organization control objectives and the related control activities are relevant to ERS nor did we perform procedures to identify any control gaps that may affect ERS' business objectives. Information provided was intended solely for the use of ERS management, and was not intended to be and should not be used by anyone other than the specified party.

Deliverable	Title	Date	Objective
Memorandum	Minnesota Life Insurance Company	10/26/2015	Reviewed the vendor SOC report for compliance with Statement on Standards for Attestation Engagements No. 16.
Memorandum	Empower Retirement, Defined Contribution Plan Record Keeping System	01/06/2016	Reviewed the vendor SOC report for compliance with Statement on Standards for Attestation Engagements No. 16.
Memorandum	CareMark RX, Pharmacy Benefit Management System	02/01/2016	Reviewed the vendor SOC report for compliance with Statement on Standards for Attestation Engagements No. 16.
Memorandum	Wells Fargo Institutional Retirement & Trust	07/07/2016	Reviewed the vendor SOC report for compliance with Statement on Standards for Attestation Engagements No. 16.
Memorandum	United HealthCare Report on Claims Administration Processing	8/24/2016	Reviewed the vendor SOC report for compliance with Statement on Standards for Attestation Engagements No. 16.

Allegations of Fraud, Waste and Abuse

In fiscal year 2016, Internal Audit continued to assist in compiling, tracking, and coordinating with the Chief Compliance Officer to determine the proper delegation and disposition of the final results of internal and external allegations of wrongdoing. Trends identified are reported to the Board of Trustees annually. In addition, three fraud investigations were completed but no wrong doing was identified.

Informal Consulting

Internal Audit also provided input and guidance as a subject matter expert related to risk and control self-assessments. This included methodology for measuring inherent risk to assist divisions in identifying those areas of most importance. Internal Audit did not develop or implement any specific control activities nor assume any management responsibility. No formal deliverable was prepared.

IV. External Quality Assurance Review (Peer Review)

REPORT ON THE EXTERNAL QUALITY ASSURANCE REVIEW OF THE EMPLOYEES RETIRMENT SYSTEM OF TEXAS

INTERNAL AUDIT DIVISION

October 31, 2013

PERFORMED BY

AMY BARRETT
CHIEF AUDIT EXECUTIVE
TEACHER RETIREMENT SYSTEM OF TEXAS

TOM MCGAHA
SENIOR INTERNAL AUDITOR
TEXAS DEPARTMENT OF INSURANCE

KENT HEATH
INTERNAL AUDITOR
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

PERFORMED IN ACCORDANCE WITH THE
STATE AGENCY INTERNAL AUDIT FORUM
PEER REVIEW POLICIES AND PROCEDURES

OVERALL OPINION

Based on the information received and evaluated during this external quality assurance review, it is our opinion that the Employees Retirement System of Texas (ERS) Internal Audit Division receives a rating of "pass with deficiencies" and is in material compliance with the Institute of Internal Auditors (IIA) *International Professional Practices Framework* and Code of Ethics, the United States Government Accountability Office (GAO) *Government Auditing Standards*, and the Texas Internal Audit Act (*Texas Government Code*, Chapter 2102) with exceptions identified in the report. This opinion, which is the middle of the three possible ratings, means that policies, procedures, and practices are in place to implement the standards and requirements necessary for ensuring the independence, objectivity, and proficiency of the internal audit function, with the exception of the deficiencies noted.

We found that the Internal Audit Division is independent, objective, and able to render impartial and unbiased judgments on the audit work performed. The staff members are qualified, proficient, and knowledgeable in the areas they audit. Individual audit projects are planned using risk assessment techniques; audit conclusions are supported in the working papers; and findings and recommendations are communicated clearly and concisely.

The Internal Audit Division is well managed internally. In addition, the Division has effective relationships with the ERS Board of Trustees (Board) and is well respected and supported by management. Interviews conducted during the quality assurance review indicate that management considers Internal Audit a useful part of the overall agency operations and finds that the audit process and report recommendations add value and help improve the agency's operations.

ACKNOWLEDGEMENTS

We appreciate the courtesy and cooperation extended to us by the Internal Auditor, Internal Audit staff, Board Members, the Executive Director, Chief Operating Officer, and the senior managers who participated in the interview process. The feedback from the interviews provided valuable information regarding the operations of the Internal Audit Division and its relationship with management.

Amy Barrett 10/31/13
Amy Barrett — *Date*
Chief Audit Executive
Teacher Retirement System of Texas
SAIAF Peer Review Team Leader

Tom McGaha 10/31/13
Tom McGaha — *Date*
Senior Internal Auditor
Texas Department of Insurance
SAIAF Peer Review Team Member

Kent B. Heath 10/31/13
Kent B. Heath — *Date*
Internal Auditor
Texas Commission on Environmental Quality
SAIAF Peer Review Team Member

V. Internal Audit Plan for Fiscal Year 2017

Introduction

The Texas Internal Auditing Act (Texas Government Code) requires that a risk-based annual audit plan be developed and approved by the Board of Trustees. The Plan is designed to provide coverage of key risks, given the existing staff and approved budget. Key risks were determined based on a systemic approach incorporating management input, Internal Audit analysis, and ERS' strategic objectives.

Continuous evaluation of the Internal Audit Plan, based on risks identified, timing of ERS' initiatives, and staff availability may result in modifications to the Internal Audit Plan during the year. Significant modifications to the Internal Audit Plan will be coordinated with the Executive Director and submitted to the Audit Committee Chair for review and approval.

Audit Plan Approach

The annual internal audit plan is developed based on ERS' audit universe, stakeholder input, and an assessment of risk and exposures affecting ERS. Throughout the year Internal Audit advances its understanding of ERS strategic objectives and initiatives through attendance at strategic planning meetings, and division presentations/training. Auditors also gain an understanding of industry trends and current environmental risks through discussions with industry personnel, review of trade publications, and attending relevant external training. On a periodic basis the audit universe and associated risk measurement tools are updated to reflect current strategies and the direction of the agency.

ERS' audit universe is divided into two separate and distinct groupings to better assess and measure risks associated with core business objectives. The first group, Member Services (Retirement, Group Benefits, Operations and Information Resources), relates to ERS core business objectives of providing retirement and benefit programs to state employees, retirees, and their dependents. The second group, Investments, core business relates to the ERS goal of earning investment returns on a long-term basis to support ERS member services.

For the FY 2017 the Audit Universe was significantly revised including the development of specific risk criteria for Information Systems and incorporation of a framework to better evaluate cybersecurity risk and objectives. The framework is divided into five core functions with each containing distinct security objectives.

For each auditable unit (program process or investment strategy), Internal Audit utilized risk criteria tailored for each audit universe, auditor professional judgement and feedback from Stakeholders to measure the inherent risk by impact and likelihood that it would affect ERS goals or objectives. This allowed Internal Audit to identify those areas that were high risk and impact to ERS' strategic directions to be carried forward to the fiscal year 2017 audit plan. In addition key operational functions that were assessed lower risk ratings were also carried forward to the fiscal year 2017 audit plan because periodic review was deemed necessary and appropriate.

Internal Audit Plan

The Board of Trustees approved the Internal Audit Plan for Fiscal Year 2017 on August 16, 2016. The Internal Audit Plan consists of twelve risk-based, value-adding activities for the fiscal year. The audit activities (including FY2016 Audits carried over) consist of three (3) types of activities and coverage:

Audits

- Nature and scope of engagement determined by Internal Audit
- Highest level of assurance
- Deliverable: Report for public distribution

Agreed Upon Procedures

- Specific procedures agreed to between management and Internal Audit to perform and report on the results
- Lowest level of assurance
- Deliverable: Report/memo for public distribution

Consulting (Advisory)

- Nature and scope of engagement subject to agreement with audit customer
- No assurance provided
- Deliverable: Report or memo with limited distribution

The Internal Audit Division will provide the results of audit activities to the Audit Committee and Board of Trustees at the request of the Audit Committee Chair.

Approved Audit Plan FY2017

Title	Type	Budgeted Hours
Ethics Program	Audit	350
Procurement Cards	Audit	350
Contract Management – HealthSelect*	Audit	750
Revenue Processing – State Agency Contributions	Audit	500
Standard Retirements	Audit	750
Privacy Incident Response	Audit	750
Incentive Compensation	Audit	200
Investment Compliance Review	Consulting (Advisory)	750
Investment Governance	Consulting (Advisory)	500
Quarterly Investment Compliance Procedures	Agreed Upon Procedures	500
2016 Financial Audit Opinion	Audit	80
Pension Actuary Review	Audit	40

*Contract management

Contingency List

A contingency list of two (2) activities is also included in the internal audit plan. These risks were ranked as “high” but were not included in the fiscal year 2016 Internal Audit Plan. This provides for additional coverage if the above activities are completed prior to the conclusion of the fiscal year.

Title	Type
HealthSelect Denial Process	Audit
Global Credit High Yield	Audit

VI. External Audit Services Procured in Fiscal Year 2016

Audit Engagement	Vendor
The Audit of ERS' Fiscal Year 2015 Financial Statements	Texas State Auditor's Office
Schedule of Employer Allocation and the Collective Pension Amounts including: 1) Independent Auditor's Report and 2) Report on Internal Control Over Financial Reporting and on Compliance and Other Matters.	Texas State Auditor's Office

VIII. Reporting Suspected Fraud and Abuse

ERS has a responsibility to state employees, retirees, and the public to maintain the highest ethical standards when conducting business. Individuals are encouraged to report in good faith any suspected fraud, waste, abuse, or ethics policy violation in connection with programs administered by ERS.

ERS complies with the requirements of Article IX, *Section 7.09, Fraud Reporting, General Appropriations Act* General Appropriations Act (83rd Legislature, Conference Committee Report) by:

- Enforcing the ERS Fraud policy to minimize the impact of potential or actual fraudulent acts at ERS by deterring such activity or detecting it as early as possible
- Alerting all ERS employees that there are reporting mechanisms that are easy, safe and secure using:
    - ERS Public website
    - ERS Internal Focal Point Website (Intranet)
    - Direct contact with Internal Audit
    - State Auditor's Office Hotline
- Alerting the public that there are reporting mechanisms that are easy, safe, and secure using:
    - ERS Public website at https://www.ers.state.tx.us/three_column_template.aspx?menuid=2147483675&pageid=2147483685
    - Direct contact with the Director, Internal Audit Division or Chief Compliance and Ethics Officer
    - State Auditor's Office Fraud Hotline telephone number is listed on the ERS Public Website at https://www.ers.state.tx.us/three_column_template.aspx?menuid=2147483675&pageid=2147483685

ERS complies with the requirements of Texas Government Code, Section 321.022 *Coordination of Investigations* by submitting *Reasonable Cause to Believe* report(s) to the State Auditor's Office if applicable.

The Director, Internal Audit Division coordinates the *SAO Hotline Complaints* with his Texas State Auditor's Office designated contact.

PUBLIC AGENDA ITEM - # 12

12. Adjournment of the ERS Board of Trustees Audit Committee

December 2, 2016

Following adjournment of the ERS Audit Committee, the Board of Trustees will take up the remaining agenda items

PUBLIC AGENDA ITEM - # 13

13. Review and Approval of the Minutes to the August 16, 2016 Meeting of the Board of Trustees

December 2, 2016

BACKGROUND:

The minutes to the Employees Retirement System of Texas Board of Trustees meeting held on August 16, 2016 are included with this agenda item as Exhibit A. The minutes are submitted to the Board for review and approval.

PROPOSED MOTION:

Staff recommends the following motion to the Board of Trustees:

> I move that the Board of Trustees of the Employees Retirement System of Texas approve the minutes to the meeting held on August 16, 2016.

ATTACHMENT – 1
Exhibit A – Proposed Minutes to the Board of Trustees Meeting of August 16, 2016

Meeting of the Board of Trustees

August 16, 2016

ERS
EMPLOYEES RETIREMENT SYSTEM OF TEXAS

Presented for Review and Approval

December 2, 2016

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August 16, 2016

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BOARD OF TRUSTEES MEETING
EMPLOYEES RETIREMENT SYSTEM OF TEXAS

August 16, 2016 – 12:18 p.m.
ERS Building – Board Room
200 E. 18th Street, Austin, Texas 78701

TRUSTEES PRESENT
I. Craig Hester, Chair
Doug Danzeiser, Vice-Chair
Ilesa Daniels, Member
Cydney Donnell, Member
Brian Ragland, Member

TRUSTEES NOT PRESENT
Jeanie Wyatt, Member (excused by the Board)

ERS STAFF PRESENT
Porter Wilson, Executive Director
Catherine Terrell, Deputy Executive Director
Paula A. Jones, Deputy Executive Director and General Counsel
Shack Nail, Special Projects and Policy Advisor
Tony Chavez, Internal Auditor
Bernie Hajovsky, Director of Enterprise Planning Office
Jordan Hajovsky, Co-Director of Operations Support
Robin Hardaway, Director of Customer Benefits
Robert Kukla, Director of Benefit Contracts
Wendy McAdams, Co-Director of Operations Support
Machelle Pharr, Chief Financial Officer
DeeDee Sterns, Director of Human Resources
Gabrielle Stokes, Director of the Office of Procurement & Contract Oversight
Kathryn Tesar, Director of Benefits Communications
Tom Tull, Chief Investments Officer
Chuck Turner, Director of Information Systems
Nora Alvarado, Benefit Contracts
Brannon Andrews, Legal Services
Adriana Ballard, Investments
Georgina Bouton, Benefit Contracts
Amanda Burleigh, Legal Services
Kelley Davenport, Executive Office
Christi Davis, Customer Benefits
D'Ann DeLeon, Benefit Contracts
Brian Dowdy, Finance
Peter Ehret, Investments
Leah Erard, Governmental Affairs
Liz Geise, Benefits Communications
Beth Gilbert, Internal Audit
Wesley Gipson, Investments
Gunther Goetz, Legal Services
Megan Hunter, Benefit Contracts
Jennifer Jones, Governmental Affairs
Sharmila Kassam, Deputy Chief Investment Officer
Nick Maffeo, Investments

Betty Martin, Investments
Pamela Maas, Benefit Contracts
Roger Nooner, Benefits Communications
Davis Peacock, Investments
Jonathan Puckett, Internal Audit
Tanna Ridgway, Investments
Lauren Russell, Benefit Contracts
Cheryl Scott Ryan, Legal Services
Randi Schultz, Office of Procurement & Contract Oversight
Robert Sessa, Investments
Bernely Tharp, Benefit Contracts
Tommy Williams, Information Systems
Keith Yawn, Enterprise Planning Office

ALSO PRESENT
Nick Arnold, Humana
Keith Barnes, Blue Cross Blue Shield of Texas
Chason Beggerow, Altius Associates
Tiffany Calderon, Humana
Amy Chamberlain, Texas Public Employees Association
Andrew Clark, Office of the Speaker of the Texas House of Representatives
Darryl Collier, Empower Retirement
Chris Cook, AAG/Empower Retirement
Philip Dial, Rudd and Wisdom
Joseph Halbert, Senator Schwertner's Office
Bill Hamilton, Retired State Employees Association
Meg Hare, Accenture Health & Public Service
Kris Hefner, Caremark
Yves-Laurent Khoury, Blue Cross Blue Shield of Texas
Kim McLeod, UnitedHealthcare
Brittany McCollum, Caremark
Ashley Odom, UnitedHealthcare
Peter Ossian, Empower Retirement
Toni Parsley, Texas Commission on Environmental Quality
Laura Pinkard, Humana
Gabriel Puente, Strategic Partnerships Inc.
Bill Thornton, Empower Retirement
Brad Untiedt, Empower Retirement
James Walsh, Albourne America
Karen K. Wilson, Northrop Grumman

Craig Hester, Chairman of the Board of Trustees of the Employees Retirement System of Texas (ERS), noting a quorum was present, called the meeting to order and read the following statement:

"A public notice of the Board of Trustees meeting containing all items on the proposed agenda was filed with the Office of the Secretary of State at 10:56 a.m. on Thursday, August 4, 2016 as required by Chapter 551, Texas Government Code, referred to as "The Open Meetings Law."

The Board of Trustees then convened as a committee of the whole at 12:18 p.m. to consider Board of Trustee meeting agenda items.

XI. Review and Approval of the Minutes to the May 17, 2016 Meeting of the Board of Trustees

Board of Trustee Chair, Mr. Craig Hester opened the floor for a motion on the approval of the minutes to the Board of Trustees Meeting held on May 17, 2016.

MOTION made by Mr. Doug Danzeiser, seconded by Ms. Ilesa Daniels and carried unanimously by the present members of the Board of Trustees of the Employees Retirement System of Texas to approve the minutes to the meeting held on May 17, 2016.

XII. Review, Discussion and Consideration of Reappointment of ERS Investment Advisory Committee Member

Tom Tull, Chief Investment Officer, recommended the Board reappoint Mr. Ken Mindell to the Investment Advisory Committee (IAC) for a new three-year term ending May 31, 2019. Biographical information is in Exhibit A. Mr. Hester and Porter Wilson, Executive Director, briefly discussed the makeup of the IAC and future direction. Mr. Hester opened the floor for a motion on the approval of the reappointment of Mr. Ken Mindell to the IAC.

MOTION made by Mr. Brian Ragland that the Board of Trustees of the Employees Retirement System of Texas reappoints Mr. Ken Mindell to the Investment Advisory Committee for a three-year term ending May 31, 2019. Mr. Ragland further moved that the Executive Director be authorized to execute and administer contracts in connection with the reappointment of Mr. Mindell. The motion was seconded by Ms. Cydney Donnell and carried unanimously by the present members of the Board of Trustees of the Employees Retirement System of Texas.

XIII. Review, Discussion and Consideration of the Rules of the Board of Trustees, Texas Administrative Code, Title 34, Part IV: Required Rule Review and Amendments to Chapter 81 (Insurance) and Amendment to Chapter 85 (Flexible Benefits)

Mr. Gunther Goetz, Office of the General Counsel, and Ms. Laurie Kuehner, Customer Benefits Division, presented proposed amendments to Texas Administrative Code, Title 34, Part IV, Chapter 81 (Insurance) and Chapter 85 (Flexible Benefits). ERS staff informed the Board that it performed a thorough review of Chapter 81, which covers the Texas Employees Group Benefits Program (GBP), including eligibility, enrollment, and cancellation of coverage and health plans. Amendments were proposed that included updating terminology, clarifying existing definitions and eliminating terms that are no longer necessary throughout the rule.

Staff discussed that proposed amendments clarify that a member's spouse must be formally married or in a common law marriage with a filed Declaration of Informal Marriage prior to the effective date of the dependent spouse's enrollment in the GBP. The amendment also created a narrow exception to the requirement to file the declaration based on clear and compelling evidence sufficient to ERS that the marriage existed prior to enrollment in the GBP. The definition regarding dependents was also proposed to be amended to specify the requirements for continuing health insurance eligibility for children ages 26 years and older who are mentally or physically incapacitated as authorized by Texas Insurance Code §1551.004(a)(3).

Staff discussed proposed amendments to §81.5 (Eligibility) which clarify that a former COBRA unmarried child would be eligible to enroll a newly acquired dependent child within 30 days of the child's

date of birth or placement for adoption. These particular GBP participants would otherwise be unable to add dependents to their coverage.

Additionally, staff explained that proposed changes also would amend the rules to comply with provisions of the Affordable Care Act (ACA) by decreasing the waiting period for coverage to the first day of the month following 60 days of employment, deleting references to a preexisting conditions limitation or exclusion, and provide that married dependents under age 26, who are otherwise eligible dependents, could continue to be enrolled as dependents and would not be required to apply for COBRA coverage until they reach age 26.

Staff explained that proposed amendments to §81.7 (Enrollment and Participation) include addressing payment of insurance required contributions and state contributions, and clarify that a Medicare-eligible surviving dependent, eligible for health coverage under the GBP, may be automatically enrolled in the Medicare Advantage Plan unless the surviving dependent opts out and enrolls in other coverage. The proposed amendments would also add requirements related to the new optional coverage for a vision plan and the new Consumer Directed HealthSelect℠ plan, offered through the GBP. The proposed amendments would also allow participants enrolled in an HMO whose contract is not renewed to enroll in another approved HMO for which they are eligible. Such participants may also enroll in HealthSelect of Texas or Consumer Directed HealthSelect, instead of another HMO. The proposed amendments also clarify that qualifying life events may permit a change in coverage for participants, including dropping or adding eligible dependents, if the requested change is consistent with the qualifying life event.

Staff discussed the proposed amendments to §81.9 (Grievance Procedure), including adding clarity regarding available grievance rights for participants whose claims are denied by administering firms or carriers in the GBP, and clarifying that participants with a denied claim in certain plans must request reconsideration from the carrier or administering firm prior to seeking grievance review by ERS.

Staff also discussed proposed non-substantive amendments and reorganization of provisions to all sections that were before the Board for consideration.

The notice of proposed amendments to Chapter 81 was published in the July 8, 2016 issue of the *Texas Register*, and ERS received one comment. The Coalition for Nurses in Advanced Practice (CNAP) requested that certified nurse-midwives be added as practitioners who could certify the date of birth for a newborn natural child for purposes of eligibility and enrollment in life and accidental death & dismemberment (AD&D) coverage. ERS staff agreed and recommended the change.

Staff also presented a proposed non-substantive amendment to Section 85.4 (Separate Plans) to update a numerical reference in subsection (c) regarding the Insurance Premium Conversion Plan described in Chapter 81 to conform with proposed amendments to Chapter 81. The notice of the proposed amendment for Chapter 85 was published in the July 8, 2016 issue of the *Texas Register*. ERS did not receive any comments.

Staff also reported that Texas law requires review of rules every four years, and staff reviewed Chapter 81 (Insurance) per §2001.039, Tex. Gov't Code. The notice of proposed rule review was published in the February 14, 2014 issue of the *Texas Register* as required by statute, and ERS did not receive any comments.

Mr. Hester asked about changes to the definition regarding dependents ages 26 years and older, and he also asked if the rule changes would cause any increase in costs to maintain benefits. Staff

explained that the rule changes were not expected to cause any increase in costs to maintain any of the benefits that ERS offers. Ms. Donnell inquired about the amendments regarding COBRA coverage. Staff explained that the amendment is consistent with current practice by allowing a one-time opportunity to add a natural or adopted child for 36 months of coverage within 30 days of the child's birth or placement for adoption.

The Board then took the following action:

MOTION made by Mr. Danzeiser, seconded by Ms. Donnell and carried unanimously by the members of the Board of Trustees of the Employees Retirement System of Texas that the Board take the following actions with regard to the Rules of the Board of Trustees, Texas Administrative Code, Title 34, Part IV, as presented in Exhibits A and B to the agenda item:

- Adopt the proposed amendments to Chapter 81, Insurance, as reflected in Exhibit A attached to the agenda item;
- Readopt Chapter 81, which includes the changes adopted by the Board as provided by Exhibit A to the agenda item, because the reasons for initially adopting the chapter continue to exist; and
- Adopt the proposed amendment to Chapter 85, concerning Flexible Benefits, as reflected in Exhibit B and the agenda item.

XIV. Review, Discussion and Consideration of the Texas Employees Group Benefits Program:

a. HealthSelect of Texas Financial Status Update as of June 30, 2016

b. Approval of Proposed Rates for Medicare Advantage Health Maintenance Organization Plan for Calendar Year 2017

c. Approval of Proposed Rates for HealthSelect Medicare Advantage for Calendar Year 2017

Texas Employees Group Benefits Program (GBP) health benefits include HealthSelect of Texas (HealthSelect); three fully insured health maintenance organizations (HMOs); HealthSelect Medicare Advantage, a Medicare Advantage preferred provider organization (MAPPO); KelseyCare Advantage, a Medicare Advantage HMO (MA HMO); and two prescription drug plans (PDPs). HealthSelect is a self-funded point of service health benefit plan offered under the GBP. About 82% of GBP health plan participants are enrolled in HealthSelect, which offers health benefits coverage throughout Texas and the United States.

a. HealthSelect of Texas℠ Financial Status Update as of June 30, 2016

Mr. Rob Kukla, Director of Benefit Contracts, explained that all GBP health plans' financial status is positive. During FY16, total revenue is estimated to be $3.382 billion and total GBP health plan expenditures are estimated at $3.349 billion. As of June 30, the plan is estimated to have a net gain of $33.6 million for the year. As a result of favorable experience and cost saving measures adopted by the plan, the GBP should finish the plan year with $474.1 million in the contingency fund.

The positive outcome of the contingency fund is credited to higher rebates and higher Medicare Part D subsidies. In addition to these increased projections, there have also been gains due to lower pharmacy cost trends than previously reported.

Cost containment strategies of the patient-centered medical homes (PCMHs) continue to be successful, resulting in a reduction in health care costs for the last five years of $49.2 million. Beginning in September 2016, ERS will add Texas Tech University and the Physicians Network Services in Lubbock, and will continue to negotiate adding a PCMH in the Amarillo area. ERS continues to work to expand its PCMH strategy. The Board asked about expansion in larger metro areas. Staff explained the current rationale, past experience and current success.

As far as the outlook for Fiscal Year 2017, the IRS will increase the maximum out-of-pocket limits for health plans. ACA fees are projected to increase costs by approximately $12.5 million in FY17.

Beginning September 1, 2016, Consumer Directed HealthSelect will become available for GBP participants not eligible for Medicare. This is a new choice for members, in addition to HealthSelect of Texas and the regional HMOs. The enrollment was only 343, much less than the anticipated 7,500. The Board and staff discussed the minimal financial impact on HealthSelect rates and the result of a legislative mandate. Another approved new plan was for vision care – a success, with 56,280 members enrolling (107,000 total, including dependents).

Mr. Blaise Duran, Benefit Contracts Manager of Underwriting, Data Analysis and Reporting, explained the health cost trend is expected to remain at about 8%. The fund balance is currently estimated to be $560.1 million at the end of FY17, after an estimated gain of $86 million for FY17. This gain is due to the new pharmacy benefits manager (PBM) contract with UnitedHealthcare, effective January 1, 2017. This contract is expected to save approximately $100 million over the last eight months of the fiscal year. ERS staff will continue to monitor the health benefit cost trend closely. Mr. Kukla added that the contingency fund (60 days) would need to be $687 million. All the health plans together – HealthSelect, the Medicare Advantage plans and the HMOs – are financially solid moving into the next biennium. The Board and staff discussed the contingency fund's importance to the sustainability and financial health of the GBP.

This agenda item was presented for informational and discussion purposes only.

b. Approval of Proposed Rates for Medicare Advantage Health Maintenance Organization Plan for Calendar Year 2017

Mr. Kukla, Director of Benefit Contracts, reviewed the Medicare Advantage Health Maintenance Organization (MA HMO). The MA HMO option has been available since September 1, 2011. The program provides medical benefits to certain retirees and their eligible dependents who are Medicare eligible for primary coverage under Medicare Part A and Part B. Benefits are designed to provide coverage that is at least as comprehensive as provided under HealthSelect of Texas. Participants can enroll in the plan; they may elect to opt back into their originating medical program at the next annual enrollment.

KelseyCare is the only MA HMO currently offered and provides coverage at 19 clinics in eight Houston-area counties. Participants must use providers in the network. Mr. Duran explained the MA HMO member contribution rates are based on the plan premium, HealthSelect Medicare Rx prescription drug coverage and the Health Insurance Provider (HIP) fee. Enrollment continues to steadily grow. Rates must conform to the state's appropriation rider stating ERS cannot charge more or pay more for a fully insured plan than the cost of coverage under the basic plan, HealthSelect of Texas. There are changes in federal payments and payment methodology. These payment policies include substantial changes to the MA payment system. The staff and consulting actuary projected the cost of prescription drug coverage under HealthSelect Medicare Rx, with decreases in costs. The decreases in medical rates, pharmacy costs and the suspension of the HIP fee result in a rate decrease proposal for CY17. The Board and staff discussed plan benefit comparisons with in-network and out-of-network costs.

There being no further questions or discussion, the Board took the following action.

MOTION (14b) made by Ms. Cydney Donnell, seconded by Mr. Brian Ragland and carried unanimously by the members of the Board of Trustees of the Employees Retirement System of Texas:
I move that the Board of Trustees of the Employees Retirement System of Texas approve contribution rates as presented in this agenda item for the following Medicare Advantage HMO for participation in the Texas Employees Group Benefits Program for Calendar Year 2017:

KS Plan Administrators, L.L.C., D/B/A KelseyCare Advantage MA HMO Plan to provide Medicare Advantage HMO medical-only coverage in the Houston application area which includes the counties indicated in Exhibit A of this agenda item.

c. Approval of Proposed Rates for HealthSelect Medicare Advantage for Calendar Year 2017

Mr. Kukla explained that retired GBP participants who are eligible for Medicare have been able to enroll in a statewide Medicare Advantage Preferred Provider Organization (MAPPO) option since January 1, 2012. The plan, known as HealthSelect Medicare Advantage (HealthSelect MA), provides medical benefits to retirees and their eligible dependents. All participants must be eligible for primary coverage under Medicare Part A and Part B (Medicare-primary).

The medical benefits are designed to provide comparable coverage to that provided under HealthSelect of Texas, the GBP's self-funded, point-of-service health plan, which coordinates benefits with traditional Medicare for Medicare-primary participants. All Medicare-primary participants are automatically enrolled in the MAPPO, but can choose to opt into the traditional HealthSelect plan at the beginning of any month.

Enrollment for Medicare-eligible retirees continues to increase, with 65,000 participants currently enrolled. The plan rates are set on a calendar year basis to coincide with the Medicare plan. The HealthSelect MA plan continues to provide the most cost-effective medical benefits for Medicare-primary GBP participants – for both the state and eligible members. The plan is fully insured by Humana.

Mr. Duran reviewed the basis for the MAPPO member contribution rate, which combines the HealthSelect MA premium, the HealthSelect Medicare Rx cost and the health insurance provider's fee for a total rate. For CY17, the medical portion of the rates will increase, the pharmacy cost will decrease and the HIP fee is waived. As a result, staff is recommending rates remain the same for CY17.

There being no further questions or discussion, the Board took the following action.

MOTION (14c) made by Mr. Doug Danzeiser, seconded by Ms. Ilesa Daniels and carried unanimously by the members of the Board of Trustees of the Employees Retirement System of Texas: I move that the Board of Trustees of the Employees Retirement System of Texas approve the Calendar Year 2017 plan rates as presented in this agenda item effective January 1, 2017 for the statewide HealthSelect Medicare Advantage plan as offered under the Texas Employees Group Benefits Program.

XV. Review, Discussion and Selection of a Money Market Fund for the Texa$aver 401(k) and 457 Program on or before October 14, 2016

The Texa$aver program is composed of two separate plans: the Texa$aver 401(k) plan and the Texa$aver 457 plan. The 457 plan is authorized by Section 457 of the Internal Revenue Code; the 401(k) plan, by Section 401(k). ERS is the trustee of the program, and the Executive Director is designated to administer the program under the authority of ERS' Board of Trustees. ERS maintains and administers the 401(k) and 457 plans through their respective plan documents.

Mr. Rob Kukla, Director of Benefit Contracts, and Ms. Georgina Bouton, Assistant Director of Benefit Contracts, presented an overview and proposed changes to the Texa$aver program. As of June 30, 2016, the 401(k) plan has $1.9 billion in assets and the 457 plan has $647 million in assets. There are numerous investment options, either through mutual funds or collective investment trusts (CITs); the investment offerings provided in each of the plans are the same. The investment funds offered within the 401(k) and 457 plans are the same, including a money market mutual fund. The federal Securities and Exchange Commission (SEC) issued amendments to the rules governing money market mutual funds.

These rule changes become effective October 14, 2016. Texa$aver's money market offering is the BlackRock TempFund; this fund is impacted by the upcoming SEC regulation changes.

The ERS Product Review Committee (PRC) provides guidance, direction and special expertise specific to Texa$aver. After review and analysis, the PRC recommended replacing the current BlackRock money market mutual fund with a CIT fund. Using established fund criteria, staff worked with the Texa$aver third-party administrator, Empower Retirement, to identify a pool of CIT funds to evaluate. Based on performance criteria and expense ratio, staff suggested the Black Rock Short-term Investment Fund as a new CIT fund to replace the current BlackRock TempFund. They also outlined plans for transitioning from a money market mutual fund to a CIT with participant notification. The Board clarified with staff the purpose for the change, citing liquidity fees and redemption gate issues, and that there would not be fund transition costs to participants. The recommended CIT was chosen because of better results, lower fees and diversification. Mr. Porter Wilson, ERS Executive Director, asked present PRC members for further clarification. Mr. Tom Tull, ERS Chief Investments Officer, concurred with the recommendation presented by staff.

There being no further questions or discussion, the Board took the following action.

MOTION made by Ms. Cydney Donnell, seconded by Mr. Brian Ragland and carried unanimously by the members of the Board of Trustees of the Employees Retirement System of Texas:

Based on the information provided to PRC and ERS in response to the fund selection criteria, the evaluation process and results presented to the Board at this meeting, we are making a recommendation to replace the money market offering within the Texa$aver program, thereby removing the BlackRock Liquidity TempFund (Money Market Mutual Fund – TMPXX). Therefore:

I move that the Board of Trustees of the Employees Retirement System of Texas approve the selection of the Black Rock Short-term Investment Fund as the money market fund provider within the Texa$aver Deferred Compensation Program beginning on or after September 16, 2016, conditioned on the Black Rock Short-term Investment Fund application agreement having terms that are fully acceptable to ERS, and to authorize the Executive Director to thereafter administer the fund application agreement agreed to and by the parties.

In the event that a fund application agreement that is fully satisfactory to ERS is not executed with BlackRock in a timely way, or if it appears to the Executive Director that BlackRock will not be capable of performing the required money market fund provider services to ERS' satisfaction, then the Board authorizes the Executive Director to resume the due diligence process and any negotiations with the JP Morgan CIT Fund and to negotiate and execute a fund application agreement with JP Morgan with terms that are fully acceptable to ERS, and to authorize the Executive Director to thereafter administer the fund application agreement to and by the parties.

XVI. Review, Discussion and Consideration of the ERS Fiscal Year 2017 Proposed Operating Budget

After a brief recess, Mr. Hester called for the next agenda item. Ms. Machelle Pharr, CPA and Chief Financial Officer, presented the Employees Retirement System of Texas (ERS) Proposed Operating Budget for Fiscal Year 2017. The Operating Budget contains organizational charts, budgets, methods of finance and sources of funds. It also contains Fiscal Year 2016 accomplishments and Fiscal Year 2017 major initiatives based on the most recent ERS Strategic Plan.

Ms. Pharr highlighted the Fiscal Year 2016 accomplishments – noting new legislation that improves sustainability of ERS retirement programs by increasing both the employer and employee

contributions, and the addition of a new vision insurance benefit and a new consumer-driven health plan (with optional health savings account) as part of the GBP. Additional accomplishments were the implementation of weekly Texa$aver benefit counseling; issuance of ACA-required 1095-B healthcare coverage reports for HealthSelect of Texas members; engaging members in a variety of ways; successful third-party administrator communications, and the introduction of several new wellness programs.

The FY17 operating budget will cover operation expenses from September 1, 2016 through August 31, 2017. ERS operating expenses are covered by interest from the retirement trust funds, with any unspent monies remaining in the trust funds. The operating budget supports ERS' strategic goals to support the retirement system, communicate with stakeholders for informed decision making, sustain competitive group benefits, and enhance agency performance and accountability.

Ms. Pharr outlined ERS major initiatives for FY17:

- Evaluate the current and future state of the Investment Division's systems architecture
- Expand the derivatives program
- Explore and conduct Texa$aver custom fund evaluation
- Support the 85th legislative session
- Bid, evaluate and implement the third-party administrator for HealthSelect of Texas and Consumer Directed HealthSelect, effective September 1, 2017
- Install new pharmacy benefit managers for the HealthSelect Prescription Drug Program and HealthSelect Medicare Rx, effective January 1, 2017
- Establish a benefits advisory committee for the GBP – a recommendation of the Sunset Advisory Committee
- Increase transparency in the grievance process – a recommendation of the Sunset Advisory Committee
- Continue to enhance contract oversight and management
- Conduct Summer and Fall Enrollment for members
- Complete the usability audit and redesign of the public website
- Identify alternatives for improving group benefit administration services
- Enhance data quality and data analysis capabilities
- Continue to improve data and member information security
- Continue ERS building space planning
- Apply appropriate stakeholder input to design employee programs based on the Survey of Employee Engagement

Mr. Porter Wilson, ERS Executive Director, noted the new benefits advisory committee would be formed after the upcoming legislative session.

Ms. Pharr presented an overview of the budget. The FY17 proposed operating budget is $5.9 million, or 8.45% over FY16. Significant budget increases are salary related, with a request for 11 additional full-time employees. Additionally, funds are requested for one-time expenses for actuarial services, the 2017 Trustee Election and space planning/building renovation.

Another initiative is relocation of the data center. The total one-time cost of the data center relocation is about $1.2 million, including $120,000 expended in FY16. There are one-time costs included of $570,000 in FY17, and ongoing costs are anticipated to be $308,000. Other initiatives in the Business Process Review and Improvement category include the evaluation of a benefit administration system; development of an RFP and implementation of a contract management system, as well as reviewing the Investment Division's system architecture.

In terms of Investments' operations, additional funding was included to reflect additional index data for the Investment Risk System. Funding was also included for an investment banking contractual increase.

The last category is Data Integrity and Security, including additional data sources for our data

warehouse, annual maintenance increases, security counseling and consulting services. Some funding for additional contractors was included for testing of various systems.

The Investments Division and investment-related resources in other divisions total approximately 40% of the ERS' budget. As with the rest of the agency, approximately 61% of the budget is salaries.

Exhibit B notes the various contracts anticipated during FY17. The Executive Director is authorized to contract on behalf of ERS for these contracts. Also included in Exhibit B is a listing of the investment advisory fees estimated for FY17.

Exhibit E provides a statistical trend of the operating budget, full-time employees, and various other pieces of information or metrics from FY09 through FY17. Also, a listing of some of the increases in complexities we have added to our programs over the course of the last few years is included in Exhibit E.

The Board and staff discussed the budget's detail and custodial fees for the System's assets. Ms. Betty Martin, CPA, Director of Investment Services, and Ms. Pharr clarified the custodial fee percentage. The Board and Mr. Porter Wilson, Executive Director, discussed requested budgetary increases as a result of one time expenditures and personnel growth. Board members, Mr. Wilson and Ms. Robin Hardaway, Director of Customer Benefits, discussed customer service levels, wait times and interactions with members.

> **MOTION** made by Mr. Craig Hester that the Board of Trustees of the Employees Retirement System of Texas approve the *Fiscal Year 2017 Proposed Operating Budget*, for the Employees Retirement System of Texas as presented, and including the amendment that an additional 1% of relevant salary be available for recognizing, retaining and recruiting non-Investments staff (that would be 1% of the non-Investments staff payroll added to the budget) and authorize the Executive Director to administer the operating budget as necessary for the efficient and effective administration of the System, and authorize the transfer of interest from the interest account as required to fund the operating budget. These motions were seconded by Ms. Cydney Donnell and carried unanimously by the present members of the Board of Trustees of the Employees Retirement System of Texas.

XVII. Review, Discussion and Consideration of the ERS Incentive Compensation Plan

Ms. DeeDee Sterns, Director of Human Resources, highlighted recommended changes for the Incentive Compensation Plan for Fiscal Year 2017. In December, 2006, the Board of Trustees (Board) approved the ERS Incentive Compensation Plan (Plan or ICP). During the May board meeting, staff presented a draft ICP plan with revisions for discussion. The plan communicates strategic performance priorities to certain ERS staff. The proposed revisions seek to simplify and clarify expectations while maintaining the overall objective. Staff annually reviews the plan and related processes and recommends revisions to the Board.

Some of the proposed revisions are to modify the eligibility date for new hires. Staff recommends deferring eligibility in the plan to the first of the month following a six month employment period. The plan will allow for the use of the Board's or the Executive Director's discretion after a 90 day employment period, under limited circumstances and if written justification warrants it.

Staff recommends the participant's weighted salary be used to calculate the Incentive Compensation Award instead of the participant's salary as of the last day of the plan year.

Additional plan process improvements include centralized administration of plan oversight in Human Resources, assigning who will perform the calculation of awards, inclusion of global investment

performance standards, refine payment dates, and retain current qualitative performance goals and metrics. Mr. Craig Hester, Chair, previously requested to add the definition of weighted salary. Mr. Porter Wilson, Executive Director, noted last years' experience administering the plan combined with recommendations from Internal Audit and the State Auditor's office contributed to improvement in the policy document. Ms. Sterns confirmed that Excel Global Partners will conduct the award verifications.

Based on internal discussions among Human Resources, Investments, Legal Services, and the Executive Office, in addition to discussion at the May board meeting, staff recommends the following:

MOTION made by Ms. Cydney Donnell that the Board of Trustees of the Employees Retirement System of Texas approves the ERS Incentive Compensation Plan for key investment professionals and leadership employees as presented in Exhibit A. This motion was seconded by Mr. Brian Ragland and carried unanimously by the present members of the Board of Trustees of the Employee Retirement System of Texas.

XVIII. Review, Discussion and Consideration of the 2017 ERS Trustee Election Calendar

Mr. Bernie Hajovsky, Director of the Enterprise Planning Office, presented information on the 2017 Board of Trustee election process and staff recommendation for the 2017 election calendar. Board of Trustee elected member Brian Ragland's term will expire August 31, 2017. Rules require the Board adopt a calendar prior to each election.

To be eligible to run, state employees must be contributing ERS class members. State employees working for the Texas Health and Human Services Commission and the Texas Department of Insurance are excluded because those agencies are already represented on the Board.

As of January 31, 2017, if an employee has an ERS account balance, or a retiree receives an annuity from ERS, they are eligible to vote. All eligible voters can cast their ballot by mail or online. As a new feature, reminder emails will be sent to eligible voters. The reminder email will have an imbedded link that will allow eligible voters to be automatically directed to the online voting portal and cast their ballot. The provision that disqualifies both votes for any member who votes twice has been eliminated. In such cases, the first vote received, either paper or electronic, will count as the official vote of record.

Survey and Ballot Systems serves as our third-party administrator for the election. The election budget for 2017 is $261,000, with the majority of those funds paying for postage. For the 2015 election, 308,000 eligible voters were mailed ballots.

The election process runs from January through May 2017. Beginning January 2, nominating petitions are distributed. The nomination period closes February 1. On February 15, eligible candidates are certified and the ballot order is determined. The candidate forum is scheduled for March 9; the forum is an opportunity for members and retirees to hear from the candidates. Voting begins March 10 and ends April 14. On May 10, the new trustee-elect is announced. There is no run-off election; the candidate with the most votes is the trustee-elect.

The Board and staff discussed the expense of paper ballots and postage, noting electronic voting would decrease costs significantly. With new technological advances, ERS hopes to reduce reliance on paper ballots without lowering voter participation. It was noted that some non-contributing members, active employees and retirees may not have ready access to a computer to vote online. While the postage costs are substantial, the election is an important process. The Board noted that voting closes on April 14, Good Friday.

MOTION made by Ms. Cydney Donnell that the Board of Trustees of the Employees Retirement System of Texas adopt the 2017 Trustee Election Calendar as presented in this agenda item. This motion

was seconded by Ms. Ilesa Daniels and carried unanimously by the present members of the Board of Trustees of the Employees Retirement System of Texas.

XIX. Elections of Chair and Vice-Chair of the ERS Board of Trustees for Fiscal Year 2017

Texas Government Code, Title 8, §815.201, provides that the Board shall elect new officers from its membership. As a result of such an election, the newly elected Chair and Vice-Chair of the ERS Board of Trustees will each serve a one-year term beginning September 1, 2016 and ending August 31, 2017.

Ms. Donnell noted that Chair Hester was doing a great job. Mr. Danzeiser expressed appreciation for Mr. Hester's willingness to serve such a big commitment. Mr. Hester appointed Mr. Brian Ragland to serve as Audit Chair for FY17.

MOTION made by Ms. Cydney Donnell that the Board of Trustees of the Employees Retirement System of Texas re-elect Mr. Craig Hester as Chair and Mr. Doug Danzeiser as Vice-Chair of the ERS Board of Trustees for one-year terms beginning September 1, 2016 and ending August 31, 2017.

This motion was seconded by Mr. Brian Ragland and carried unanimously by the present members of the Board of Trustees of the Employees Retirement System of Texas.

XX. Executive Director Agency Update

- **Sunset Update**
- **Legislative Appropriations Request for Fiscal Years 2018-2019**
- **Fiscal Year 2017 Roadmap Development**
- **Space Planning Update**
- **Summer Enrollment Plan Year 2017**
- **ERS Medical Board Retirements**
- **SECC Excellence in Philanthropy Award**
- **Investments Update**

Mr. Porter Wilson, ERS Executive Director, presented the agency update. Recognizing ERS staff and their great work, Mr. Wilson explained ERS capable staff would assist him with the overview.

Sunset Staff Recommendations

Mr. Wilson asked Mr. Keith Yawn, Enterprise Planning Office, to review recommendations and ERS' responses. The Sunset Committee hearing before the Sunset Commission is next week and ERS leadership will attend. Since the Sunset staff report was issued, ERS has been reviewing recommendations and strategizing implementation plans. Multidisciplinary ERS teams have determined a plan of action to address the report findings addressing legislative concerns while improving services to members and operations at the agency.

Recommendations are divided into three implementation categories:

- Organizational actions are recommendations ERS can take action on and address by the end of 2016 with no statutory changes and within existing agency resources. Creating the Office of Procurement & Contract Oversight is an example of organizational action.
- The development category involves recommendation proposals that may require additional resources, clarification from Sunset or long-term timelines to implement – such as policy, process or organizational changes.
- The third involves recommendations requiring approval by the legislature or changes to statutory language to implement. The creation of a health program advisory committee is an example of this category. ERS will seek to participate in the development of statutory language for these items as opportunities allow. Although the Agency is able to enact current

recommendations, ERS looks to the Sunset Advisory Commission and the Texas Legislature for input and guidance.

ERS Legislative Appropriations Request (LAR) for Fiscal Years 2018-2019

Presented by Ms. Machelle Pharr, CPA and Chief Financial Officer, the FY18-19 base appropriations request totals $5.2 billion -- $1.4 billion for retirement and $5.2 billion for the Texas Employees Group Benefits Program. ERS works with the Legislative Budget Board and the Office of the Governor to determine the base level of funding for the retirement and insurance programs. The LAR is due August 26, 2016. Retirement and the GBP are exempted from the 4% reduction in budgets requested by the Governor; ERS was instructed to maintain funding at the FY17 levels for both Fiscal Years 2018 and 2019. Items above base-level funding are considered "exceptional items" and must be itemized, prioritized and justified in the LAR document.

Fiscal Year 2017 Roadmaps - Strategic Planning for Major Projects

Ms. Pharr and Mr. Bernie Hajovsky, Director of the Enterprise Planning Office, reviewed agency project planning for the next 12 to 18 months. With 70 projects planned, Mr. Hajovsky highlighted a few major initiatives – so-called "roadmap" items.

- Solicit Benefits Administration Services – The request for proposal (RFP) will be issued in 2017.
- Solicit HealthSelect Third-Party Administrator – The RFP was issued in June.
- Conduct Asset Liability Study – February 2018 is target for the adoption of the new asset allocation.
- Implement Contract Content System – In 2017, have a central repository for all ERS contracting and information, including reporting requirements to oversight bodies.
- Implement Data Center Move – The RFP has been issued, with expected implementation in January 2017.
- Implement Public Website Redesign – The content and usability assessment is currently taking place.
- Implement Sunset Recommendations – Recommendations will continue to be implemented throughout 2017.
- Space Planning Implementation – The assessment is ongoing.

Space Planning Update

Ms. Jordan Hajovsky and Ms. Wendy McAdams, Co-Directors of Operations Support, presented a space planning project update. A geotechnical analysis of the building foundation was conducted over two days, and coring samples were taken both inside and outside. Exterior cores went down to 50 feet, while internal cores hit solid rock at 12 feet. The Board asked several questions about the project and core samples were passed around. The purpose of the engineering study was to evaluate the pertinent geotechnical conditions at ERS site and to develop geotechnical parameters, which will assist in the design and construction of structural improvements and renovations. The engineers will use the study to determine whether the buildings can support additional floors. ERS will receive the results from the structural analysis in the coming weeks.

Plan Year 2017 Summer Enrollment for employees, pre-Medicare retirees and their families

Ms. Robin Hardaway, Director of Customer Benefits, and Ms. Kathryn Tesar, Director of Benefits Communications, reviewed this year's Summer Enrollment. During Summer Enrollment, ERS mailed 277,000 Personal Benefits Enrollment Statement (PBES) packets. The ERS Contact Center and ACT, the "overflow" call center, received 14,193 phone calls. More than 63,000 members made coverage changes, and 51 members visited ERS in person.

To educate participants, ERS held 35 fairs across Texas with 5,455 attendees and 10 webinars with 956 participants. Ms. Tesar noted increased attendance at the fairs over last year, probably driven by substantial interest in the new vision plan. The well attended fairs afforded staff an opportunity to visit with members. Three new plans were offered:

- State of Texas Vision, administered by Superior Vision Services, Inc., enrolled 56,413 members.

- Consumer Directed HealthSelect, the new high-deductible health plan with health savings account, administered by UnitedHealthcare and Optum Bank, respectively, enrolled 346 participants.
- A limited flexible spending account, the TexFlex LFSA, can be used by Consumer Directed HealthSelect members for vision and dental expenses. A total of 35 participants enrolled.

ERS Medical Board

Ms. Hardaway explained the Medical Board meets weekly to review disability retirement cases and provide guidance and recommendations. Two Medical Board members recently retired: Dr. Marvin Cressman, a prominent neurosurgeon who served for ten years, and Dr. William McCarron, a highly regarded cardiologist who served for four years. As ERS works to fill their positions, two respected doctors will serve as interim Medical Board members: Dr. Ace Alsup, an Internal Medicine physician, and Dr. William Taylor, an orthopedic surgeon.

ERS' State Employee Charitable Campaign (SECC) Receives Excellence in Philanthropy Award

Mr. Wilson recognized and thanked Ms. Beth Gilbert, Internal Audit Division, as the SECC lead. United Way for Greater Austin (UWATX), the manager for the SECC, honored ERS for an outstanding campaign in 2015. In February 2015, ERS was recognized for all three SECC achievement categories: Highest Per-Capita Gift, Greatest Increase in Campaign and Highest Percent Participation. ERS was the only state agency recognized for outstanding achievement. Ms. Gilbert announced Ms. Carla Lawrence, Customer Benefits Division, would lead the SECC in FY17.

Investments Update

Mr. Wilson congratulated Bob Sessa and the Real Estate Team on winning the 2016 Investments and Pensions Europe (IPE) Real Estate Award for the Best Listed Strategy. He also congratulated Leighton Shantz and the ERS Fixed Income Team, who were featured in *The DESK* magazine's lead article, "Trading for Retirement Funds."

XXI. <u>Evaluate the duties, performance and compensation of the Executive Director of the Employees Retirement System of Texas</u>

EXECUTIVE SESSION – In accordance with Section 551.074, Texas Government Code, the Board of Trustees will meet in executive session to evaluate the duties, performance and compensation of the Executive Director of the Employees Retirement System of Texas; and to deliberate the appointment, employment, evaluation, reassignment, duties, discipline or dismissal of one or more public officers or employees. Thereafter, the Board may consider appropriate action in open session.

Last year the Board of Trustees set out specific evaluation criteria for Executive Director Porter Wilson. Some of these criteria included expectations for leadership, management communications and policy matters as well as staff development. He is also accountable to lead initiatives as set forth in the agency budget. We reviewed the outcomes and Mr. Wilson and his team have met these expectations and done excellent work in continuing to secure the trust for the retirement and insurance benefit programs for active and retired members. We commend Mr. Wilson for his leadership in managing the budget, reducing agency turnover, developing the senior team, overseeing a successful Sunset evaluation and keeping the Board informed.

MOTION made by Ms. Cydney Donnell that the Board of Trustees of the Employees Retirement System of Texas award ERS Executive Director Porter Wilson an increase in his annual compensation of 4% of FY16 annual salary effective September 1, 2016. And further move that the Executive Director be awarded the maximum incentive compensation for which he is eligible based on his participation in the Incentive Compensation Plan for FY16 for the qualitative 66% of his 50%, which reflects his leadership and management accomplishments for the year and on the quantitative 100% of 50%. And further move that staff amend Appendix B of the Incentive Compensation Plan to

reflect that his discretionary metrics equal 50% and his quantitative metrics equal 50% as reflected in relative Trust performance. The motion was seconded by Mr. Brian Ragland, and carried unanimously by the present members of the Board of Trustees of the Employees Retirement System of Texas.

MOTION made by Ms. Cydney Donnell that the Board of Trustees of the Employees Retirement System of Texas affirm that effective September 1, 2016, that ERS Executive Director Porter Wilson is approved to participate in the ERS Incentive Compensation Plan for key investment professionals and leadership employees as a leadership employee with a maximum award percentage available of 100% of his salary in accordance with the terms of the plan. I further move that Mr. Wilson's performance goals for FY17 shall reflect 50% of his possible award under the ICP as a quantitative goal of relative Trust performance and 50% of his possible award under the ICP as a qualitative goal reflecting his overall agency leadership, management, communications, policy matters, staff development and implementation of the agency's strategic initiatives as reflected in the Board's approved operating budget for Fiscal Year 2017. I further move that the ICP be amended to reflect the terms of this motion and that ERS Human Resources be directed to finalize the documentation to implement the terms of this motion. The motion was seconded by Mr. Doug Danzeiser, and carried unanimously by the present members of the Board.

MOTION made by Ms. Cydney Donnell that the Board of Trustees of the Employees Retirement System of Texas use the agency initiatives identified in the Fiscal Year 2017 operating budget and approved by the Board to evaluate the Executive Director's job performance by measuring the initiatives against the accomplishments reported in Fiscal Year 2017 operational budget. Motion was seconded by Mr. Brian Ragland, and carried unanimously by the present members of the Board.

XXII. Select Date for the Next Joint Meeting of the ERS Board of Trustees and Investment Advisory Committee, the Next Meeting of the Board of Trustees, and the Next Meeting of the Audit Committee

Mr. Craig Hester, Board Chair, acknowledged the next Joint Meeting of the ERS Board of Trustees, Investment Advisory Committee and Audit Committee would be a workshop on Thursday and Friday, December 1 and 2, 2016 at the ERS offices.

XXIII. ADJOURNMENT OF THE ERS BOARD OF TRUSTEES

Mr. Hester noted the completion of agenda items and adjourned the ERS Board of Trustees.

PUBLIC AGENDA ITEM - #14

14. Executive Session

December 2, 2016

Executive Session – In accordance with section 551.074, Texas Government Code, the Board of Trustees will meet in executive session to evaluate the duties, performance and compensation of the Internal Auditor of the Employees Retirement System of Texas. Thereafter the Board may consider appropriate action in open session.

PUBLIC AGENDA ITEM - #15

15. Review, Discussion and Selection of the Third-Party Administrator for HealthSelect℠ of Texas, Including Consumer Directed HealthSelect℠

December 2, 2016

BACKGROUND:

HealthSelect℠ of Texas (HealthSelect) is a statewide self-funded health benefit plan offered under the Texas Employees Group Benefits Program (GBP). It is administered by the Employees Retirement System of Texas (ERS) and a qualified third-party administrator (TPA). ERS' current contract for HealthSelect TPA services terminates on August 31, 2017.

HealthSelect Governance

HealthSelect is administered in accordance with Chapter 1551, Texas Insurance Code, Title 34, Part IV, Texas Administrative Code, Chapter 81; and the Master Benefit Plan Documents for the In-Area, Out-of-Area, and Consumer Directed HealthSelect plans (the HealthSelect Plans).

The TPA provides health-care administration services including customer service, claims processing, provider network management and medical utilization review for HealthSelect. HealthSelect includes the GBP's self-funded, managed care, point-of-service health plan and ConsumerDirect HealthSelect, a self-funded high deductible health plan.

Current TPA Contract

ERS entered into a four (4) year contract with United HealthCare Services, Inc. to provide TPA services for HealthSelect for a period from September 1, 2012 through August 31, 2016. ERS had the ability to extend the contract for two years after the initial four year term. ERS extended the contract with United HealthCare Services, Inc. for an additional one (1) year period that will end on August 31, 2017.

Issuance of Request for Proposals

On June 23, 2016, ERS issued a Request for Proposals (RFP) seeking a qualified vendor to provide TPA services for the HealthSelect Plans. The contract has a term of six (6) years.

Responses to the RFP

Twenty-three companies requested access to the RFP.

By the RFP submission deadline on August 11, 2016, ERS received proposals for HealthSelect TPA services (Proposals) from two entities:

- Blue Cross and Blue Shield of Texas, an operating division of Health Care Service Corporation, a mutual legal reserve company (BCBSTX); and
- United HealthCare Services, Inc. (UHC).

Evaluation

August 2016 – November 2016

Article III of the RFP outlines the process used by ERS to evaluate the Proposals. The evaluation was conducted in three phases:

1. Preliminary Review Evaluation

The Preliminary Review included evaluation of the minimum requirements and compliance with the RFP.

Minimum Requirements. The RFP required each Respondent to provide evidence that the following minimum requirements were satisfied:

- Principal Place of Business. The Respondent shall maintain its principal place of business in the United States.
- Professional Licensure and Certifications. The Respondent shall hold all necessary and appropriate business and professional licenses and/or certifications necessary to provide health care third-party administrative services during the contract term.
- Demonstrated Experience as a Third-Party Administrator. The Respondent shall have experience providing administrative, claim processing, network management and utilization review services for a single organization with member participation of no less than 100,000 and manage a book of business with an aggregate of 3,000,000 covered lives for a minimum of five years, at the time of Proposal submission.
- Demonstrated Provider Network. The Respondent shall have a provider network capable of effectively servicing the HealthSelect membership (approximately 450,000 lives) in all Texas counties (both urban and rural) without significant access disruption, at the time of Proposal submission.
- Net Worth and Liquidity. The Respondent shall have a current net worth of $1 billion. In addition, since the Respondent may be required to advance up to three days of claim payments totaling approximately $20 million before being reimbursed by ERS, the Respondent shall have at least $100 million in cash and cash equivalents available (on average) as of close of its most recent fiscal year.

ERS' Office of Procurement and Contract Oversight (OPCO) reviewed the Proposals against the preliminary review evaluation criteria and deemed both responsive.

2. Proposal Review Evaluation

The Proposals were reviewed by the RFP evaluation team which includes expert staff throughout ERS and Rudd and Wisdom, ERS' consulting actuaries for insurance. Each reviewer was assigned only those sections of the RFP that corresponded to their subject matter expertise.

ERS has very high expectations of the service level required from its vendors. The evaluation process includes considerable attention to the various types of service required of the Respondent under the proposed contract. The evaluation process is a means to help the evaluation team develop a better understanding of the levels of service expected from the Respondents under the proposed contract.

The Proposal Review evaluation included review of (i) the Respondent's total cost, which was based on the financial requirements and specifications and the price proposal (Total Cost), and (ii) the Respondent's operational capabilities and services. The review included an analysis of each Respondent's original Proposal and initial clarification responses. More specifically, the Proposal Review evaluation included the following elements:

Total Cost based on Financial Requirements and Specifications and Price Proposal. ERS staff, in conjunction with Rudd and Wisdom, performed a review of each Respondent's Total Cost (which included a review of financial requirements and specifications and the price proposal). Total Cost accounted for sixty percent (60%) of the total score. This review included analyzing the Respondent's administrative fee, provider reimbursement, and healthcare management incentive.

Operational Capabilities and Services. The RFP evaluation team analyzed Respondents based on their ability to provide quality operational services. The operational capabilities and services accounted for forty percent (40%) of the total score. The review of each Respondent's operational capabilities and services included the following:

- Provider Network Requirements, Provider Contracting and Network Management Capabilities. The Respondents were evaluated on their ability to provide initial and ongoing recruitment, credentialing, and contracting with a sufficient number of qualified and duly licensed health care providers to provide the full range of covered benefits and services to all participants statewide. The Respondents were also evaluated on utilization and medical services management (including the responsibility for cost containment procedures, preauthorization services, and utilization review activities) and quality assurance.

- Programs and Optional Services. The Respondents were evaluated on their ability to provide programs such as medical home programs, accountable care organizations, remote health (telemedicine) programs, and any other optional services that provide the participants with greater program efficiencies, effectiveness and cost savings.

- Communication Requirements. The RFP required Respondents to demonstrate experience in executing an effective communication strategy that promotes participant education and engagement. These communication services include, but are not limited to, marketing and communication materials; website portals; Section 508 compliance/accessibility; printing of additional communication materials; ability to actively engage in annual enrollment fairs; capability to support customized communication materials; and development of a Master Benefit Plan Document.

- Information Systems Requirements. The technological capabilities that were evaluated included, but were not limited to, data and information operations, data interfaces, securely receiving and transmitting data, fault tolerance methodology and practices, quality control, business analysis and development processes, and information security and data security practices, including business resumption and disaster recovery plans.

- Operational Specifications. ERS strongly believes that the account service relationship is the critical link in developing and maintaining a strong working relationship dedicated to the achievement of program objectives. Respondents are required to provide ERS with service at the highest industry levels and fully consistent with ERS' expectations. The Respondents were evaluated based on their ability to provide quality operational services throughout implementation and on a post-implementation basis. The operational services extend to participant benefit structure capabilities, implementation requirements; project management; call center operations, staffing and technology; enrollment system and administration; account management requirements; claims processing; reporting; funding and reimbursement methodology; invoice reporting; and financial standings.

Clarifications. As part of the evaluation process, the team identified areas of the Proposals that required further clarification. The primary objective of this process is to ensure mutual understanding of each Respondent's Proposal. During the Proposal Review evaluation, this process is designed to ensure the RFP evaluation team has sufficient information to score the Proposals.

3. Finalists Evaluation

Based on the Proposal Review evaluation, ERS selected both BCBSTX and UHC as finalists and moved them to the Finalists Evaluation phase. The Finalists Evaluation phase included site visits to both entities' data and call centers, face-to-face interviews, the submission of best and final offers (BAFOs), review of past performance, contractibility, and other legal requirements and regulatory compliance. Evaluators were able to consider any new or clarified information gathered during site visits and face-to-face interviews and adjust their scores accordingly. BAFOs were taken into account when finalizing the Total Cost score. Additionally, past performance, site visits, contractibility, and other legal requirements and regulatory compliance were scored on a pass/fail basis.

Site Visits. ERS performed site visits at ERS' expense to each Respondent's operations center, call center, and/or data center facilities. The site visits took place as follows:

(a) BCBSTX Site Visits
- Data Center: The Data Center site visit to BCBSTX's facility located in Waukegan, Illinois was conducted in October.
- Call Center: The Call Center site visit to BCBSTX's facility located in Abilene, Texas was conducted in October.

(b) UHC Site Visit
- Data Center: The Data Center site visit to UHC's data center located in Elk River, Minnesota was conducted in October.
- Call Center: The Call Center site visit to UHC's call center located in San Antonio, Texas was conducted in October.

Face-to-Face Finalist Interviews (Oral Presentations/Discussions). The finalist interviews were held on October 31 and November 1, 2016, in Austin, Texas at ERS' offices. Each session included a presentation by the respective Respondent, discussion of key issues, and extensive questioning of the Respondent's representatives by ERS staff.

Presentations and discussions during the interview provide an opportunity for finalists to highlight the strengths and unique aspects of their proposals and to provide answers to questions that ERS staff may have regarding the proposal. Topics discussed at these sessions included contractual and performance expectations; organizational information; administrative, account management and customer service considerations; claims, billing, and reimbursement processing; information technology capabilities; and project management/implementation methodologies. The time commitment and the format were the same for both finalists. A prepared agenda ensured consistency in this process.

Best and Final Offer. The finalists were asked to prepare and submit BAFOs prior to the face-to-face interviews which were then scored by the appropriate team members.

Finalist Past Performance. ERS' conducts reference checks and reviews the Texas Comptroller's Vendor Performance Tracking System as part of the due diligence to verify a Respondent's past performance. These processes are scored on a pass/fail basis.

Reference Checks. Respondents are required to provide client references for ERS to use for reference checks. In addition, ERS may also contact other entities who use the Respondents' services. ERS may also rely on its own experience as part of this check if a finalist has performed similar or the same services for ERS in the past ten (10) years. ERS staff conducted reference checks on each Respondent based on client information provided. Additionally, ERS relied on its own past experience for each finalist since both finalists performed TPA services for ERS within the past ten (10) year period.

Texas Comptroller's Vendor Performance Tracking System. ERS reviewed each finalist's vendor performance as reported in the Texas Comptroller's Vendor Performance Tracking System in accordance with Section 2262.055 of the Texas Government Code.

Contractibility and Other Legal Requirements and Regulatory Compliance. Each Respondent submitted extensive disclosures regarding such issues as litigation, regulatory proceedings, investigations, mergers, acquisitions, and reorganizations. Finalists were also required to sign contractual agreements acceptable to ERS. Contractibility and Other Legal Requirements and Regulatory Compliance were scored on a pass/fail basis.

Final Evaluation and Recommendation. Based on the information provided throughout the extensive evaluation process, both finalists demonstrated the capabilities to provide TPA services in accordance with the RFP. While both Respondents are capable, the RFP evaluation team determined that there were factors useful to differentiate the finalists.

Once all of the scoring and due diligence was completed, a team, consisting of staff from Executive Office, Benefit Contracts, Office of the General Counsel, and OPCO, along with Rudd and Wisdom, reviewed the findings of the cross-divisional RFP evaluation team.

STAFF RECOMMENDATION:

Based on the scoring of the submitted Proposals, clarifications, face-to-face meetings, site visits, BAFO, past performance, contractibility, and other legal requirements and regulatory compliance, the Director of Procurement and Contract Oversight was able to make a determination regarding best value for TPA services for the HealthSelect program.

ERS staff will present a recommendation to the Board for the qualified Respondent to provide TPA services for HealthSelect, including Consumer Directed HealthSelect, under the Texas Employees Group Benefits Program for the initial six-year term beginning September 1, 2017 and ending August 31, 2023. Per Texas Insurance Code section 1551.212, the Board of Trustees shall select the carrier that will be in the best interest of the GBP participants.

The proposed motion is included with this agenda item.

PUBLIC AGENDA ITEM -#16

16. Review and Discussion of the Deferred Compensation Program Texa$aver 401(k) and 457 Plans and Monitoring Strategy Overview

December 2, 2016

Background

The Employees Retirement System of Texas ("ERS") contracts with providers to perform administrative, investment advisory and custodial services for the plans offered within the Texa$aver Program ("Texa$aver" or "Program"). Each contract defines the services and deliverables that are to be performed in the administration and delivery of the services associated with the Program. As such, each contract sets forth conditions whereby the vendor's failure to meet the contractual requirements may result in performance guarantee assessment(s) and/or liquidated damages.

Certified Texas Contract Manager

Monitoring the Program vendors' adherence to the contractual requirements is performed by members of the Deferred Compensation specialist team within the Benefit Contracts Division. Pursuant to Texas Government Code, Section 2262.053 and the *State of Texas Procurement Manual*[1], the Deferred Compensation specialists are required to undergo training to be designated as a Certified Texas Contract Manager ("CTCM"). As part of the eligibility requirements for the CTCM certification, the specialist shall possess at least one year of contract management experience and complete the Contract Management segment courses administered by the Texas Procurement and Support Services ("TPASS") provided by the Texas Comptroller of Public Accounts ("CPA" or "Comptroller").

Contract Monitoring Strategy

The scope of the Program's contract administration refers to the processes that occur after a contract is signed[2] and includes methods used to monitor overall vendor performance. Therefore, performance monitoring of the Deferred Compensation vendors is a key aspect of the contract management responsibilities. The level and frequency of performance monitoring may vary among the Deferred Compensation vendor contracts because the monitoring criteria is based on the criticality of the contract. It is important to note that the Deferred Compensation specialist will follow a contract monitoring strategy developed for ERS benefit programs.

Similar to the monitoring strategy employed for the Group Benefits Program ("GBP"), the Texa$aver Program monitoring strategy is comprised of several contract monitoring activities. These activities are organized on a calendar year basis to align with the plan year of the Program. The key objectives of the contract monitoring strategy include, but are not limited to, the following:

- Review and report the Program vendor's adherence in meeting the delivery points and maintaining acceptable customer service levels;
- Initiate and track recommendations identified through formal compliance audits, strategic planning and contract monitoring activities;
- Review the methodology used by the Program vendor in developing self-reported data reflected within the Monthly Monitoring Report;
- Review key metrics including adherence to specified service level expectations and performance standards;
- Identify opportunities to develop and deploy enhanced requirements (i.e. directives, strategic initiatives, plan changes); and
- Coordinate the engagement of a compliance audit of the vendor by an independent auditing firm selected by ERS through a competitive procurement process.

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[1] Texas State Comptroller of Public Accounts, *State of Texas Procurement Manual,* pg. 14. http://www.comptroller.texas.gov/procurement/pub/manual/ProcurementManual.pdf

[2] State of Texas Contract Management Guide, version 1.14, 01-Sep-2015, page 15. http://comptroller.texas.gov/procurement/pub/contractguide/contract-mgmt-guide-v1.14.pdf

Contract Monitoring: Texa$aver Program

The Texa$aver 401(k) and 457 Plans comprise a voluntary tax-deferred supplemental retirement program. The Program serves as a component of personal savings, thereby complementing benefits received from pension and Social Security, as applicable.

The Deferred Compensation specialist's uses various tactics to accomplish the contract monitoring objectives described above. Some of these tactics include, but are not be limited to, the following:

- Conduct cross-divisional operational meetings;
- Facilitate strategic planning meetings;
- Identify potential issues and track results from the Monthly Monitoring Report; plan performance reports; and annual executive reports;
- Confirm compliance with provided directives, as applicable; and
- Review findings from compliance audits.

The Monthly Monitoring Report is specific to the Texa$aver Program contracts and designed to be a comprehensive monitoring tool for the Deferred Compensation specialists.

Monitoring: Monthly Monitoring Report

As previously noted, the Monthly Monitoring Report ("MMR") is a component of the overall Contract Monitoring Strategy. The customized report reflects specific Contractual Agreement ("Contract") performance areas and includes all performance guarantee standards. As such, the Program vendor must report its performance within each stipulated service and/or operational component.

- <u>Texa$aver Third Party Administrator (TPA) contract, Calendar Year (CY) 2016:</u>
  The MMR captures sixteen (16) criteria that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four major categories:
  - Account Management with 5 criteria;
  - Customer Service with 3 criteria;
  - Operations with 3 criteria; and
  - Systems and Data Management with 5 criteria.

From the Monthly Monitoring Reports, the Deferred Compensation specialist is able to track the performance areas at a plan level. Examples of these performance areas include, but are not limited to, the following:

- Field Representative activities and actions;
- Loan requests processed;
- Enrollment processing times;
- Account processing activities; and
- Investment Fund house reconciliations.

The Program vendors are responsible for providing MMRs and other contract deliverables according to timelines set forth within the Contract. The vendor's failure to meet any of the requirements stipulated within the Contract may result in a monetary assessment in the form a performance assessment.

Monitoring: Performance Guarantees

The Performance Guarantees are formulated during the procurement process and specify the service expectations that the Program vendor is to perform throughout the Contract period. The Performance Guarantee is an appendix to the Contract and is presented into two sections.

Section 1 provides the comprehensive listing of performance expectations with a description of the business-critical service functions to be performed by the GBP vendor. This section also provides the reporting frequency and the metrics for each listed business-critical service function.

Section 2 discloses the total dollar amount that the vendor has placed at risk ("amount at risk") to ensure its contract performance meets or exceeds the service level standards set forth within the Contract. The amount at risk is a function of the contact value. Assessments for any single plan year will not exceed the

total amount placed at risk. This section is illustrative of the four (4) severity levels assigned to each business-critical service function listed in Section 1 as reflected below:

Level of Severity	Definition	Allocation of Amount at Risk
Severity 1 – Emergency	Mission critical systems are down; or a substantial loss of service; or business operations has been severely disrupted; or a major milestone has not been met. In each situation, no work-around that is acceptable to ERS is immediately available.	50% of the aggregate annual amount at risk for each occurrence
Severity 2 – Critical	A major functionality is severely impaired. Operations can continue in a restricted fashion; however, client and/or member service(s) are adversely affected.	25% of aggregate annual amount at risk for each occurrence
Severity 3 – Moderate	Business operations have been adversely impaired in a moderate manner. A temporary work-around that is acceptable to ERS is immediately available.	• Occurrence 1 = 3% of aggregate annual amount at risk • Occurrence 2 = 5% of aggregate annual amount at risk • Occurrence 3 = 6% of aggregate annual amount at risk • Occurrence 4 = 9% of aggregate annual amount at risk
Severity 4 – Minor	Business operations have been adversely affected in a limited manner requiring a modification of current policies and/or processes.	2% of aggregate annual amount at risk for each occurrence

- The Texa$aver TPA contract for CY2016 contains 16 Performance Guarantee service functions:
    - Severity Level 1: 2 service functions
    - Severity Level 2: 2 service functions
    - Severity Level 3: 4 service functions
    - Severity Level 4: 8 service functions

Exhibit A – Texa$aver Program Overview

This agenda item is presented for discussion purposes only. No action is required.

Exhibit A

Texa$aver Program Overview

The Texa$aver Program consists of two distinct plans:

- Texa$aver 457 Plan - authorized by Section 457 of the Internal Revenue Code
- Texa$aver 401(k) Plan authorized by Section 401(k) of the Internal Revenue Code ("IRC")

The ERS Board of Trustees ("Board") is the trustee of the Program, and the ERS Executive Director is designated to administer the Program under the Board's authority.

The 457 Plan originated in 1974 and is available to of state agencys and higher education employees. The 401(k) Plan was launched in 1985 and is available to state agency employees only. As of January 1, 2008, new state employees are automatically enrolled into the Texa$aver 401(k) Plan at 1% of salary.

Employees can choose to defer higher amounts or opt out of participating in the Program. Currently there are 74,502 (or 34.4%) participants in the Texa$aver Program that are still at the default one percent contribution rate.

Contributions. Both the 457 and 401(k) Plans allow participants the opportunity to invest part of their income through salary deductions. Participants can choose either a percentage of salary or a fixed dollar amount for their monthly contribution. Current IRS guidelines allow maximum annual contributions of $18,000 per account, providing state employees the opportunity to save up to $36,000 a year in both retirement accounts. Employees over age 50 may contribute an additional $6,000 per year per account. Participants can choose to automatically escalate their contributions each year up to the maximum allowable amount set by the IRS.

In addition to being a convenient method of saving, salary deductions allow the participant to defer paying taxes on the contributions and earnings until they terminate employment or retire. Participants decide how to invest their "pre-tax" payroll contributions among the available fund choices. The ERS Board established a Roth contribution option in both the 401(k) and 457 Plans effective January 1, 2012. The Roth option allows employees to designate all or a portion of their monthly Texa$aver contribution as an "after-tax" contribution, in accordance with Section 402(a) of the Internal Revenue Code of 1986.

Program Funding. The Legislature does not appropriate funds for the administration of the Texa$aver Program. Currently, participants are charged a monthly asset-based fee to cover administrative expenses. Administrative fees for certain investment options are offset by quarterly fund reimbursements made directly into participant accounts through revenue sharing agreements that ERS has with most of the Texa$aver funds.

Program Participation and Enrollment

The Texa$aver Program has assets of $2.65 billion as of August 31, 2016. The 401(k) plan experienced a 9.51% increase in the number of participant accountsand plan assets experienced an increase of 8.09% over the last year. In comparison, the number of 457 plan accounts increased by 8.08% and the plan assets grew by 10.93%.

The following table features some of the key statistics of the Texa$aver Program.

Texa$aver Deferred Compensation Program As of August 31, 2016		
	401(k) Plan	**457 Plan**
Current assets	$1,984.7 million	$670.0 million
Participant balances		
Average	$10,950	$21,252
Median	689	2,214
Monthly Deferrals		
Average	$129	$238
Median	37	50
Total eligible to participate	151,866[1]	250,837[2]
Participants with a balance	181,249	31,515
Contributing	92,527 51%	17,052 54%
Non-contributing	88,722 49%	14,463 46%

1 Includes state employees only

2 Includes both state and higher education employees

Program Investment Performance and Product Options

The Texa$aver Program offers core choices in equities, fixed income and cash equivalent investments, which include mutual funds and collective trust funds. The Program also offers target date funds as its Qualified Default Investment Alternative ("QDIA"), and a self-directed brokerage account. The investment options in the 401(k) and 457 plans are the same. Texa$aver may add new investment options as needed to meet its objectives and provide participants with a well-diversified mix of funds. The Program's 12-month rate of return through August 31, 2016 was 7.23%.

Annual Review of Fees

ERS does not receive appropriated funds from the State of Texas for the administrative cost of the Texa$aver Program. Instead, costs are assessed to all participant accounts in the form of a monthly administrative fee. The administrative fees collected from participant accounts are structured to generate sufficient revenue to meet the recordkeeping and ERS internal costs associated with the administration of the program.

ERS stratifies administrative fees based on a participant's account balance. Fees are assessed to Texa$aver accounts separately on a monthly basis. This stratification structure considers the increase in the number of accounts due to enrollment and the assets held in the plans. Annually, ERS staff reviews the fee stratification tiers and proposes needed adjustments based on actual enrollment figures. The recommendation from ERS staff in the Underwriting Data Analysis and Reporting section of Benefit Contracts is to make no changes to fees for calendar year 2017.

PUBLIC AGENDA ITEM - #17a.

Review, Discussion and Consideration of the Texas Employees Group Benefits Program:

17a. Health Insurance Financial Status Update for Fiscal Year 2016 and Outlook for Fiscal Year 2017

December 2, 2016

Background:

Medical. The Texas Group Benefits Program (GBP) offers an array of health insurance programs to state employees, retirees, and their eligible dependents. The largest plan, HealthSelect of Texas℠ (HealthSelect), is the self-funded point of service health benefit plan with about 82% of GBP health plan participants enrolled. HealthSelect offers health coverage throughout Texas and the United States. Under a self-funded program, the plan administrator, in this case ERS, receives all of the contributions and uses those dollars to reimburse the third-party administrator (TPA) as claims are paid. The TPA receives payment for their administrative expenses only and does not profit from the amount of claims paid.

In addition to the self-insured HealthSelect plan, the GBP health coverage also provides fully-insured plans through Health Maintenance Organizations (HMOs), HealthSelect Medicare Advantage℠, a Medicare Advantage Preferred Provider Organization, and KelseyCare Advantage, a Medicare Advantage HMO.

Beginning September 1, 2016, the State offered an additional self-funded health plan, Consumer Directed HealthSelect. This plan had no impact on financial results for Fiscal Year 2016 (FY 2016).

Prescription Drug Benefits. All GBP health plans include prescription drug coverage, although the coverage is provided in different ways. HealthSelect Medicare Advantage and the Medicare Advantage HMO provide medical benefits only. Participants in those plans receive prescription drug benefits through HealthSelect Medicare Rx, which also provides self-funded prescription drug coverage for all Medicare-primary participants in HealthSelect.

Each HMO for non-Medicare employees provides health and prescription coverage. All HealthSelect participants receive benefits through the HealthSelect prescription drug program currently administered by Caremark. Program administration will transition to Optum Rx, an affiliate of UnitedHealthcare, on January 1, 2017.

Contributions. HealthSelect plan benefits are funded by contributions paid by the enrolled employees and retirees (members) and by the State of Texas and other participating employers through the biennial legislative appropriation and various sources of local funds. The state and participating employers currently pay 100% of the contributions for member coverage and 50% of contributions for dependent coverage. The ERS Board of Trustees sets the annual contribution rates based on the projected cost of coverage, member cost sharing, projected expenses, provider reimbursement arrangements, and available funding from the State of Texas.

As fully-insured plans, ERS pays premiums in exchange for a full transfer of risk to the third party vendor for the HMOs, HealthSelect Medicare Advantage and Medicare Advantage HMO plans. These plans can only be offered if they provide a lower cost alternative to the HealthSelect plan and, therefore these plans produce at least breakeven financial results to the GBP.

Therefore, any gain or loss under the GBP health plans are always attributable to experience under HealthSelect and HealthSelect Medicare Prescription drug programs which are self-funded.

Fiscal Year 2016, Review

During Fiscal Year 2016, total revenue for all health plans was $3,412.8 million and total expenditures were $3,354.4 million. The plan is estimated to have a net gain of $58.4 million for the year. As a result of favorable experience and cost saving measures adopted by ERS, the GBP should close out the fiscal year with $498.9 million in the contingency fund. By statute, ERS is required to hold funds to cover 60 days of HealthSelect claims. This amount is equal to $567 million for FY 2016.

The positive outcome in the contingency fund is credited to better than expected rebates based on prescription drug usage and Medicare Part D subsidies. These payments can stretch over many years. As more information on payments becomes available, consulting actuaries can adjust projections and in this case, increase amounts. The gains from rebate adjustments and subsidies are attributed to prior years that were greater than the accruals established at fiscal years' end.

HealthSelect. HealthSelect continued to see favorable experience in FY 2016. Medical trend for FY 2016 was 8.4%; consistent with previous years and internal expectations. Prescription drug trend remains high in FY 2016 at 10.9% for HealthSelect; however, this is still lower than the peaks seen in FY 2013 and 2014.

In conjunction with the HealthSelect TPA, ERS staff continues to work to identify and fill network gaps through the addition of key providers to the network. Overall network size has grown 20% since implementation in September 2012. The percentage of claims paid in-network (based on theallowable amount) has increased over the last year from 89.7% to 90.5%. For FY 2016, the difference between the billed amount and the allowed amount for covered services provided by out-of-network providers was about $366 million for claims paid through September 2016. While this amount represents the potential balance billing for FY2016, it is likely to significantly overstate the impact on HealthSelect participants as ERS cannot confirm the actual amount charged by out-of-network providers for any remaining expenses not covered by the plan.

Internal administrative expenses represent slightly less than 0.5% of total HealthSelect expenses. All administrative expenses (including external administrative fees) represent less than 3% of total HealthSelect costs.

In addition to financial measurement, ERS measures vendor performance in a number of ways as well. Fiscal Year 2016 saw a significant increase in the number of grievances managed at ERS. There were 403 grievances in FY 2016 (113 from members and 290 from providers), which represents an increase of 69% from FY 2015. The primary reason for the increase is the number of providers filing grievances on behalf of their patients. The ability for providers to appeal was included as part of the Affordable Care Act, and ERS has seen a corresponding increase in number of appeals following this legislation.

The overall satisfaction with the HealthSelect plan, as noted in the FY 2016 third quarter survey administered by the HealthSelect third-party administrator (TPA), currently UnitedHealthcare, dropped by 2.3% to a satisfaction rate of 83.9% from the same time period in FY 2015.

INITIATIVES TO REDUCE COSTS:

ERS understands that state government must conserve resources and streamline operations for maximum efficiencies. The current economy, state budgetary pressures and the additional cost arising from federal health care reform legislation make cost management more important than ever. ERS staff continues to explore options to reduce plan costs.

- During FY 2016,HealthSelect added new clinics to the Patient Centered Medical Home (PCMH) program. The program welcomed additional clinics in the Lubbock area as well as one coming soon in the Amarillo market. Savings attributable to all such arrangements during FY 2016 will be determined in January 2017.

- The dependent eligibility gap audit saved an estimated $8 million in FY 2016. The ongoing audit of dependents as they are added to the plan is projected to save a similar amount each year.

Outlook for Fiscal Year 2017

Consumer-Directed HealthSelect. The new high-deductible health plan with a Health Savings Account (HSA), became available to GBP participants per statute on September 1, 2016. Total enrollment was less than 700 for members and dependents for FY2017. Plan implementation involved the procurement of the health savings account administrator, determing plan design and contribution rates, and modifying ERS and employer systems to accommodate new payroll deductions and enrollment options. ERS expects slow growth in the program as the new design is unfamiliar to longtime state employees and the primary incentive for enrollment is tax savings.

HealthSelect. The ERS staff and consulting actuary expect the health plan benefit cost trend for FY 2017 to be 8.5%, consistent with what was seen in FY 2016. Offsetting costs is the new pharmacy contract effective January 1, 2017. In the last 8 months of the fiscal year, this change is expected to save the GBP approximately $100 million due to improved discounts and rebates.

In May 2016, the Board approved a 7.1% increase in the HealthSelect employer and member contribution rates for FY 2017. This increase is consistent with the legislative appropriation and allows for the continuation of the current level of benefits through FY 2017. The increased contribution rates are expected to largely offset increased costs resulting from the health plan benefit cost trend.

All Plans. The GBP is expected to generate a gain of about $94.7 million in FY 2017. The projected gain is expected to increase the contingency fund balance to about $593.6 million as of August 31, 2017.

GBP Health Plan Financial Status

GBP Summary of Actual and Projected Health Plan Experience

Based on experience through September 2016 ($Millions)

All Health Plans

	FY2015	FY2016	FY2017 Projected
REVENUE			
State Contribution for State Agencies	$1,653.1	$1,801.5	$1,948.1
State Contribution for Higher Education	706.9	773.7	836.7
State Contribution – Other	67.7	72.5	78.5
State Contribution - Total	2,427.7	2,647.7	2,863.3
Member Contributions	455.1	485.9	515.9
Other Revenue	219.9	279.2	367.5
TOTAL REVENUE	**$3,102.7**	**$3,412.8**	**$3,746.7**
HEALTH CARE EXPENDITURES	**$3,041.5**	**$3,354.4**	**$3,652.0**
Net Gain (Loss)	**$61.2**	**$58.4**	**$94.7**
FUND BALANCE	**$440.5**	**$498.9**	**$593.6**
Other Expenses Incurred Outside of the GBP Fund			
Member Cost Sharing	**$480.4**	**$486.6**	**$492.2**

STAFF RECOMMENDATION:

This agenda item is presented for discussion and informational purposes only. No action is necessary.

PUBLIC AGENDA ITEM - #17b.

Review and Discussion of the Texas Employees Group Benefits Program:

17b. GBP Medicare Plans and Monitoring Strategy Overview

December 2, 2016

Background

The Employees Retirement System of Texas ("ERS") contracts with providers to perform administrative services for the various programs offered within the Texas Employees Group Benefits Program (GBP). Each contract defines the services and deliverables that are to be performed in the administration of the applicable benefits program. As such, each contract sets forth conditions whereby the vendor's failure to meet the contractual requirements may result in performance guarantee assessment(s) and/or liquidated damages.

Certified Texas Contract Manager

Members of the account management team within the Benefit Contracts Division monitor the GBP vendors' adherence to the contractual requirements. . Each account management specialist is a Certified Texas Contract Manager (CTCM) as required by Texas Government Code, Section 2262.053 and the *State of Texas Procurement Manual*.[1] To be eligible for CTCM certification, the account manager must satisfy the following requirements: possess at least one year of contract management experience; complete the Contract Management segment courses administered by the Texas Procurement and Support Services ("TPASS") provided by the Texas Comptroller of Public Accounts ("CPA" or "Comptroller"); and pass a certification examination. Continuing education requirements are necessary to maintain the CTCM designation.

Contract Monitoring Strategy

Contract administration refers to the processes used to monitor vendor performance that occur after a contract is signed.[2] Performance monitoring of the GBP Vendors is a key aspect of the contract management responsibilities. The level and frequency of performance monitoring may vary based on the critical nature of the contract; however, the account manager follows a defined contract monitoring strategy developed for the GBP.

The overall strategy is organized on either a fiscal or calendar year basis, as appropriate, to align with the plan year of the benefit program. The key objectives of the contract monitoring strategy include, but are not limited to, the following:

- Review and report the GBP vendor's adherence in meeting the delivery points and maintaining acceptable customer service levels;
- Initiate and track recommendations identified through applicable strategic planning and contract monitoring activities;
- Review the methodology used by the GBP vendor in developing self-reported data reflected within the Monthly Administrative Performance Report; and
- Review key metrics including adherence to specified service level expectations and performance standards, as well as specific federally mandated requirements.

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[1] Texas State Comptroller of Public Accounts, *State of Texas Procurement Manual,* pg. 14. http://www.comptroller.texas.gov/procurement/pub/manual/ProcurementManual.pdf

[2] State of Texas Contract Management Guide, version 1.14, 01-Sep-2015, page 15. http://comptroller.texas.gov/procurement/pub/contractguide/contract-mgmt-guide-v1.14.pdf

Contract Monitoring: Plans for Medicare eligible retirees and dependents

Specific for Medicare-eligible retirees and their Medicare-eligible dependents, ERS offers two Medicare health options and one Medicare prescription drug plan (collectively "GBP Medicare") which are briefly described below.

- The HealthSelect Medicare Advantage plan is a statewide Medicare Advantage Preferred Provider Organization ("MA PPO") option that has been available since January 1, 2012. Under this plan, medical-only benefits are available for the enrolled Medicare-eligible population.
- A regional Medicare Advantage Maintenance Organization ("MA HMO") has been available in eight counties within the greater Houston area beginning September 1, 2011. Currently, the MA HMO provides medical-only benefits to the enrolled population.
- The HealthSelect Medicare Rx plan is an Employer Group Waiver Plan with a Wrap ("EGWP + Wrap") that serves as the designated prescription drug plan for the retired Medicare eligible population. An EGWP + Wrap program is an official Medicare Part D program containing a *wraparound* provision that ensures that retired employees will receive benefits at least equal to those of the traditional HealthSelect Prescription Drug Plan within the GBP. This plan has been available since September 1, 2014.

A summary of the plan features and enrollment associated with each GBP Medicare plan is provided in Exhibit A.

The account manager employs several tactics to accomplish the contract monitoring objectives described above. Some of these tactics include, but would not be limited to, the following:

- Conduct cross-divisional operational meetings;
- Facilitate strategic planning meetings;
- Identify potential issues and track results from the Monthly Administrative Performance Reports; plan performance reports, annual executive reports, and mediation tracking reports;
- Review source documentation reporting;
- Confirm compliance with provided directives; and
- Review findings from compliance audits.

The Monthly Administrative Performance Report is specific to the GBP contracts and is designed to be a comprehensive monitoring tool for the account manager.

Monitoring: Monthly Administrative Performance Report (MAPR)

The MAPR is a customized report specific to each of the GBP Medicare contracts. Since the MAPR reflects specific Contractual Agreement ("Contract") performance areas and includes all performance guarantee standards, it serves as a comprehensive monitoring tool for the account manager. Each of the GBP Medicare vendors reports their respective performance within each stipulated service or operational component within the program-specific MAPR.

- <u>HealthSelect Medicare Advantage PPO contract, Calendar Year (CY) 2015 period:</u>
  The MAPR captures 17 criteria[3] that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four major categories:
  - Account Management with 6 criteria;
  - Customer Service with 5 criteria;
  - Operations with 2 criteria; and
  - Systems and Data Management with 4 criteria.

[3] One (1) of the tracked activities reflected within the MAPR is a non-Performance Guarantee activity; any remedy necessary for non-performance related to this activity is reflected within the contract.

- Medicare Advantage HMO contract, CY2015 period:
  The MAPR captures 14 criteria[4] for this fully insured plan that focus around account management. These criteria are measured and reported on a monthly, quarterly, and/or annual basis.

- HealthSelect Medicare Rx contract, CY2015 period:
  The MAPR captures 24 criteria[5] that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four major categories:

  - Account Management with 5 criteria;
  - Customer Service with 7 criteria;
  - Operations with 6 criteria; and
  - Systems and Data Management with 6 criteria.

The GBP Medicare vendors are responsible for providing MAPRs and other contract deliverables according to timelines set forth within the Contract. A vendor's failure to meet any of the requirements stipulated within the Contract may result in a monetary assessment in the form of a performance assessment.

Monitoring: Performance Guarantees

The Performance Guarantees are established during the procurement process and specify the service expectations that the GBP vendor is to perform throughout the Contract period. The Performance Guarantee is an appendix to the Contract and is presented in two sections.

Section 1 provides the comprehensive listing of performance expectations with a description of the business-critical service functions the GBP vendor must perform. This section also provides the reporting frequency and the metrics for each listed business-critical service function.

Section 2 discloses the total dollar amount that the vendor has placed at risk to ensure its contract performance meets or exceeds the service level standards set forth within the Contract. The amount at risk is a function of the contact value. Assessments for any single plan year will not exceed the total amount placed at risk. The chart illustrates the four severity levels assigned to each business-critical service function listed in Section 1.

Level of Severity	Definition	Allocation of Amount at Risk
Severity 1 – Emergency	Mission critical systems are down; or, a substantial loss of service; or, business operations has been severely disrupted; or, a major milestone has not been met. In each situation, no work-around that is acceptable to ERS is immediately available.	50% of the aggregate annual amount at risk for each occurrence
Severity 2 – Critical	A major functionality is severely impaired. Operations can continue in a restricted fashion; however, client and/or member service(s) are adversely affected.	25% of aggregate annual amount at risk for each occurrence
Severity 3 – Moderate	Business operations have been adversely impaired in a moderate manner. A temporary work-around that is acceptable to ERS is immediately available.	• Occurrence 1 = 3% of aggregate annual amount at risk • Occurrence 2 =

[4] Six (6) of the tracked activities reflected within the MAPR for the MA HMO plan are non-Performance Guarantee activities; any remedy necessary for non-performance related to any one of these activities is reflected within the contract.

[5] One (1) of the tracked activities reflected within the MAPR for the HealthSelect Medicare Rx plan is a non-Performance Guarantee activity; any remedy necessary for non-performance related to this activity is reflected within the contract.

		5% of aggregate annual amount at risk • Occurrence 3 = 6% of aggregate annual amount at risk • Occurrence 4 = 9% of aggregate annual amount at risk
Severity 4 – Minor	Business operations have been adversely affected in a limited manner requiring a modification of current policies and/or processes.	2% of aggregate annual amount at risk for each occurrence

- The HealthSelect Medicare Advantage PPO contract for CY2015 contains 16 Performance Guarantee service functions:
    - Severity Level 1: 1 service functions
    - Severity Level 2: 2 service functions
    - Severity Level 3: 5 service functions
    - Severity Level 4: 8 service functions

- The Medicare Advantage HMO contract for CY2015 contains 8 Performance Guarantee[6] service functions:
    - Severity Level 1: 2 service functions
    - Severity Level 2: 6 service functions

- The HealthSelect Medicare Rx contract for CY2015 contains 22 Performance Guarantee service functions:
    - Severity Level 1: 2 service functions
    - Severity Level 2: 5 service functions
    - Severity Level 3: 5 service functions
    - Severity Level 4: 9 service functions
    - Specialized Level: 1 service function specific to data management.

Enhanced Performance Monitoring

Overall, the vendor performance monitoring of the GBP Medicare plans is comprehensive and reflects the value and importance of the vendor contracts for the GBP Medicare offerings. The monitoring performed for the HealthSelect Medicare Rx plan is completed with the intent to meet the enhanced performance monitoring specified with the passage of Senate Bill 20 of the 84th Legislative Session, and as required under Sec. 2261.253, Government Code.[7]

Exhibit A – GBP Medicare Plans Overview

This agenda item is presented for discussion purposed only. No action is required.

[6] The number of PGs disclosed excludes one (1) implementation-specific function.

[7] Nelson, Jane. S. B. 20, Legislative Session: 84(R), http://www.legis.state.tx.us/tlodocs/84R/billtext/doc/SB00020F.doc

GBP Medicare Plans Overview

HealthSelect Medicare Advantage, Medical Only

The GBP has offered a statewide Medicare Advantage Preferred Provider Organization (MA PPO) option, known as HealthSelect Medicare Advantage℠, since January 1, 2012. The plan provides medical benefits to Medicare eligible retirees and their Medicare eligible dependents. As a Medicare Advantage offering, the benefits provided under the plan are subject to the design and constraints set forth by the Centers for Medicare and Medicaid Services (CMS). The plan is insured by Humana Insurance Company (Humana) under a contract period from January 1, 2012 through December 31, 2017. Humana provides the medical-only coverage under a fully-insured arrangement. The prescription drug coverage is provided separately under the HealthSelect Medicare Rx plan.

To be eligible for the HealthSelect Medicare Advantage plan, participants must be eligible for primary coverage under Medicare Part A and Part B (Medicare-primary). The medical benefits provided under the HealthSelect Medicare Advantage plan are as comprehensive as the benefits provided under HealthSelect. Medicare-primary participants who are automatically enrolled into the HealthSelect Medicare Advantage plan at age 65, but they can choose to opt-out and enroll into their previous plan at any point during the year.

Program Enrollment. The HealthSelect Medicare Advantage plan continues to provide the most cost-effective medical benefits for Medicare-primary GBP participants for both the state and eligible members. Enrollment in the HealthSelect Medicare Advantage plan continues to grow as indicated in the enrollment chart below. Growth is primarily due to members "aging-in" to coverage, although members continue to voluntarily select the plan as they become more familiar with the plan's benefit coverage and lower contribution costs for covered dependents.

HealthSelect Medicare Advantage℠
Participant Enrollment
Plan Years 2012 – 2016

HealthSelect Medicare Advantage	**Enrollment** January 2012	**Enrollment** January 2013	**Enrollment** January 2014	**Enrollment** January 2015	**Enrollment** January 2016	**Enrollment*** August 2016
Members	37,953	38,186	42,469	46,258	50,529	52,564
Dependents	9,372	9,964	11,366	12,329	13,419	13,901
Total Participants	**47,325**	**48,150**	**53,835**	**58,587**	**63,948**	**66,465**

** Interim plan year reporting*

Medicare Advantage HMO, Medical Only

The GBP offered a Medicare Advantage Health Maintenance Organization ("MA HMO") beginning September 1, 2011. In return for a monthly premium, a MA HMO plan provides fully insured benefits to retirees and dependents that are eligible for primary coverage under Medicare Part A and Part B (Medicare-primary). Currently, ERS offers one MA HMO: KelseyCare Advantage (KelseyCare). KelseyCare provides MA HMO coverage in eight Houston-area counties. The initial contract term for the KelseyCare option began September 1, 2011 and will extend through December 31, 2017. The prescription drug coverage for MA HMO participants is provided separately under the HealthSelect Medicare Rx plan.

Similar to the HealthSelect Medicare Advantage, the benefits provided by KelseyCare for the MA HMO are subject to the design and constraints set forth by CMS. Similar to the HealthSelect Medicare Advantage plan, Medicare-primary participants who elect KelseyCare can choose to opt-out and enroll back into their previous GBP plan.

Program Enrollment. The MA HMO continues to provide the most cost-effective medical benefit for those Medicare-primary GBP participants within the Houston area. The enrollment within the MA HMO continues to grow as indicated in the enrollment chart.

KelseyCare Advantage MA HMO
Participant Enrollment
Plan Years 2012 – 2016

KelseyCare Advantage MA HMO *	Enrollment January 2012	Enrollment January 2013	Enrollment January 2014	Enrollment January 2015	Enrollment January 2016	Enrollment** August 2016
Members	465	736	832	942	1,025	1,083
Dependents	107	165	182	192	209	223
Total Participants	**572**	**901**	**1,014**	**1,134**	**1,234**	**1,306**

** Medical coverage only*
*** Interim plan year reporting*

HealthSelect Medicare Rx

The HealthSelect Medicare Rx serves as the prescription drug plan available to HealthSelect of Texas[SM] (Medicare-primary participants), HealthSelect Medicare Advantage PPO and Medicare Advantage HMO participants. The plan is an Employer Group Waiver Plan (EGWP) plus Wrap, administered by SilverScript Insurance Company (SilverScript). An EGWP plus Wrap is an official Medicare Part D program containing a *wraparound* provision that ensures that retired employees will receive benefits at least equal to those of the HealthSelect Prescription Drug Plan within the GBP. The initial contract period with SilverScript began on January 1, 2013 and will run through December 31, 2016.

During the May 17, 2016 Board meeting, the ERS Board of Trustees approved the selection of UnitedHealthcare as the pharmacy benefit manager of the HealthSelect Medicare Rx program beginning January 1, 2017. Initially the contract period will be for a six-year term, expiring on August 31, 2022.

Program Enrollment Since September 1, 2014, ERS requires Medicare-primary participants to automatically age into HealthSelect Medicare Rx as they turn age 65. Participants who became Medicare-primary prior to September 2014 were transitioned to the HealthSelect Medicare Rx on January 1, 2015. Enrollment within the HealthSelect Medicare Rx plan continues to grow.

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HealthSelect Medicare Rx
Participant Enrollment
Plan Years 2013 – 2016

HealthSelect Medicare Rx	**Enrollment** January 2013	**Enrollment** January 2014	**Enrollment** January 2015	**Enrollment** January 2016	**Enrollment*** August 2016
Total Participants	73,048	71,438	80,873	87,540	90,118

*** Interim plan year reporting*

PUBLIC AGENDA ITEM - #17c.

Review and Discussion of the Texas Employees Group Benefits Program:

17c. Dental Insurance Plans and Monitoring Strategy Overview

December 2, 2016

Background

The Employees Retirement System of Texas ("ERS") contracts with providers to perform administrative services for the various programs offered within the Texas Employees Group Benefits Program ("GBP"). Each contract defines the services and deliverables that are to be performed in the administration of the applicable benefit program. As such, each contract sets forth conditions whereby the vendor's failure to meet the contractual requirements may result in performance guarantee assessment(s) and/or liquidated damages.

Certified Texas Contract Manager
Members of the account management team within the Benefit Contracts division monitor the GBP vendors' adherence to the contractual requirements. Each account management specialist is required to be a Certified Texas Contract Manager ("CTCM") by Texas Government Code, Section 2262.053 and the *State of Texas Procurement Manual*.[1] To be eligible for CTCM certification, the account manager must satisfy the following requirements: possess at least one year of contract management experience; complete the Contract Management segment courses administered by the Texas Procurement and Support Services ("TPASS") provided by the Texas Comptroller of Public Accounts ("CPA" or "Comptroller") and pass a certification examination. Continuing education requirements are necessary to maintain the CTCM designation.

Contract Monitoring Strategy
Contract administration refers to the processes used to monitor vendor performance that occur after a contract is signed.[2] Performance monitoring of GBP vendors is a key aspect of contract management responsibilities. The level and frequency of performance monitoring may vary based on the critical nature of the contract. However, the account manager follows a defined contract monitoring strategy developed for the GBP.

Contract monitoring activities are organized on either a fiscal or calendar year basis, as appropriate, to align with the plan year of the benefit program. The key objectives of the contract monitoring strategy include:

- Reviewing and reporting adherence in meeting the delivery points and maintaining acceptable customer service levels;
- Initiating and tracking recommendations identified through formal compliance audits, strategic planning and contract monitoring activities;
- Reviewing the methodology the vendor used to report data specific to their contract in their Monthly Administrative Performance Report (MAPR),
- Reviewing key metrics including adherence to specified service level expectations and performance standards;

[1] Texas State Comptroller of Public Accounts, *State of Texas Procurement Manual,* pg. 14.
http://www.comptroller.texas.gov/procurement/pub/manual/ProcurementManual.pdf

[2] State of Texas Contract Management Guide, version 1.14, 01-Sep-2015, page 15.
http://comptroller.texas.gov/procurement/pub/contractguide/contract-mgmt-guide-v1.14.pdf

- Identifying opportunities to develop and deploy enhanced requirements (i.e. directives, strategic initiatives, plan design changes); and
- Coordinating the engagement of a vendor compliance audit by an independent auditing firm selected by ERS through a competitive procurement process.

Contract Monitoring: Dental Insurance Programs

The GBP offers two dental insurance programs: a self-funded Preferred Provider Organization ("PPO"), known as the State of Texas Dental Choice Plan℠ ("Dental Choice"); and a Dental Health Maintenance Organization ("DHMO") plan. Exhibit A provides an overview of the dental insurance plans, as well as the non-insurance discount dental option. The contract monitoring provided herein will be applicable to the dental insurance options.

Monitoring: Monthly Administrative Performance Report (MAPR)

The MAPR reflects specific Contractual Agreement ("Contract") performance areas and includes all performance guarantee standards. As such, the dental program vendors must report their performance within each stipulated service or operational component.

- Dental Choice Third Party Administrator (TPA) contract, Fiscal Year (FY) 2016 period:
  The MAPR captures 23 criteria that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four major categories:
  - Account Management with 7 criteria;
  - Customer Service with 5 criteria;
  - Operations with 5 criteria; and
  - Systems and Data Management with 6 criteria.

- Dental Health Maintenance Organization (DHMO) carrier contract, FY2016 period:
  The MAPR captures 19 criteria that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four major categories:
  - Account Management with 7 criteria;
  - Customer Service with 5 criteria;
  - Operations with 1 criterion; and
  - Systems and Data Management with 6 criteria.

Monitoring: Performance Guarantees

The Performance Guarantees specify the service expectations the GBP vendor is to perform throughout the contract period. The Performance Guarantee is an appendix to the Contract and is presented in two sections.

Section 1 provides the comprehensive listing of performance expectations with a description of the business-critical service functions to be performed by the GBP vendor. This section also provides the reporting frequency and the metrics for each listed business-critical service function.

Section 2 discloses the total dollar amount the vendor has placed at risk to ensure its contract performance meets or exceeds the service level standards. The amount at risk is a function of the contract value. Assessments for any single plan year will not exceed the total amount placed at risk. The chart illustrates four severity levels assigned to each business-critical service function listed in Section 1.

Level of Severity	Definition	Allocation of Amount at Risk
Severity 1 – Emergency	Mission critical systems are down; or a substantial loss of service; or business operations has been severely disrupted; or a major milestone has not been met. In each situation, no work-around that is acceptable to ERS is immediately available.	50% of the aggregate annual amount at risk for each occurrence
Severity 2 – Critical	A major functionality is severely impaired. Operations can continue in a restricted fashion; however, client and/or member service(s) are adversely affected.	25% of aggregate annual amount at risk for each occurrence
Severity 3 – Moderate	Business operations have been adversely impaired in a moderate manner. A temporary work-around that is acceptable to ERS is immediately available.	• Occurrence 1 = 3% of aggregate annual amount at risk • Occurrence 2 = 5% of aggregate annual amount at risk • Occurrence 3 = 6% of aggregate annual amount at risk • Occurrence 4 = 9% of aggregate annual amount at risk
Severity 4 – Minor	Business operations have been adversely affected in a limited manner requiring a modification of current policies and/or processes.	2% of aggregate annual amount at risk for each occurrence

- The Dental Choice administrator contract for FY2016 contains 22 Performance Guarantee service functions:
    - Severity Level 1: 2 service functions
    - Severity Level 2: 3 service functions
    - Severity Level 3: 9 service functions
    - Severity Level 4: 8 service functions
- The DHMO carrier contract for FY2016 contains 18 Performance Guarantee service functions:
    - Severity Level 1: 2 service functions
    - Severity Level 2: 3 service functions
    - Severity Level 3: 5 service functions
    - Severity Level 4: 8 service functions

Enhanced Performance Monitoring

Overall, the vendor performance monitoring of the dental insurance program is comprehensive and reflects the value and importance of the vendor contracts for the program. The monitoring performed for

the Dental Choice plan is completed with the intent to meet enhanced performance monitoring specified with the passage of Senate Bill 20 of the 84th Legislative Session, and as required under Sec. 2261.253, Government Code.[3]

This agenda item is presented for discussion purposes only. No action is required.

Exhibit A – Dental Program Overview

[3] Nelson, Jane. S. B. 20, Legislative Session: 84(R), http://www.legis.state.tx.us/tlodocs/84R/billtext/doc/SB00020F.doc

Dental Program Overview

The GBP offers three dental options for participants. Two of these offerings are insurance options: the State of Texas Dental Choice Plan[SM] a self-funded Preferred Provider Organization ("PPO"), and Humana Dental HMO, a fully insured Dental Health Maintenance Organization ("DHMO") plan. The third option is the State of Texas Dental Discount Plan[SM], a non-insurance dental discount program. The Board awarded the provider contracts on four year terms beginning September 1, 2014, and ending August 31, 2018 as follows:

- The third party administrator for the State of Texas Dental Choice Plan[SM] was awarded to HumanaDental Insurance Company;
- The carrier for the DHMO plan was awarded to DentiCare, Inc., a wholly owned subsidiary of Humana, Inc.; and
- The administrator of the non-insurance, dental discount plan was awarded to Careington International.

Program Enrollment

Overall, the enrollment within the dental options continues to grow at a rate just over 3% per year. Fiscal year 2017 enrollment for all three options is more than 445,000 participants. Despite a 10% increase in the contribution rate, enrollment in the State of Texas Dental Choice Plan increased 5%, while the Humana Dental HMO experienced a decrease in enrollment of 2.2%. The decreased enrollment was projected by ERS due to the introduction of the State of Texas Dental Discount Plan[SM]. Enrollment in the discount plan has increased 57.2% since its inception in Plan Year 2015.

Dental Plan Enrollment
September 1, 2012 to September 1, 2017

Dental Plan	Enrollment FY2012	Enrollment FY2013	Enrollment FY2014	Enrollment FY2015	Enrollment FY2016	Enrollment FY2017
State of Texas Dental Choice Plan[SM] (PPO)	246,734	258,502	271,645	281,031	295,401	310,203
DHMO	151,757	145,835	142,463	135,586	128,118	125,283
State of Texas Dental Discount Plan[SM] (non-insurance option)	N/A	N/A	N/A	6,627	9,300	10,418
Total	398,491	404,337	414,108	423,244	432,819	445,904

As represented in the chart above, enrollment in the State of Texas Dental Choice Plan increased 25.72% from FY2012 through FY2017; however, enrollment in the DHMO decreased 17.44% for the same period.

Network Management – Dental Choice

As the program administrator, HumanaDental focused on successfully offering an expanded provider network to Dental Choice participants. The HumanaDental Network provides member network access to 47 of the Top 50 dentists utilized by our participants and 94 of the Top 100 dentists.[1] As a result of ongoing recruitment of Dental Choice network providers, HumanaDental reports a 7.1% increase in unique general dentist facilities and a 13.3% increase in unique specialty facilities for September 2016, when compared to the same period last year. The expanded provider network has ultimately helped to keep participants within the network, which lowers both their out of pocket costs and the plan's costs.

Dental Choice Network Usage Comparisons
September 1, 2010 to September 1, 2016

Dental Choice	In-Network Usage	Out-of-Network Usage
FY2011	61%	39%
FY2012	64%	36%
FY2013	67%	33%
FY2014	66%	34%
FY2015	67%	33%
FY2016	67%	33%

Program Utilization

A comparison of Dental Choice utilization from FY2015 to FY2016 continues to show substantial utilization by participants. In addition to comparing the trends on a year-to-year basis, HumanaDental also benchmarks the plan's utilization against similar voluntary plans nationwide. The comparison of the Dental Choice plan to the national benchmarks is shown in the chart below.

Comparison of the Dental Choice Plan
To National Benchmarks

Procedure Types	FY 2015		FY 2016	
	Dental Choice PPO Utilization (per 1,000)	**Benchmark: Voluntary National Utilization** (per 1,000)	**Dental Choice PPO Utilization** (per 1,000)	**Benchmark: Voluntary National Utilization** (per 1,000)
Preventive	2,912	2,505	3,039	2,469
Basic	792	717	822	699
Major	230	145	231	144
Orthodontics	105	67	106	62
Other	9	3	9	3
Total	**4,048**	**3,437**	**4,207**	**3,377**

[1] Top dental providers are identified using HumanaDental claims data.

Insurance Plans Experience

The changes made to the Dental Choice plan design, expansion of the Dental Choice network, and restructuring contribution rates have allowed the plan to function on a financially sound basis. The fully-insured design and premium rate guarantees of the DHMO ensures that it will remain financially sound throughout the term of the contract. Administrative costs for the DHMO are included in the member contribution rates.

GBP Dental Plans Financial Status FY2016			
Dental Choice		**DHMO**	
Member Contributions	$ 79,156,489	**Member Contributions**	$ 13,838,797
Claims	$ 82,743,354	**Paid to DentiCare**	$ 13,917,575
Loss Ratio*	103.6%	**Loss Ratio***	n/a
Administration	$ 3,465,136	**Administration**	n/a

**Ratio of incurred claims to member contributions*

PUBLIC AGENDA ITEM- #17d

Review and Discussion of the Texas Employees Group Benefits Program:

17d. Basic and Optional Term Life, Accidental Death and Dismemberment Plans and Monitoring Strategy Overview

December 2, 2016

Background

The Employees Retirement System of Texas ("ERS") contracts with providers to perform administrative services for the various programs offered within the Group Benefits Program ("GBP"). Each contract defines the services and deliverables that are to be performed in the administration of the applicable benefit program. As such, each contract sets forth conditions whereby the vendor's failure to meet the contractual requirements may result in performance guarantee assessment(s) and/or liquidated damages.

Certified Texas Contract Manager

Monitoring the GBP vendors' adherence to the contractual requirements is performed by members of the account management team within the Benefit Contracts Division. Each account management specialist is required to undergo training to be designated as a Certified Texas Contract Manager ("CTCM") as required by Texas Government Code, Section 2262.053 and the *State of Texas Procurement Manual*.[1] To be eligible for CTCM certification, the account manager must satisfy the following requirements: possess at least one year of contract management experience; complete the Contract Management segment courses administered by the Texas Procurement and Support Services ("TPASS") provided by the Texas Comptroller of Public Accounts ("CPA" or "Comptroller"); and pass a certification examination. Continuing education requirements are necessary to maintain the CTCM designation.

Contract Monitoring Strategy

The scope of contract administration refers to the processes that occur after a contract is signed[2] and includes methods used to monitor vendor performance. Therefore, performance monitoring of the GBP Vendors is a key aspect of the contract management responsibilities. The level and frequency of performance monitoring may vary based on the criticality of the contract. However, the account manager follows a defined contract monitoring strategy developed for the GBP.

The overall strategy is comprised of several contract monitoring activities and is organized on either a fiscal or calendar year basis, as appropriate, to align with the plan year of the benefit program. The key objectives of the contract monitoring strategy include, but not limited to, the following:

- Review and report the GBP vendor's adherence in meeting the delivery points and maintaining acceptable customer service levels;
- Initiate and track recommendations identified through formal compliance audits, strategic planning and contract monitoring activities;
- Review the methodology used by the GBP vendor in developing self-reported data reflected within the Monthly Administrative Performance Report;

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[1] Texas State Comptroller of Public Accounts, *State of Texas Procurement Manual,* pg. 14. http://www.comptroller.texas.gov/procurement/pub/manual/ProcurementManual.pdf

[2] State of Texas Contract Management Guide, version 1.14, 01-Sep-2015, page 15. http://comptroller.texas.gov/procurement/pub/contractguide/contract-mgmt-guide-v1.14.pdf

- Review key metrics including adherence to specified service level expectations and performance standards;
- Identify opportunities to develop and deploy enhanced requirements (i.e. directives, strategic initiatives, plan design changes); and
- Coordinate the engagement of a compliance audit of the vendor by an independent auditing firm selected by ERS through a competitive procurement process.

Contract Monitoring: Life Plans

The Texas Employees Group Benefits Program ("GBP") offers Basic and Optional Term Life, Accidental Death and Dismemberment ("AD&D") and Voluntary AD&D insurance. The employer provides funding for the Basic Term Life plan; the other plans are optional and are solely funded by the program participants. The ERS Board of Trustees ("Board") awarded the administration of these plans ("GBP Life and AD&D Plans") to Minnesota Life Insurance Company for a contract period beginning January 1, 2012 through August 31, 2016. A two year contract extension was executed for the contract period beginning September 1, 2016 through August 31, 2018. An overview of the GBP Life and AD&D Plans is provided within Exhibit A.

The Account Management team, within the Benefit Contracts Division, is responsible for monitoring vendors for contractual compliance. The Account Manager is responsible for ensuring that contractual performance is documented and that ERS management is informed in a timely manner regarding potential/actual compliance issues. Each vendor is responsible for providing reports tailored to the program. These reports are used by the Account Manager to monitor compliance, as well as regular operational meetings. The vendor must also provide a quarterly executive review regarding performance of the plan, operational actions, and updates on strategic actions. Each of these contracts defines the services, products and other deliverables due to ERS, GBP and Program members. The contracts set forth conditions whereby the vendor's failure to meet the contractual requirements may result in the assessment of performance guarantee fees or liquidated damages.

Monitoring: Monthly Administrative Performance Report (MAPR)

The MAPR is a customized tool that is specific to the applicable GBP Program. The report reflects specific Contractual Agreement ("Contract") performance areas and includes all performance guarantee standards. As such, the GBP Life and AD&D Plans vendor must report its performance within each stipulated service or operational component.

- <u>Minnesota Life Insurance Company contract, Fiscal Year (FY) 2016 period:</u>
  The MAPR captures 22 criteria[3] that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four major categories:

  - Account Management with 15 criteria;
  - Customer Service with 1 criteria;
  - Operations with 2 criteria; and
  - Systems and Data Management with 4 criteria.

The GBP vendor is responsible for providing MAPRs and other contract deliverables according to timelines set forth in the contract. The vendor's failure to meet any of the requirements stipulated in the contract may result in a monetary assessment in the form of a performance assessment.

[3] The MAPR count disclosed excludes three (3) implementation PG activities which became obsolete following the January 1, 2012 go-live implementation with Minnesota Life Insurance Company.

Monitoring: Performance Guarantees

The Performance Guarantees are formulated during the procurement process and specify the service expectations that the GBP vendor is to perform throughout the Contract period. The Performance Guarantee is an appendix to the contract and is presented in two sections.

Section 1 provides the comprehensive listing of performance expectations with a description of the business-critical service functions to be performed by the GBP vendor. This section also provides the reporting frequency and the metrics for each listed business-critical service function.

Section 2 discloses the total dollar amount that the vendor has placed at risk ("amount at risk") to ensure its contract performance meets or exceeds the service level standards set forth within the contract. The amount at risk is a function of the contract value. Assessments for any single plan year will not exceed the total amount placed at risk. This section is illustrative of the 4 severity levels assigned to each business-critical service function listed in the table below.

Level of Severity	Definition	Allocation of Amount at Risk
Severity 1 – Emergency	Mission critical systems are down; or a substantial loss of service; or business operations has been severely disrupted; or a major milestone has not been met. In each situation, no work-around that is acceptable to ERS is immediately available.	50% of the aggregate annual amount at risk for each occurrence
Severity 2 – Critical	A major functionality is severely impaired. Operations can continue in a restricted fashion; however, client and/or member service(s) are adversely affected.	25% of aggregate annual amount at risk for each occurrence
Severity 3 – Moderate	Business operations have been adversely impaired in a moderate manner. A temporary work-around that is acceptable to ERS is immediately available.	• Occurrence 1 = 3% of aggregate annual amount at risk • Occurrence 2 = 5% of aggregate annual amount at risk • Occurrence 3 = 6% of aggregate annual amount at risk • Occurrence 4 = 9% of aggregate annual amount at risk
Severity 4 – Minor	Business operations have been adversely affected in a limited manner requiring a modification of current policies and/or processes.	2% of aggregate annual amount at risk for each occurrence

- The Minnesota Life Insurance Company TPA contract for FY2016 contains 22 Performance Guarantee[4] service functions:
    - Severity Level 1: 1 service function
    - Severity Level 2: 4 service functions
    - Severity Level 3: 5 service functions
    - Severity Level 4: 12 service functions

This agenda item is presented for discussion purposes only. No action is required.

ATTACHMENT - 1

Exhibit A – Basic and Optional Term Life, AD&D Plans Overview

[4] The PG count disclosed excludes three (3) implementation PG activities which became obsolete following the January 1, 2012 go-live implementation with Minnesota Life Insurance Company.

Basic and Optional Term Life, AD&D Plans Overview

The Texas Employees Group Benefits Program (GBP) offers Basic and Optional Term Life, Accidental Death and Dismemberment (AD&D) and Voluntary AD&D insurance. All plans are funded solely by the program's participants with the exception of Basic Life, which is funded by the State of Texas. The ERS Board of Trustees (Board) awarded the contract to Minnesota Life Insurance Company effective January 1, 2012 through August 31, 2016. A two year contract extension was executed for the contract period beginning September 1, 2016 through August 31, 2018. The coverage options available for actives and retirees are provided below.

Basic Group Term Life Insurance with AD&D coverage

- *Actives*: Participating employees who elect GBP health coverage are automatically enrolled in $5,000 Basic Group Term Life Insurance and $5,000 Basic AD&D coverage.

- *Retirees*: Each participating retired employee in the GBP is automatically enrolled in $2,500 Basic Group Term Life Insurance. AD&D coverage is not available to retired employees.

Optional Group Term Life Insurance with Basic AD&D coverage

- *Actives*: The amount of Optional Group Term Life Insurance and AD&D coverage is based on the employee's salary. When newly hired, an employee may apply for Optional Term Life Insurance at one or two times annual salary without Evidence of Insurability (EOI). An election of Optional Term Life Insurance at three or four times annual salary requires EOI. The combined amount of Optional Group Term Life Insurance may not exceed $400,000 with a corresponding amount of AD&D coverage.

- *Retirees*: Optional Group Term Life Insurance is available to retirees. However, specific rules governing the maximum amounts available are dependent on date of retirement. Beginning at age 70, Optional Term Life coverage is reduced for both active and retired employees based on age:

Age 70-74	65%
Age 75-79	40%
Age 80-84	25%
Age 85-89	15%
Age 90 and over	10%

Dependent Term Life Insurance coverage with AD&D coverage

- *Actives*: Each participating employee may purchase $5,000 of Dependent Group Term Life Insurance and $5,000 of AD&D for each listed eligible dependent.

- *Retirees*: Each participating retired employee may retain $2,500 of Dependent Group Term Life Insurance if held as an active employee. The AD&D coverage is not available for dependents of retired employees.

Voluntary AD&D coverage

- *Actives*: Voluntary Accidental Death and Dismemberment is a separate insurance program. Voluntary AD&D, sometimes referred to as Voluntary Accident Insurance (VAI), is offered to employees for an additional premium unrelated to the Group Term Life Insurance premium. An employee is not required to carry Optional Group Term Life Insurance coverage in order to carry Voluntary AD&D coverage and no EOI is required for Voluntary AD&D. The amount of Voluntary AD&D coverage is a maximum of $200,000, but available in lesser incremental amounts.

- *Retirees*: Not available to retirees.

Program Enrollment

The GBP Life and AD&D Insurance Plans remain popular among GBP participants. The following table lists enrollment and the current cumulative values of benefits for the plans as of August 31, 2016.

GBP Life/AD&D Insurance Enrollment
August 31, 2016

Coverage	Plan Type	Funding	No. of Members	Cumulative Value of Benefits ($)
Life	Basic Life	Fully Insured	321,737	$ 1,346,652,500
Life	Optional Life & AD&D	Fully Insured	214,454	20,343,858,700
Life	Voluntary AD&D	Fully Insured	133,454	18,502,521,250
Life	Dependent Life & AD&D	Fully Insured	111,598	486,000,000

PUBLIC AGENDA ITEM - #17e

Review and Discussion of the Texas Employees Group Benefits Program:

17e. Group Vision Care Program and Monitoring Strategy Overview

December 2, 2016

Background

The Employees Retirement System of Texas ("ERS") contracts with providers to perform administrative services for the various programs offered within the Group Benefits Program ("GBP"). Each contract defines the services and deliverables that are to be performed in the administration of the applicable benefit program. As such, each contract sets forth conditions whereby the vendor's failure to meet the contractual requirements may result in performance guarantee assessment(s) and/or liquidated damages.

Certified Texas Contract Manager
Monitoring the GBP vendors' adherence to the contractual requirements is performed by members of the account management team within the Benefit Contracts Division. Each account management specialist is required to undergo training to be designated as a Certified Texas Contract Manager (CTCM) as required by Texas Government Code, Section 2262.053 and the *State of Texas Procurement Manual*.[1] To be eligible for CTCM certification, the account manager must satisfy the following requirements: possess at least one year of contract management experience; complete the Contract Management segment courses administered by the Texas Procurement and Support Services ("TPASS") provided by the Texas Comptroller of Public Accounts ("CPA" or "Comptroller"). Continuing education requirements are necessary to maintain the CTCM designation.

Contract Monitoring Strategy
The scope of contract administration refers to the processes that occur after a contract is signed[2] and includes methods used to monitor vendor performance. Therefore, performance monitoring of the GBP vendors is a key aspect of the contract management responsibilities. The level and frequency of performance monitoring may vary based on the criticality of the contract; however, the account manager follows a defined contract monitoring strategy developed for the GBP.

The overall strategy is comprised of several contract monitoring activities and is organized on either a fiscal or calendar year basis, as appropriate, to align with the plan year of the benefit program. The key objectives of the contract monitoring strategy include, but not limited to, the following:

- Review and report the GBP vendor's adherence in meeting the delivery points and maintaining acceptable customer service levels;
- Initiate and track recommendations identified through formal compliance audits, strategic planning and contract monitoring activities;
- Review the methodology used by the GBP vendor in developing self-reported data reflected within the Monthly Administrative Performance Report;
- Review key metrics including adherence to specified service level expectations and performance standards;
- Identify opportunities to develop and deploy enhanced requirements (i.e. directives, strategic initiatives, plan design changes); and

[1] Texas State Comptroller of Public Accounts, *State of Texas Procurement Manual,* pg. 14.
http://www.comptroller.texas.gov/procurement/pub/manual/ProcurementManual.pdf

[2] State of Texas Contract Management Guide, version 1.14, 01-Sep-2015, page 15.
http://comptroller.texas.gov/procurement/pub/contractguide/contract-mgmt-guide-v1.14.pdf

- Coordinate the engagement of a compliance audit of the vendor by an independent auditing firm selected by ERS through a competitive procurement process.

Contract Monitoring: Group Vision Care

Beginning September 1, 2016, the GBP began offering a self-funded vision plan to all employees, retirees and their eligible dependents. The contract monitoring provided herein will be applicable to the group vision care program.

The account manager employs several tactics to accomplish the contract monitoring objectives described above. Some of these tactics include, but would not be limited to, the following:

- Conduct cross-divisional operational meetings;
- Facilitate strategic planning meetings;
- Identify potential issues and track results from the Monthly Administrative Performance Reports; plan performance reports, annual executive reports, and mediation tracking reports;
- Review source documentation reporting;
- Confirm compliance with provided directives; and
- Review findings from compliance audits.

The Monthly Administrative Performance Report is specific to the GBP contracts and is designed to be a comprehensive monitoring tool for the account manager.

Monitoring: Monthly Administrative Performance Report (MAPR)

The MAPR is a customized tool that is specific to the applicable GBP Program. The report reflects specific Contractual Agreement ("Contract") performance areas and includes all performance guarantee standards. As such, the State of Texas Vision vendor must report their performance within each stipulated service or operational component.

- <u>Group Vision Care Services Third Party Administrator (TPA) contract, Fiscal Year (FY) 2017 period:</u>
  The MAPR captures twenty (20) criteria that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four (4) major categories:
  - Account Management with 6 criteria;
  - Customer Service with 5 criteria;
  - Operations with 4 criteria; and
  - Systems and Data Management with 5 criteria.

The GBP vendor is responsible for providing MAPRs and other contract deliverables according to timelines set forth within the Contract. The vendor's failure to meet any of the requirements stipulated within the Contract may result in a monetary assessment in the form a performance assessment.

Monitoring: Performance Guarantees

The Performance Guarantees are formulated during the procurement process and specify the service expectations that the GBP vendor is to perform throughout the Contract period. The Performance Guarantee is an appendix to the Contract and is presented into two sections.

Section 1 provides the comprehensive listing of performance expectations with a description of the business-critical service functions to be performed by the GBP vendor. This section also provides the reporting frequency and the metrics for each listed business-critical service function.

Section 2 discloses the total dollar amount that the vendor has placed at risk ("amount at risk") to ensure its contract performance meets or exceeds the service level standards set forth within the Contract. The

amount at risk is a function of the contract value. Assessments for any single plan year will not exceed the total amount placed at risk. This section is illustrative of the four (4) severity levels assigned to each business-critical service function listed in the table below.

Level of Severity	Definition	Allocation of Amount at Risk
Severity 1 – Emergency	Mission critical systems are down; or a substantial loss of service; or business operations has been severely disrupted; or a major milestone has not been met. In each situation, no work-around that is acceptable to ERS is immediately available.	50% of the aggregate annual amount at risk for each occurrence
Severity 2 – Critical	A major functionality is severely impaired. Operations can continue in a restricted fashion; however, client and/or member service(s) are adversely affected.	25% of aggregate annual amount at risk for each occurrence
Severity 3 – Moderate	Business operations have been adversely impaired in a moderate manner. A temporary work-around that is acceptable to ERS is immediately available.	• Occurrence 1 = 3% of aggregate annual amount at risk • Occurrence 2 = 5% of aggregate annual amount at risk • Occurrence 3 = 6% of aggregate annual amount at risk • Occurrence 4 = 9% of aggregate annual amount at risk
Severity 4 – Minor	Business operations have been adversely affected in a limited manner requiring a modification of current policies and/or processes.	2% of aggregate annual amount at risk for each occurrence

- The State of Texas Vision provider contract for FY2017 contains 20 Performance Guarantee service functions:
    - Severity Level 1: 2 service functions
    - Severity Level 2: 3 service functions
    - Severity Level 3: 7 service functions
    - Severity Level 4: 8 service functions

This agenda item is presented for discussion purposes only. No action is required.

ATTACHMENT - 1

Exhibit A – Group Vision Care Services Program Overview

Vision Program Overview

On May 17, 2016, the ERS Board of Trustees selected Superior Vision Services, Inc. ("Superior") as the third-party administrator of State of Texas Vision Plan. This new vision plan has been available to all employees, retirees and their eligible dependents since September 1, 2016.

The State of Texas Vision Plan is a self-funded plan. The Board awarded the provider a contract on a four year term beginning September 1, 2016 through August 31, 2020.

Program Enrollment

Overall, the State of Texas Vision Plan has been well received by participants. As of September 1, 2016, there were over 117,000 participants enrolled. This enrollment is approximately 17.9% of the eligible total. ERS staff anticipates the plan's enrollment to increase with the benefit being offered to the Medicare eligible retiree population whose enrollment period is scheduled for October 31, 2016 through November 18, 2016.

State of Texas Vision Plan
Participant Enrollment
As of September 1, 2016

State of Texas Vision Plan	Enrollment FY2017	Total Eligible	% Enrolled
Members	62,556	344,822	18.1%
Dependents	54,569	309,781	17.6%
Total Participants	**117,125**	**654,603**	**17.9%**

Network Management – State of Texas Vision

As the third party administrator, Superior has focused on successfully offering an expanded provider network to State of Texas Vision participants. Superior's national network provides member access to 46 of the top 50 optical retail chains across the country. There are over 6,800 in-network providers in Texas and over 68,000 in-network providers including optometrists, ophthalmologists and opticians across the country. As a result of ongoing recruitment of State of Texas Vision providers, Superior reports 40 additional in-network providers, nominated by participants. Additionally, they have other providers in various stages of the recruitment and contracting process. Eight of these providers are in underserved areas.

PUBLIC AGENDA ITEM - #17f

Review and Discussion of the Texas Employees Group Benefits Program:

17f. Disability Plans and Monitoring Strategy Overview

December 2, 2016

Background

The Employees Retirement System of Texas ("ERS") contracts with providers to perform administrative services for the various programs offered within the Group Benefits Program ("GBP"). Each contract defines the services and deliverables that are to be performed in the administration of the applicable benefit program. As such, each contract sets forth conditions whereby the vendor's failure to meet the contractual requirements may result in performance guarantee assessment(s) and/or liquidated damages.

Certified Texas Contract Manager
Monitoring the GBP vendors' adherence to the contractual requirements is performed by members of the account management team within the Benefit Contracts Division. Each account management specialist is required to undergo training to be designated as a Certified Texas Contract Manager ("CTCM") as required by Texas Government Code, Section 2262.053 and the *State of Texas Procurement Manual*.[1] To be eligible for CTCM certification, the account manager must satisfy the following requirements: possess at least one year of contract management experience; complete the Contract Management segment courses administered by the Texas Procurement and Support Services ("TPASS") provided by the Texas Comptroller of Public Accounts ("CPA" or "Comptroller"). Continuing education requirements are necessary to maintain the CTCM designation.

Contract Monitoring Strategy
The scope of contract administration refers to the processes that occur after a contract is signed[2] and includes methods used to monitor vendor performance. Therefore, performance monitoring of the GBP vendors is a key aspect of the contract management responsibilities. The level and frequency of performance monitoring may vary based on the criticality of the contract; however, the account manager follows a defined contract monitoring strategy developed for the GBP.

The overall strategy is comprised of several contract monitoring activities and is organized on either a fiscal or calendar year basis, as appropriate, to align with the plan year of the benefit program. The key objectives of the contract monitoring strategy include, but not limited to, the following:

- Review and report the GBP vendor's adherence in meeting the delivery points and maintaining acceptable customer service levels;
- Initiate and track recommendations identified through formal compliance audits, strategic planning and contract monitoring activities;
- Review the methodology used by the GBP vendor in developing self-reported data reflected within the Monthly Administrative Performance Report;
- Review key metrics including adherence to specified service level expectations and performance standards;
- Identify opportunities to develop and deploy enhanced requirements (i.e. directives, strategic initiatives, plan design changes); and

[1] Texas State Comptroller of Public Accounts, *State of Texas Procurement Manual,* pg. 14.
http://www.comptroller.texas.gov/procurement/pub/manual/ProcurementManual.pdf

[2] State of Texas Contract Management Guide, version 1.14, 01-Sep-2015, page 15.
http://comptroller.texas.gov/procurement/pub/contractguide/contract-mgmt-guide-v1.14.pdf

- Coordinate the engagement of a compliance audit of the vendor by an independent auditing firm selected by ERS through a competitive procurement process.

Contract Monitoring: Disability Plans

The Texas Income Protection Plan ("TIPP") is a self-funded optional insurance coverage for short-term disability and long-term disability offered through the GBP. TIPP is available to active employees. A summary of the TIPP program is provided in Exhibit A.

The account manager employs several tactics to accomplish the contract monitoring objectives described above. Some of these tactics include, but would not be limited to, the following:

- Conduct cross-divisional operational meetings;
- Facilitate strategic planning meetings;
- Identify potential issues and track results from the Monthly Administrative Performance Reports; plan performance reports, annual executive reports, and mediation tracking reports;
- Review source documentation reporting;
- Confirm compliance with provided directives; and
- Review findings from compliance audits.

The Monthly Administrative Performance Report is specific to the GBP contracts and is designed to be a comprehensive monitoring tool for the account manager.

Monitoring: Monthly Administrative Performance Report (MAPR)

The MAPR is a customized tool that is specific to the applicable GBP Program. The report reflects specific Contractual Agreement ("Contract") performance areas and includes all performance guarantee standards. As such, the TIPP vendor must report their performance within each stipulated service or operational component.

- <u>TIPP Third Party Administrator (TPA) contract, Fiscal Year (FY) 2016 period</u>
  The MAPR captures twenty-two (22) criteria[3] that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four (4) major categories:
  - Account Management with 5 criteria;
  - Customer Service with 6 criteria;
  - Operations with 5 criteria; and
  - Systems and Data Management with 6 criteria.

The TIPP TPA vendor is responsible for providing MAPRs and other contract deliverables according to timelines set forth within the Contract. The vendor's failure to meet any of the requirements stipulated within the Contract may result in a monetary assessment in the form a performance assessment.

Monitoring: Performance Guarantees

The Performance Guarantees are formulated during the procurement process and specify the service expectations that the GBP vendor is to perform throughout the Contract period. The Performance Guarantee is an appendix to the Contract and is presented into two sections.

Section 1 provides the comprehensive listing of performance expectations with a description of the business-critical service functions to be performed by the GBP vendor. This section also provides the reporting frequency and the metrics for each listed business-critical service function.

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[3] Seven (7) of the tracked activities reflected within the MAPR are non-Performance Guarantee activities; remedies for non-performance related to any of these activities are reflected within the contract.

Section 2 discloses the total dollar amount that the vendor has placed at risk ("amount at risk") to ensure its contract performance meets or exceeds the service level standards set forth within the Contract. The amount at risk is a function of the contract value. Assessments for any single plan year will not exceed the total amount placed at risk. This section is illustrative of the four (4) severity levels assigned to each business-critical service function listed in the table below.

Level of Severity	Definition	Allocation of Amount at Risk
Severity 1 – Emergency	Mission critical systems are down; or a substantial loss of service; or business operations has been severely disrupted; or a major milestone has not been met. In each situation, no work-around that is acceptable to ERS is immediately available.	50% of the aggregate annual amount at risk for each occurrence
Severity 2 – Critical	A major functionality is severely impaired. Operations can continue in a restricted fashion; however, client and/or member service(s) are adversely affected.	25% of aggregate annual amount at risk for each occurrence
Severity 3 – Moderate	Business operations have been adversely impaired in a moderate manner. A temporary work-around that is acceptable to ERS is immediately available.	• Occurrence 1 = 3% of aggregate annual amount at risk • Occurrence 2 = 5% of aggregate annual amount at risk • Occurrence 3 = 6% of aggregate annual amount at risk • Occurrence 4 = 9% of aggregate annual amount at risk
Severity 4 – Minor	Business operations have been adversely affected in a limited manner requiring a modification of current policies and/or processes.	2% of aggregate annual amount at risk for each occurrence

- The TIPP TPA contract for FY2016 contains 14 Performance Guarantee service functions:
    - Severity Level 1: 1 service function
    - Severity Level 2: 3 service functions
    - Severity Level 3: 5 service functions
    - Severity Level 4: 5 service functions

This agenda item is presented for discussion purposed only. No action is required.

ATTACHMENT -1

Exhibit A – Texas Income Protection Plan ("TIPP") Overview

Texas Income Protection Plan ("TIPP") Overview

The Texas Employees Group Benefits Program ("GBP") offers an optional insurance coverage for short-term disability and long-term disability. These types of coverage can increase an employee's financial security and assist an employee or his or her family through a period without the employee's salary income. The disability plans within the Texas Income Protection Plan ("TIPP") are self-insured plans funded solely by the plan's participants.

In February 2013, the Board of Trustees of the Employees Retirement System of Texas approved the selection of Aon Hewitt Absence Management, LLC ("Aon Hewitt") as the TIPP Third Party Administrator ("TPA"). The initial contract period was a four-year term beginning September 1, 2013 through August 31, 2017. As of December 31, 2015, Reed Group, Ltd., a wholly owned subsidiary of The Guardian Life Insurance Company of America®, acquired the absence management administration business of Aon Hewitt and rebranded the firm as Reed Group Management, LLC.

Program Enrollment

The following table lists enrollment and the current cumulative values of benefits for the disability plans as of August 31, 2016. Overall, enrollment within the TIPP plan continues to remain stable year after year with nominal fluctuations in enrollment and covered payroll figures.

TIPP
Enrollment and Covered Payroll
Fiscal Years 2016 – 2017

TIPP*	Short Term Disability			Long Term Disability		
	Enrollment FY2016	Enrollment FY2017	% Change	Enrollment FY2016	Enrollment FY2017	% Change
Members	117,488	115,836	-1.41%	90,529	89,260	-1.40%
Covered Payroll	$458,731,873	$462,125,607	0.74%	$376,627,172	$379,427,567	0.74%

**The GBP retains the risk under the self-funded plans.*

PUBLIC AGENDA ITEM - #18

18. Review and Discussion of the Texas Employees Group Benefits Program: TexFlex Program and Monitoring Strategy Overview

December 2, 2016

Background

The Employees Retirement System of Texas ("ERS") contracts with providers to perform administrative services for the various programs offered within the Group Benefits Program ("GBP"). Each contract defines the services and deliverables that are to be performed in the administration of the applicable benefit program. As such, each contract sets forth conditions whereby the vendor's failure to meet the contractual requirements may result in performance guarantee assessment(s) and/or liquidated damages.

Certified Texas Contract Manager
Monitoring the GBP vendors' adherence to the contractual requirements is performed by members of the account management team within the Benefit Contracts Division. Each account management specialist is required to undergo training to be designated as a Certified Texas Contract Manager ("CTCM") as required by Texas Government Code, Section 2262.053 and the *State of Texas Procurement Manual*.[1] To be eligible for CTCM certification, the account manager must satisfy the following requirements: possess at least one year of contract management experience; complete the Contract Management segment courses administered by the Texas Procurement and Support Services ("TPASS") provided by the Texas Comptroller of Public Accounts ("CPA" or "Comptroller"); and pass a certification examination. Continuing education requirements are necessary to maintain the CTCM designation.

Contract Monitoring Strategy
The scope of contract administration refers to the processes that occur after a contract is signed[2] and includes methods used to monitor vendor performance. Therefore, performance monitoring of the GBP Vendors is a key aspect of the contract management responsibilities. The level and frequency of performance monitoring may vary based on the criticality of the contract. However, the account manager follows a defined contract monitoring strategy developed for the GBP.

The overall strategy is comprised of several contract monitoring activities and is organized on either a fiscal or calendar year basis, as appropriate, to align with the plan year of the benefit program. The key objectives of the contract monitoring strategy include, but not limited to, the following:

- Review and report the GBP vendor's adherence in meeting the delivery points and maintaining acceptable customer service levels;
- Initiate and track recommendations identified through formal compliance audits, strategic planning and contract monitoring activities;
- Review the methodology used by the GBP vendor in developing self-reported data reflected within the Monthly Administrative Performance Report;
- Review key metrics including adherence to specified service level expectations and performance standards;
- Identify opportunities to develop and deploy enhanced requirements (i.e. directives, strategic initiatives, plan design changes); and
- Coordinate the engagement of a compliance audit of the vendor by an independent auditing firm selected by ERS through a competitive procurement process.

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[1] Texas State Comptroller of Public Accounts, *State of Texas Procurement Manual,* pg. 14.
http://www.comptroller.texas.gov/procurement/pub/manual/ProcurementManual.pdf

[2] State of Texas Contract Management Guide, version 1.14, 01-Sep-2015, page 15.
http://comptroller.texas.gov/procurement/pub/contractguide/contract-mgmt-guide-v1.14.pdf

Contract Monitoring: TexFlex Program

Under the GBP, ERS provides the State of Texas Employees Flexible Benefit Program ("TexFlex") to active employees as a means to help budget for health and day care expenses. As a flexible spending arrangement ("FSA"), the TexFlex plan is a form of a cafeteria plan benefit that is funded by pre-tax salary contributions used to reimburse participants for expenses incurred on certain qualified benefits. An overview of the TexFlex program is provided in Exhibit A.

The account manager employs several tactics to accomplish the contract monitoring objectives described above. Some of these tactics include, but would not be limited to, the following:

- Conduct cross-divisional operational meetings;
- Facilitate strategic planning meetings;
- Identify potential issues and track results from the Monthly Administrative Performance Reports; plan performance reports, annual executive reports, and mediation tracking reports;
- Review source documentation reporting;
- Confirm compliance with provided directives; and
- Review findings from compliance audits.

The Monthly Administrative Performance Report is specific to the GBP contracts and is designed to be a comprehensive monitoring tool for the account manager.

Monitoring: Monthly Administrative Performance Report (MAPR)

The MAPR is a customized tool that is specific to the applicable GBP Program. The report reflects specific Contractual Agreement ("Contract") performance areas and includes all performance guarantee standards. As such, the TexFlex vendor must report their performance within each stipulated service or operational component.

- <u>TexFlex Third Party Administrator (TPA) contract, Fiscal Year (FY) 2016 period:</u>
  The MAPR captures 22 criteria[3] that are measured and reported on a monthly, quarterly, and/or annual basis. These criteria are organized into four major categories:
  - Account Management with 7 criteria;
  - Customer Service with 5 criteria;
  - Operations with 4 criteria; and
  - Systems and Data Management with 6 criteria.

Monitoring: Performance Guarantees

The Performance Guarantees are formulated during the procurement process and specify the service expectations the GBP vendor is to perform throughout the contract period. The Performance Guarantee is an appendix to the contract and is presented in two sections.

Section 1 provides the comprehensive listing of performance expectations with a description of the business-critical service functions to be performed by the GBP vendor. This section also provides the reporting frequency and the metrics for each listed business-critical service function.

Section 2 discloses the total dollar amount the vendor has placed at risk ("amount at risk") to ensure its contract performance meets or exceeds the service level standards set forth within the contract. The amount at risk is a function of the contract value. Assessments for any single plan year will not exceed the total amount placed at risk.

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[3] One (1) of the tracked activities reflected within the MAPR is a non-Performance Guarantee activity; any remedy necessary for non-performance related to this activity is reflected within the contract.

This section is illustrative of the four severity levels assigned to each business-critical service function listed in Section 1 as reflected below:

Level of Severity	Definition	Allocation of Amount at Risk
Severity 1 – Emergency	Mission critical systems are down; or a substantial loss of service; or business operations have been severely disrupted; or a major milestone has not been met. In each situation, no work-around that is acceptable to ERS is immediately available.	50% of the aggregate annual amount at risk for each occurrence
Severity 2 – Critical	A major functionality is severely impaired. Operations can continue in a restricted fashion; however, client and/or member service(s) are adversely affected.	25% of aggregate annual amount at risk for each occurrence
Severity 3 – Moderate	Business operations have been adversely impaired in a moderate manner. A temporary work-around that is acceptable to ERS is immediately available.	• Occurrence 1 = 3% of aggregate annual amount at risk • Occurrence 2 = 5% of aggregate annual amount at risk • Occurrence 3 = 6% of aggregate annual amount at risk • Occurrence 4 = 9% of aggregate annual amount at risk
Severity 4 – Minor	Business operations have been adversely affected in a limited manner requiring a modification of current policies and/or processes.	2% of aggregate annual amount at risk for each occurrence

- The TexFlex TPA contract for FY2016 contains 15 Performance Guarantee service functions:
    - Severity Level 1: 2 service functions
    - Severity Level 2: 1 service functions
    - Severity Level 3: 4 service functions
    - Severity Level 4: 8 service functions

This agenda item is presented for discussion purposes only. No action is required.

ATTACHMENT - 1

Exhibit A – TexFlex Program Overview

Exhibit A

TexFlex Program Overview

Under the GBP, ERS provides the TexFlex program to active employees as a means to help budget and pay for health and day care expenses. As a Flexible Spending Account ("FSA") program, TexFlex is a form of cafeteria plan that is funded by pre-tax salary contributions. These contributions are used to reimburse participants for expenses incurred on certain qualified benefits. The TexFlex program is comprised of health care reimbursement plans, a dependent care reimbursement plan, and a commuter reimbursement plan. A summary of the various plans is provided below; the participant enrollment and contributions under each reimbursement plan will be addressed separately.

- The **health care reimbursement plan** is a plan under the Internal Revenue Code ("the Code") §125, adopted by the Board of Trustees of the Employees Retirement System of Texas ("ERS Board" or "Board"), and designed to provide payment or reimbursement for eligible health care expense. The maximum tax-deferred contribution amount is determined by the Internal Revenue Service ("IRS") and is currently set at $2,550 annually.

- The **limited purpose health care reimbursement plan** is provided under §125 of the Code. The ERS Board adopted this plan which is designed to provide payment or reimbursement for participants' eligible dental and vision expenses. By plan design, the limited purpose plan is only available to employees enrolled in the Consumer Directed HealthSelect℠ Plan. The maximum tax-deferred contribution amount is determined by the IRS and is currently set at $2,550 annually.

- The **dependent care reimbursement plan**, also governed under §125 of the Code, was adopted by the Board and designed to provide payment or reimbursement for dependent care expenses. The maximum tax-deferred contribution amount is determined by the IRS and is currently set at $5,000 annually per household.

- The **commuter reimbursement plan** is a plan governed under §132 of the Code and is commonly referred to as a Qualified Transportation Fringe Benefit ("QTFB"). The ERS Board adopted this plan which is designed to provide payment or reimbursement to participants for qualified expenses associated with their daily commute to and from work. This plan's limits are set by the IRS at a *monthly* benefit level of $255 for the parking benefit and $255 for a transit benefit.

TexFlex Contract

The contract with PayFlex, Inc. expired on August 31, 2015. In February of 2015, the TexFlex contract was awarded to ADP, LLC ("ADP") to cover a four-year term beginning September 1, 2015 through August 31, 2019. ADP is the program administrator for all of the reimbursement plans under the TexFlex Program.

TexFlex Program Fees

In previous years, the direct per employee cost of participation was nominal at $1.00 per account per month. For plan year 2016, the ERS Board approved an administrative fee holiday and the $1.00 fee was waived for program participants. The cost of administration for the TexFlex program is covered by the previous year's forfeited account balances.

Beginning in Plan Year 2016, TexFlex participants have access to a TexFlex branded debit card at no additional cost. In prior years the administrator charged an annual convenience fee of $15.00 to each participant who elected the debit card feature.

Pre-tax payments, or "premium conversion," are automatic for state employees enrolling in TexFlex, health, dental and/or life coverage under the Texas Employees Group Benefits Plan. The TexFlex and the premium conversion programs generated approximately $42 million in FICA tax savings to the state of Texas in Fiscal Year 2016. State employees realized even greater savings through reductions in their federal taxable income.

§125 Reimbursement Plans

- **TexFlex Health Care Reimbursement Plan**
  Under the TexFlex health care reimbursement plan, the pre-taxed member contributions are credited into a participant-specific account, herein called health care reimbursement account ("HCRA"), and maintained by the plan administrator. A participant is then able to use the contributions from his/her specific HCRA to fund health care expenses not covered by insurance such as prescription copays, dental expenses, eyeglasses/Lasik/contacts, medical supplies, and some over-the-counter ("OTC") products when prescribed by a doctor. The entire annual contribution is available to the participant at the beginning of each fiscal year.

  Due to requirements enacted by the Affordable Care Act ("ACA"), effective September 1, 2013, the maximum annual contribution limit for health care FSA accounts was reduced from $5,000 to $2,500. It has since increased to $2,550 effective September 1, 2015.

- **TexFlex Limited Purpose Health Care Reimbursement Plan**
  With the adoption of the High Deductible Heath Plan and Health Savings Account ("HSA"), ERS was tasked with implementing a limited purpose reimbursement plan, commonly referred to as a limited flexible savings account ("LFSA") to remain compliant with applicable IRS regulations. This account type is only available to participants enrolled in the Consumer Directed HealthSelect ("CDHS") plan.

  Under the TexFlex LFSA, the pre-taxed member contributions are credited into a participant-specific account, and maintained by the plan administrator. A participant is then able to use the contributions from his/her specific LFSA to fund only vision and dental expenses not covered by CDHS or reimbursed under the HSA. Eligible expenses include vision and dental copays and eyeglasses/Lasik/contacts. The entire annual contribution is available to the participant at the beginning of each fiscal year.

- **TexFlex Dependent Care Reimbursement Plan**
  The TexFlex dependent care reimbursement plan provides a participant with the means to contribute pre-tax dollars into a participant-specific account, herein called dependent care reimbursement account ("DCRA") that is maintained by the plan administrator. A participant is then able to use the contributions from his/her specific DCRA for day care expense for qualifying adults or children under the age of 13. The maximum annual contribution limit for TexFlex DCRA has remained unchanged from previous years at $5,000.

§125 Plan Enrollment and Elections

Participation in the TexFlex FSA program is voluntary with enrollment available during the annual enrollment period. Employees can also enroll or make changes to a TexFlex account within 31 days of being hired or experiencing a qualifying life event. Additionally, the program offers a passive re-enrollment process where participants are automatically re-enrolled at the same contribution amount as the previous plan year, unless they take action to opt out or change their monthly contribution amount.

The following table provides a year-over-year comparison of the enrollment numbers and pledged contribution elections into the TexFlex program.

TexFlex Program
§125 Reimbursement Plans
Participant Enrollment and Elections
Fiscal Years 2016 - 2017

§125 TexFlex Program	Health Care Reimbursement Plan			Dependent Care Reimbursement Plan		
	Enrollment FY2016	Enrollment FY2017	% Change	Enrollment FY2016	Enrollment FY2017	% Change
Members	46,877	50,031	6.73%	3,640	3,785	3.98%
Elections*	$65,658,055	$65,151,516**	-0.77%	$14,796,849	14,305,860**	-3.32%

** Elections are pledges into the program and are reported commitments for the applicable fiscal year.*

*** Annual enrollment elections for FY2017 are annualized based on September 2017 payroll data.*

TexFlex Program Forfeitures

One important consideration in using the TexFlex program concerns forfeitures. Any contributed funds in excess of the $500 carry-over for the HCRA that are not used by the end of the plan year or by the end of the DCRA grace period are forfeited to the TexFlex Program. Forfeited funds are applied to future plan administrative costs and are no longer available for use by the program participant. This forfeiture feature is characteristic of a §125 cafeteria plan and is commonly referred to as the "use it or lose it" rule.

The total accumulated forfeitures since the plan's inception is $11,507,874 with $2,675,903 accrued in Fiscal Year 2015. This is a decrease of approximately $5.1 million from Plan Year 14. With the change to the $500 carry-over that went into effect on September 1, 2014, ERS staff anticipates a reduction in the amount of forfeitures for Plan Year 16. Forfeiture amounts for Plan Year 16 funds will be calculated in April 2017 to allow for residual claims exceptions following the conclusion of the run-out period.

§132 Reimbursement Plans

In March of 2016, ERS expanded the optional benefits available to active participants with the implementation of the TexFlex Commuter Spending Account ("CSA"). The TexFlex CSA offers two account types whereby employees can use pre-tax dollars to pay for qualified expenses associated with their daily commute to and from work. The reimbursement benefits are administered independently, as allowed by the IRS, and are categorized as follows.

- **Qualified Parking Benefit Account**
  The monthly limit for qualified parking reimbursement is $255. The parking account allows reimbursement of eligible parking expenses incurred while commuting to and from work. Participants make monthly pre-tax contributions and can either use their TexFlex branded debit card at point of sale or opt to submit paper claims for reimbursement. Participants can carry over any unused amount from month-to-month and incur a monthly fee of $3.00 while carrying an active balance.

- **Qualified Transit Benefit Account**
  The monthly limit for qualified transit reimbursement is $255. The transit account allows for reimbursement of eligible mass transit and vanpool expenses incurred while commuting to and from work. Participants make monthly pre-tax contributions and can only use the TexFlex branded debit card at point of sale to access pre-tax funds. Participants can carry over any unused amount from month-to-month and incur a monthly fee of $3.00 while carrying an active balance.

The monthly administrative fee is charged per month per participant. This means that if a participant utilizes the qualified parking and qualified transit accounts then the participant is assessed $3.00 for the month.

§132 Plan Enrollment and Elections

Since inception in March of 2016, the qualified parking and qualified transit accounts available under the TexFlex CSA Program have seen low participation across the eligible population as indicated in the table below.

TexFlex Program
§132 Reimbursement Plans
Participant Enrollment and Elections
FY2016 YTD

§132 TexFlex CSA Program	March 2016	April 2016	May 2016	June 2016	July 2016	August 2016
Parking	11	9	12	17	14	11
Transit	131	126	128	128	127	131
Total Participants	**142**	**135**	**140**	**145**	**141**	**142**

§132 Plan Fee Overview

ERS generates 10 cents in revenue from the monthly fee paid by the participant. The administration payment per participant is $2.90 monthly.

TexFlex Program
Parking Reimbursement Plan
Fee Amounts

Parking Benefit Plan	April 2016	May 2016	June 2016	July 2016	August 2016
Carrier Administrative Fee Amount	$ 31.90	$ 26.10	$ 29.00	$ 49.30	$ 40.60
ERS Revenue Fee Amount	1.10	0.90	1.10	1.70	1.40
Member Fees	$ 33.00	$ 27.00	$ 30.10	$ 51.00	$ 42.00

TexFlex Program
Transit Reimbursement Plan
Fee Amounts

Transit Benefit Plan	April 2016	May 2016	June 2016	July 2016	August 2016
Carrier Administrative Fee Amount	$ 379.90	$ 365.40	$ 365.40	$ 371.20	$ 368.30
ERS Revenue Fee Amount	13.10	12.60	12.60	12.80	12.70
Member Fees	$ 393.00	$ 378.00	$ 378.00	$ 384.00	$ 381.00

PUBLIC AGENDA ITEM - #19

Review, Discussion and Consideration of the Texas Employees Group Benefits Program: Actuarial Valuation of Retiree Health Insurance Benefits as of August 31, 2016

December 2, 2016

BACKGROUND:

In accordance with Chapter 2264, Texas Government Code, Rudd and Wisdom, Inc., consulting actuary for the Texas Employees Group Benefit Program (GBP), conducted an actuarial valuation of state and higher education retiree insurance benefits, also known as other post-employment benefits (OPEB) for the fiscal year ending August 31, 2016 (FY 2016).

The valuation was performed in accordance with the financial reporting standards for state governmental plans established by the Governmental Accounting Standards Board (GASB) Statement Number 43. The work was based on the Texas Comptroller's determination that the GBP is a cost-sharing multiple-employer plan that meets the following criteria under GASB No. 43:

a) Employer contributions to the plan are irrevocable,

b) Plan assets are dedicated to providing benefits to participating retirees and their beneficiaries in accordance with the terms of the plan, and

c) Plan assets are legally protected from creditors of the employer or the plan administrator.

Funding for insurance benefits provided under the GBP is determined every two years and is paid for through member and employer contributions. The coverage offered through the GBP is not a constitutionally guaranteed benefit and neither the state nor ERS is required to maintain funds to pay future benefits.

GASB No. 43 requires that a plan's financial statements disclose the Annual Required Contribution (ARC), which is equal to the plan's Normal Cost, plus the amount necessary to amortize the Unfunded Actuarial Accrued Liability over a period that does not exceed 30 years. Despite the apparent implications of the term ARC, the participating employers are not required to contribute the ARC to the plan each year; instead, GASB No. 43 requires that the plan's financial statements include a schedule that compares the ARC with the actual employer contributions for each year.

Summary of Valuation Methodologies and Assumptions – For purposes of the FY 2016 OPEB valuation, Rudd and Wisdom has used the entry age normal cost method which is the same as that used in valuing the ERS retirement plan. The entry age normal cost method was also used for purposes of the FY 2015 OPEB valuation.

Where appropriate, Rudd and Wisdom uses the same demographic and economic assumptions adopted by the ERS and Teacher Retirement System (TRS) Boards for purposes of conducting their respective retirement plan valuations. Because most of the employees and retirees covered by the GBP are also covered by either ERS or TRS, use of their respective assumptions allows for consistency. Rudd and Wisdom also incorporates into the OPEB valuation the long-term inflation assumption adopted by ERS for purposes of the retirement plan

valuation. Rudd and Wisdom revises the demographic and economic assumptions used in the OPEB valuation each time new assumptions are adopted by the ERS or TRS Boards.

Certain aspects of the OPEB valuation process require use of assumptions that are unique to OPEB; specifically, assumptions concerning the investment return and the health benefit cost trend. These two important assumptions were developed as described below:

> **Investment Return** – The amount that the participating employers contribute to the health plan each year is limited to the cost of providing the benefits incurred during that year. As a result, the GBP does not accumulate funds. Under GASB No. 43, for plans that have no plan assets, the investment return assumption must be based upon the expected yield of the "assets of the employer." For the State of Texas, the "assets of the employer" are considered to be the assets held in the State Treasury Pool and managed by the Comptroller of Public Accounts. Based upon the investment policy of the Treasury Pool, the historical returns of the Treasury Pool, and the long-term inflation assumption adopted by ERS for purposes of the retirement plan valuation, Rudd and Wisdom has utilized an investment return assumption of 5.5%.
>
> **Health Benefit Cost Trend** – The health benefit cost trend represents the expected annual rate of increase in health benefit costs, excluding the effects of changes in demographics and changes in plan provisions. The health benefit cost trend has exceeded the general rate of inflation for many decades. Although this pattern is expected to continue for the foreseeable future, many economists anticipate that the degree to which the health benefit cost trend exceeds general inflation will eventually abate. These economists believe that the health benefit cost trend will reach an ultimate level that still exceeds general inflation, but not by as wide a margin as in the past decade. Rudd and Wisdom, Inc. has utilized a health benefit cost trend assumption that begins with short-term expectations of expected health benefit cost increases and gradually declines to 5.5%, a rate that exceeds the long-term inflation assumption adopted by ERS for purposes of the retirement plan valuation by 2.0%.

In summary, Rudd and Wisdom has used the same actuarial assumptions that were used in the FY 2015 OPEB valuation, with the following exceptions:

- The following assumptions have been updated since the previous valuation to reflect recent plan experience and expected trends:
  - Percentage of current retirees and their spouses not yet eligible to participate in the HealthSelect Medicare Advantage Plan and future retirees and their spouses who will elect to participate in the plan at the earliest date at which coverage can commence.
  - Proportion of future retirees covering dependent children.
  - Percentage of future retirees and retiree spouses assumed to use tobacco.
- Assumptions for Administrative Expenses, Assumed Per Capita Health Benefit Costs and Health Benefit Cost and Retiree Contribution trends have been updated since the previous valuation to reflect recent health plan experience and its effects on our short-term expectations.

Summary of Valuation Results – The results of the GBP OPEB actuarial valuation for fiscal year 2016 are summarized in the following tables:

	Members	Covered Spouses	Covered Dependent Children	Total
Actives	235,108[1]	41,564[2]	126,597[2]	403,269[2]
Deferred Vesteds	11,329	0[2]	0[2]	11,329[2]
Retirees and Nominees	113,430[3]	29,153	9,757	152,340
Total	**359,867**	**70,717**	**136,354**	**566,938**

[1] Includes return-to-work retirees and employees who have not yet satisfied the waiting period.
[2] Rather than use current spouse/dependent child coverage information, actuarial assumptions are used to estimate the future number of spouses and dependent children that will be covered at retirement.
[3] Includes 3,968 retirees who receive the Opt-Out Credit in lieu of health benefits

$ Millions

Actuarial Valuation Date	Unfunded Actuarial Accrued Liability	Normal Cost	Amortization	Annual Required Contribution
August 31, 2016	$27,091	$1,123	$1,176	$2,299
August 31, 2015	$25,741	$1,044	$1,117	$2,161
Change	$1,350	$79	$59	$138

The total employer contributions for FY 2016 were $666 million. In FY 2016, the employer contributions equaled 29.0% of the ARC.

The certified results of the GBP's FY 2016 OPEB valuation will be included in ERS FY 2016 Comprehensive Annual Financial Report and submitted to the Texas Comptroller for use in preparation of the FY 2016 State of Texas Comprehensive Annual Report.

New Accounting Standard - In June of 2015, the Governmental Accounting Standards Board adopted GASB No. 74 – *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans* that will replace GASB No. 43 effective for FY 2017 for GBP OPEB.

GASB No. 74 may require a number of significant accounting changes dependent upon certain criteria. The primary changes may include:

- **Investment Return**: For unfunded plans like the GBP OPEB, the investment return assumption will be based on yields of 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher. The expected investment return assumption for FY 2017 is likely to be lower than the current investment return assumption, depending on the assumptions used for the yields of these tax-exempt bonds. A lower investment return assumption will result in an increase in the liabilities that will be reported.

- **Notes to Financial Statement and Required Supplementary Information (RSI)**: OPEB expense and liability information is currently shown in the Notes to the Financial Statement and the RSI. GASB 74 may require significant changes in presentation of the OPEB expense and liability information.

There may also be increased note disclosures and supplementary information which include a sensitivity analysis of the Net OPEB Liability to ±1% changes in the investment return assumption and ±1% changes in the healthcare trend rate.

STAFF RECOMMENDATION:

The ERS staff recommends the Board of Trustees accept the actuarial valuation of retiree health benefits under the GBP, presented with this agenda item under separate cover, and adopt the proposed motion included with this agenda item.

ATTACHMENT – 1

Exhibit A – Actuarial Valuation of Other Post-Employment Benefits Provided Under the Texas Employees Group Benefits Program for the Fiscal Year Ending August 31, 2016, Rudd and Wisdom, Inc. *(Included under separate cover)*

ERS
Employees Retirement System of Texas

Employees Retirement System of Texas

Actuarial Valuation of Other Post-Employment Benefits Provided Under the Texas Employees Group Benefits Program

Governmental Accounting Standards Board Statement No. 43 for the Fiscal Year Ending August 31, 2016

Rudd and Wisdom, Inc.
CONSULTING ACTUARIES

Rudd and Wisdom, Inc.

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November 4, 2016

Board of Trustees
Employees Retirement System of Texas
1801 Brazos
Austin, Texas 78701

Attached is our Actuarial Valuation of the Other Post-Employment Benefits (OPEB) provided under the Texas Employees Group Benefits Program (GBP) administered by the Employees Retirement System of Texas (ERS) for the Fiscal Year ending August 31, 2016 (GBP OPEB). The purpose of this valuation is to provide accounting information that is required by the Governmental Accounting Standards Board Statement No. 43 (GASB No. 43) which sets forth the financial reporting standards for plans of state and local governments that provide post-employment benefits other than pension benefits. Such benefits are referred to collectively as OPEB. The results of this valuation are appropriate only for purposes of GASB No. 43.

The GBP provides OPEB for retired employees of the State of Texas and certain institutions of higher education and other agencies as specified in Chapter 1551 of the Texas Insurance Code. For purposes of this report, the participating employers are referred to collectively as the Employer.

GASB No. 43 and GASB No. 45 operate together to form the basis of financial reporting for OPEB by the plan (GASB No. 43) and by the employer/plan sponsor (GASB No. 45). Depending upon plan structure, GASB presents several alternatives for coordinated plan and employer/sponsor reporting.

The Office of the Comptroller of Public Accounts (CPA) has determined that the GBP is a cost-sharing multiple employer plan that is administered in accordance with paragraph 4 of GASB No. 43 which applies to trusts, or equivalent arrangements, that meet the following criteria:

a) Employer contributions to the plan are irrevocable,

b) Plan assets are dedicated to providing benefits to their retirees and their beneficiaries in accordance with the terms of the plan, and

c) Plan assets are legally protected from creditors of the employer or the plan administrator.

Therefore, based on the determination of the CPA, ERS reports under paragraphs 16 through 40 of GASB No. 43 and references to GASB No. 43 should be interpreted accordingly.

Please refer to the glossary in Section IX of this report for the definitions of certain GASB No. 43 terms which are indicated below in boldface type the first time they appear.

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Disclosures Required to be Included with the Plan's Financial Statements

Under GASB No. 43 the plan financial statements must disclose the **Annual Required Contribution (ARC)** which is equal to the plan's **Normal Cost** plus an amount to amortize the **Unfunded Actuarial Accrued Liability** over a period that does not exceed 30 years.

Despite the apparent implications of the term ARC, the Employer is not *required* to contribute the ARC to the plan each year; instead, if the Employer contributes an amount less than the ARC, this fact is disclosed as Required Supplementary Information, as described below.

The ARC provides a basis for evaluating whether the employer's contributions for OPEB are adequate to fund the benefits during the working lifetime of current employees (i.e., the Normal Cost) and to amortize existing unfunded obligations (i.e., the obligations for current retirees plus that portion of the current employees' obligations that are attributed to past service) in a systematic manner over the amortization period prescribed by GASB. Per GASB No. 43, the following information is to be disclosed as Required Supplementary Information under the "Schedule of Funding Progress" as shown on page V-1 of this report.

The ARC for the fiscal year ending August 31, 2016 is $2.299 billion. Employer contributions for the period totaled $666 million. Therefore, Employer contributions were equal to about 29% of the ARC.

Consistency with Assumptions Used for Retirement Plan Valuations

Most of the employees and retirees covered by the GBP are also covered by either the ERS or Teacher Retirement System (TRS) retirement plans that are subject to periodic actuarial valuations. Where appropriate, for purposes of this report, we have utilized assumptions previously adopted by the ERS and TRS Boards for use in performing the retirement plan valuations. However, certain aspects of the OPEB valuation process require the use of assumptions that are unique to OPEB; specifically, the investment return assumption and the health benefit cost trend as discussed below.

Changes in Actuarial Assumptions

Since the last valuation was prepared for this plan, assumed Expenses, assumed Per Capita Health Benefit Costs and assumed Health Benefit Cost and Retiree Contribution Trends have been updated to reflect recent experience and its effects on our short-term expectations. In addition, the percentage of future retirees electing to participate in the HealthSelect Medicare Advantage program at the earliest date at which coverage can commence, the proportion of future retirees covering dependent children and the percentage of future retirees and retiree spouses assumed to use tobacco have been updated to reflect recent plan experience and expected trends.

For a complete list of assumptions, see Section VII of this report.

Investment Return Assumption (Discount Rate)

In accordance with GASB No. 43, the investment return assumption (discount rate) is the estimated long-term investment yield on investments expected to be used to finance the payment of benefits with consideration given to the nature and mix of current and expected investments. For this purpose, the investments expected to be used to finance the benefits are:

(i) the plan assets, if the employer's funding policy is to contribute an amount at least equal to the ARC,

(ii) assets of the employer, for plans that have no plan assets, or

(iii) a combination of (i) and (ii), for plans being partially funded.

Presently, the amount that the Employer contributes to the plan each year is equal to the expected cost of providing the benefits incurred during that year. This amount is determined on a pay-as-you-go basis (PAYGO) and does not accumulate funds in advance of retirement as ARC-level contributions would. Therefore, the PAYGO amount is significantly less than the ARC. As a result of this funding policy and because the plan has no material level of assets held under a different investment policy that would materially affect the determination of the discount rate, under GASB No. 43 the investment return assumption must be based upon the expected yield of the "assets of the employer," as indicated in Item (ii) above. For the State of Texas, the "assets of the employer" are the assets held in the State Treasury Pool and managed by the Comptroller of Public Accounts.

Based upon the investment policy of the Treasury Pool, the historical returns of the Treasury Pool, and the long-term inflation assumption used in this report, we have utilized an investment return assumption (discount rate) of 5.50%.

If a policy was implemented to consistently fund the ARC or a significant portion thereof, the discount rate discussed above could be higher than the current 5.50% assumption if the underlying investments of the plan assets were expected to yield a return in excess of 5.50%. This higher discount rate would produce a smaller ARC.

Health Benefit Cost Trend

For purposes of this valuation, the health benefit cost trend represents the expected annual rate of increase in health benefit costs, excluding the effects of changes in demographics and changes in plan provisions.

The health benefit cost trend has exceeded the rate of price increases in the general economy, as measured by changes in the Consumer Price Index (CPI), for many decades. Although this pattern is expected to continue for the foreseeable future, many economists anticipate that the degree to which the health benefit cost trend exceeds general inflation will eventually abate. These economists believe that the health benefit cost trend will reach an ultimate level that still exceeds general inflation, but not by as wide a margin as in past decades.

The health benefit cost trend assumption used in this report begins with our short term expectations of expected health benefit cost increases in the next year and gradually declines to a rate that exceeds the assumed rate of general price inflation by 2.0%.

Changes in Plan Provisions

Under Q/A #49 of GASB's Guide to Implementation of GASB Statements 43 and 45 on Other Postemployment Benefits, any plan changes that have been adopted and communicated to plan members by the time the valuation is prepared must be included in the valuation. Accordingly, this valuation reflects the benefit changes that became effective September 1, 2016 (except as noted below), since these changes were communicated to plan members in advance of the preparation of this report. The benefit changes for retirees for whom Medicare is not primary include: (a) an increase in the overall annual out-of-pocket maximum in accordance with the requirements of the Affordable Care Act (ACA) (effective January 1, 2017) and (b) implementation of (i) a program under which HealthSelect participants can consult with a licensed physician from their mobile device and (ii) an online weight loss program available to eligible HealthSelect participants not enrolled in Medicare Part B. These minor benefit changes have been reflected in the FY 2017 Assumed Per Capita Health Benefit Costs. In addition, effective September 1, 2016, retirees for whom Medicare is not primary may elect to participate in Consumer Directed HealthSelect, a high-deductible health plan and a health savings account, in lieu of HealthSelect. Retiree participation in Consumer Directed HealthSelect is expected to be minimal. There are no benefit changes for Medicare Primary retirees. Also, effective September 1, 2016, all employees, retirees and their dependents may elect to participate in the State of Texas Vision plan. This plan is self-funded through contributions made by employees and retirees. The State does not contribute towards vision coverage.

For a complete description of the benefit provisions, see Section VIII of this report.

High-Cost Plan Excise Tax

Consistent with the prior valuation, the effects of the High-Cost Plan Excise Tax imposed by the ACA under Internal Revenue Code Section 4980I (sometimes referred to as the "Cadillac Tax") have been included in this valuation. The Excise Tax becomes effective in 2020, but the plan is not expected to be subject to the tax until 2065 based on current plan provisions, assumptions and participant demographics. The Unfunded Actuarial Accrued Liability is increased by the $122 million present value of the estimated Excise Taxes in future years, and the associated increase to the ARC is $5 million.

Medicare Part D

The Medicare Prescription Drug Improvement and Modernization Act of 2003 introduced a prescription drug benefit under Medicare (Medicare Part D) as well as a federal subsidy to sponsors of retiree healthcare benefit plans that provide a prescription drug benefit that is at least actuarially equivalent to the basic coverage provided under Medicare Part D (the Retiree Drug Subsidy).

For purposes of GASB No. 43, the valuation of future OPEB may not reflect the anticipated receipt of future federal government subsidy payments under the Medicare Part D Prescription Drug Program as required under GASB Technical Bulletin No. 2006-1. The Bulletin requires that Retiree

Drug Subsidy payments to an employer be reported by the employer as revenue, rather than being netted against the employer's OPEB cost for prescription drug coverage.

ERS implemented an Employer Group Waiver Plan plus Commercial Wrap (EGWP plus Wrap) on January 1, 2013 in order to provide the plan with the benefit of increased subsidies and discounts available under such an arrangement. The Retiree Drug Subsidy is being phased out as a result of the implementation of the EGWP plus Wrap. The Retiree Drug Subsidies are excluded from this valuation in accordance with GASB Technical Bulletin No. 2006-1.

The projected cost of the EGWP plus Wrap reflects the subsidies to SilverScript Insurance Company, the administrator of the plan, which are expected to be provided by the Federal government under Medicare Part D and the discounts expected to be provided by drug manufacturers as required under the ACA.

New Governmental Accounting Standard

In June of 2015, the Governmental Accounting Standards Board adopted a new accounting standard that will replace GASB No. 43. GASB No. 74 – *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans* will replace GASB No. 43 effective for fiscal years starting after June 15, 2016 (i.e., FY17 for the GBP OPEB), although GASB encourages earlier adoption.

GASB No. 74 will require a number of significant accounting changes. The primary changes are summarized below:

- Investment Return Assumption (Discount Rate): For unfunded plans like the GBP OPEB, the discount rate is based on yields of 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher. Funded plans, however, may continue to use an assumption similar to the current discount rate. Given the current PAYGO funding approach, the expected discount rate in FY17 could be lower than the current discount rate, depending on the assumptions used for the yields of these tax-exempt bonds.

- Notes to Financial Statement and RSI: The Net OPEB Liability will be shown in the Notes to the Financial Statement and the RSI. This liability is equal to difference between the OPEB liability (i.e., the Actuarial Accrued Liability determined using the new discount rate) and the fair value of plan assets. Because GBP OPEB has no plan assets and uses the PAYGO approach, the Net OPEB Liability will be equal to the GBP OPEB Actuarial Accrued Liability.

  Additionally, there will be increased note disclosures and supplementary information which include:

  - a sensitivity analysis of:
    - the Net OPEB Liability to ±1% changes in the discount rate, and
    - the Net OPEB Liability to ±1% changes in the health benefit cost trend rate

- a 10-year schedule of:
  - the Net OPEB Liability reconciliation, and
  - investment returns.

At the request of ERS, we can prepare a study that analyzes the effect of this new accounting standard.

Variability in Future Actuarial Measurement

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following:

- Plan experience differing from that anticipated by the economic or demographic assumptions;
- Changes in economic or demographic assumptions;
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and
- Changes in plan provisions, applicable law or applicable accounting standards.

We have not been asked to perform and have not performed any stochastic or deterministic sensitivity analyses of the potential ranges of such future measurements. If you have an interest in the results of any such analysis, please let us know.

Please let us know if you have any questions or need additional information concerning this report.

Respectfully submitted,

Philip S. Dial, F.S.A.

Mitchell L. Bilbe, F.S.A.

Christopher S. Johnson, F.S.A.

PSD/MLB/CSJ:ec

Enclosures

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GASB STATEMENT NO. 43
ACTUARIAL VALUATION

AS OF AUGUST 31, 2016
FOR THE FISCAL YEAR ENDING AUGUST 31, 2016

FOR THE
OTHER POST-EMPLOYMENT BENEFITS UNDER THE
TEXAS EMPLOYEES
GROUP BENEFITS PROGRAM

RUDD AND WISDOM, INC.
AUSTIN, TEXAS

NOVEMBER 2016

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Section I - Certification of GASB No. 43 Actuarial Valuation

At the request of the Employees Retirement System of Texas (ERS), we have performed an actuarial valuation of the Other Post-Employment Benefits provided under the Texas Employees Group Benefits Program (GBP) for the twelve-month period ending August 31, 2016 (GBP OPEB). The purpose of this report is to present the results of our valuation and provide the information necessary to determine financial statement entries consistent with the Governmental Accounting Standards Board Statement No. 43 Financial Reporting for Post-Employment Benefit Plans Other Than Pension Plans (GASB No. 43).

Actuarial computations under GASB No. 43 are for purposes of fulfilling governmental plan financial accounting requirements. The calculations reported herein have been made on a basis consistent with our understanding of GASB No. 43 and the GBP. The information presented in this report is solely for purposes of compliance with GASB No. 43. This report does not provide any advice with respect to the manner in which the benefits are funded (i.e., pay-as-you go funding as opposed to prefunding the benefits).

We have based our valuation on employee data as of August 31, 2016 provided by ERS and the Teachers Retirement System (TRS) and plan provisions provided by ERS. We have used the actuarial methods and assumptions described in Section VII of this report. The actuarial valuation has been performed on the basis of the plan benefits described in Section VIII.

To the best of our knowledge, all current active and retired employees eligible to participate in the plan as of the valuation date and all other individuals who have a vested benefit under the plan have been included in the valuation. Furthermore, to the best of our knowledge and belief, all plan benefits have been considered in the development of costs.

ERS and TRS remain solely responsible for the accuracy and comprehensiveness of the respective data provided. However, to the best of our knowledge, no material biases exist with respect to any imperfections in the data provided by these sources. To the extent that any imperfections exist in the data records, we have relied on best estimates provided by ERS and TRS. We have not audited the data provided, but have reviewed it for reasonableness and consistency relative to previously provided information.

To the best of our knowledge, the actuarial information supplied in this report is complete and accurate. In our opinion, each of the assumptions used is reasonably related to the experience of the plan and to reasonable expectations and represents our best estimate of anticipated experience under the plan solely with respect to that individual assumption. All of our work conforms to generally accepted actuarial principles and practices and to the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Rudd and Wisdom, Inc. prepared and presented in Section V of this report the Schedule of Funding Progress and the Schedule of Employer Contributions that are to be included in the Required Supplementary Information.

The undersigned individuals are members of the American Academy of Actuaries who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Mitchell L. Bilbe, F.S.A.
Member of American Academy of Actuaries

Philip S. Dial, F.S.A.
Member of American Academy of Actuaries

Christopher S. Johnson, F.S.A.
Member of American Academy of Actuaries

Section II - Summary of Valuation Results

All employer liabilities and costs presented throughout this report are net of any member contributions, member cost sharing and formulary rebates. For convenience, the information presented in Item D on page II-3 combines the information presented in Items A, B and C below.

A. Number of Group Benefits Program Members as of August 31, 2016

	Members	Covered Spouses	Covered Dependent Children	Total
Actives	235,108[1]	41,564[2]	126,597[2]	403,269[2]
Deferred Vesteds	11,329	0[2]	0[2]	11,329[2]
Retirees and Nominees	113,430[3]	29,153	9,757	152,340
Total	**359,867**	**70,717**	**136,354**	**566,938**

[1] Includes return-to-work retirees and employees who have not yet satisfied the waiting period.
[2] Rather than use current spouse/dependent child coverage information, actuarial assumptions are used to estimate the future number of spouses and dependent children that will be covered at retirement.
[3] Includes 3,968 retirees who receive the Opt-Out Credit in lieu of health benefits.

B. Liabilities as of August 31, 2016

The **Actuarial Present Value of Total Projected Benefits** is the amount of assets that would have to be invested on the valuation date so that the amount invested plus future investment earnings would provide sufficient assets to pay total projected benefits when due.

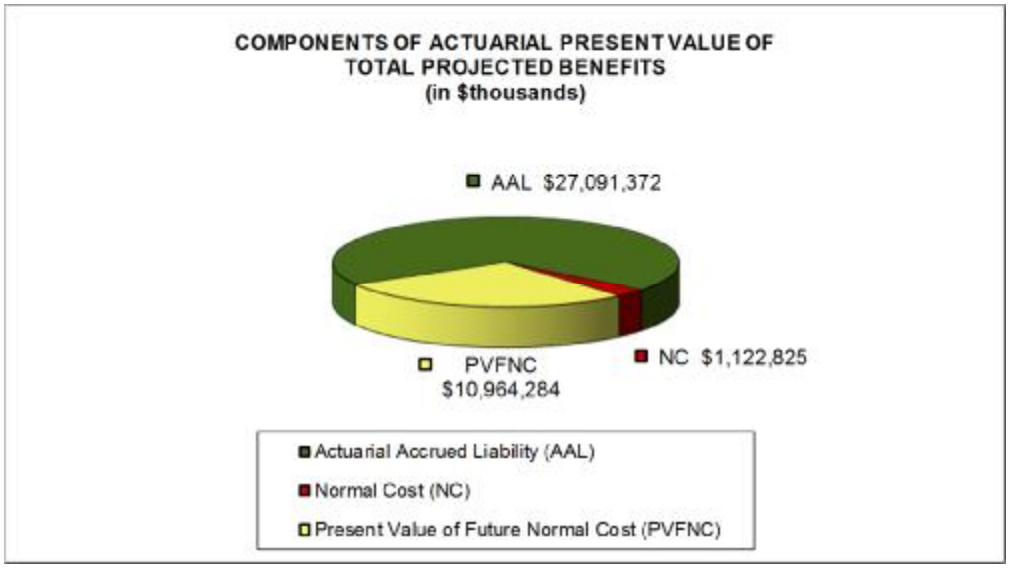
The **Actuarial Accrued Liability** is the portion of the Actuarial Present Value of Total Projected Benefits that is attributed to the plan members' past employment service as of the valuation date.

The **Normal Cost** is the portion of the Actuarial Present Value of Total Projected Benefits that is attributed to the plan members' current year of employment service.

The **Actuarial Present Value of Future Normal Costs** is the portion of the Actuarial Present Value of Total Projected Benefits expected to be attributed to plan members' future years of employment service. (As shown below, it does not include the current year Normal Cost.)

	Actuarial Present Value of Total Projected Benefits ($ thousands)	Actuarial Accrued Liability ($ thousands)	Normal Cost ($ thousands)	Actuarial Present Value of Future Normal Costs ($ thousands)
Actives	$ 27,095,499	$ 15,008,390	$ 1,122,825	$ 10,964,284
Deferred Vesteds	1,363,010	1,363,010	0	0
Retirees and Nominees	10,719,971	10,719,971	0	0
Total	**$ 39,178,481[a]**	**$ 27,091,372[a]**	**$ 1,122,825**	**$ 10,964,284**

[a] Adjusted due to rounding error caused by rounding individual components.



C. Actuarial Value of Plan Assets, Unfunded Actuarial Accrued Liability and Annual Required Contribution for FY 2016

The **Actuarial Value of Plan Assets** is the fair market value of plan assets available as of the valuation date to pay for plan benefits.

The **Unfunded Actuarial Accrued Liability** is excess of the Actuarial Accrued Liability over the Actuarial Value of Plan Assets.

The **Annual Required Contribution** (ARC) represents the amount of the contribution that would be required to fund the Normal Cost and amortize the Unfunded Actuarial Accrued Liability over a period of 30 years. Details of the development of the ARC may be found in the next section of this report.

Actuarial Valuation Date	Actuarial Value of Plan Assets ($ thousands)	Unfunded Actuarial Accrued Liability ($ thousands)	Annual Required Contribution (ARC) ($ thousands)
August 31, 2016	**$ 0**	**$ 27,091,372**	**$ 2,298,514[1]**

[1] Comprised of Normal Cost of $1,122,824,902 and $1,175,689,003 to amortize the Unfunded Actuarial Accrued Liability over a period of 30 years.

D. Summary of Results for FY 2016

Actuarial Valuation Results as of August 31, 2016		
	($ thousands)	As a % of Payroll
1. Number of Members (actual count, not in thousands)		
a. Actives	235,108	
b. Deferred Vesteds	11,329	
c. Retirees and Nominees	113,430	
d. Total Number of Members	359,867	
2. Payroll of Active Members for FY 2016	$ 11,786,869	
3. Actuarial Present Value of Total Projected Benefits		
a. Actives	$ 27,095,499	
b. Deferred Vesteds	1,363,010	
c. Retirees and Nominees	10,719,971	
d. Total	$ 39,178,481[1]	332.4%
4. Actuarial Accrued Liability		
a. Actives	$ 15,008,390	
b. Deferred Vesteds	1,363,010	
c. Retirees and Nominees	10,719,971	
d. Total	$ 27,091,372[1]	229.8%
5. Actuarial Value of Assets	$ 0	0.0%
6. Unfunded Actuarial Accrued Liability [4.d. – 5.]	$ 27,091,372	229.8%
7. Annual Required Contribution for FYE August 31, 2016		
a. Normal Cost	$ 1,122,825	9.5%
b. Amortization of UAAL	1,175,689	10.0%
c. Total ARC for FYE August 31, 2016	$ 2,298,514	19.5%

[1] Adjusted due to rounding error caused by rounding individual components.

E. Changes in Liabilities Since the Prior Valuation

The Actuarial Accrued Liability and the Normal Cost have both increased since the prior valuation due to the combined effect of growth due to passage of time, Actuarial Gains, changes to the Actuarial Assumptions, and changes to the plan provisions.

An **Actuarial Gain or Loss** occurs from one valuation to the next if the experience of the plan differs from that anticipated by the actuarial assumptions. The plan experienced gains in the Actuarial Accrued Liability during the fiscal year ending August 31, 2016 as shown in the table on the next page.

The **Actuarial Assumptions** are used to project the demographic events and economic forces that affect the cost of the plan. Since the last valuation was prepared for this plan, the assumptions for Expenses and Per Capita Health Benefit Costs have been updated to reflect recent health plan experience and its effects on our short-term expectations. In addition, the percentage of future retirees electing to participate in the HealthSelect Medicare Advantage program at the earliest date at which coverage can commence, the proportion of future retirees covering dependent children and the percentage of future retirees and retiree spouses assumed to use tobacco have been updated to reflect recent plan experience and expected trends.

Since the last valuation was prepared for this plan, benefit changes have been adopted. The benefit changes for retirees for whom Medicare is not primary include: (a) an increase in the overall annual out-of-pocket maximum in accordance with the requirements of the Affordable Care Act (ACA) (effective January 1, 2017) and (b) implementation of (i) a program under which HealthSelect participants can consult with a licensed physician from their mobile device and (ii) an online weight loss program available to eligible HealthSelect participants not enrolled in Medicare Part B. These minor benefit changes have been reflected in the FY 2017 Assumed Per Capita Health Benefit Costs. In addition, effective September 1, 2016, retirees for whom Medicare is not primary may elect to participate in Consumer Directed HealthSelect, a high-deductible health plan and a health savings account, in lieu of HealthSelect. Retiree participation in Consumer Directed HealthSelect is expected to be minimal. There are no benefit changes for Medicare Primary retirees. Also, effective September 1, 2016, all employees, retirees and their dependents may elect to participate in the State of Texas Vision plan. This plan is self-funded through contributions made by employees and retirees. The State does not contribute towards vision coverage.

The table on the next page summarizes the effects of significant factors affecting the Actuarial Accrued Liability and the Normal Cost. Because 100% of the Normal Cost is attributable to Active plan members while only 55% of the Actuarial Accrued Liability is attributable to Active plan members, these factors affect the total Actuarial Accrued Liability and the Normal Cost differently. Additionally, due to the mechanics of the Entry Age Normal cost method, some factors affect the Active Actuarial Accrued Liability and Normal Cost differently as well.

Changes to Liability Since the Prior Valuation		
	Approximate Increase / (Decrease)	
Factor	Actuarial Accrued Liability (in $ thousands)	Normal Cost (in $ thousands)
Growth due to passage of time[1]	$ 1,691,396	$ 36,536
Actuarial (Gains)/Losses	(310,850)	30,753
Assumption Changes[2]	(29,872)	11,659
Plan Changes	0	0
Total	$ 1,350,674	$ 78,948

[1] Since OPEB is funded on a PAYGO basis, the excess of (a) the Normal Cost plus (b) interest over (c) the PAYGO contribution increases the Actuarial Accrued Liability. Since the Normal Cost is determined as a level percentage of payroll, it will increase due to payroll growth resulting from growth in the number of active employees and inflationary increases in the salaries.

[2] Includes plan benefit changes as reflected in the FY 2017 Assumed Per Capita Health Benefit Costs.

Section III - Accounting Information

A. Development of the Annual Required Contribution (ARC)

Under GASB No. 43, the ARC[1] is sum of: (1) the value of benefits accrued during the year (the Normal Cost) and (2) the amortization of the Unfunded Actuarial Accrued Liability. We have computed the ARC amortizing the Unfunded Actuarial Accrued Liability over the maximum period of 30 years as a level percentage of projected payroll.

The Employer is not *required* to contribute the ARC, as the name implies. The ARC represents the amount of the contribution that would be required to fund the Normal Cost and amortize the Unfunded Actuarial Accrued Liability over a period of 30 years.

1. Normal Cost	$ 1,122,824,902
2. Amortization of Unfunded Actuarial Accrued Liability[2]	1,175,689,003
3. ARC for Fiscal Year Ending August 31, 2016 [1. + 2.]	**$ 2,298,513,905**

B. Contribution Deficiencies/(Excess Contributions)

Contribution Deficiencies/(Excess Contributions) occur when the Employer makes contributions that are less than (that exceed) the ARC. Amortization of a Contribution Deficiency/(Excess Contribution) is delayed until the next actuarial valuation[3]. Such amortization occurs in the development of the following year's ARC.

1. Annual Required Contribution (ARC)	$ 2,298,513,905
2. Employer Contributions for Fiscal Year Ending August 31, 2016	666,135,663[4]
3. Contribution Deficiency/(Excess Contribution) [1. – 2.]	**$ 1,632,378,242**

[1] Defined in Paragraph No. 34.f. of GASB No. 43.
[2] Amortized over 30 years as a level percentage of projected payroll.
[3] Pursuant to Paragraph No. 34.g. of GASB No. 43.
[4] Includes Medicare Part D Retiree Drug Subsidies.

Section IV - Notes to the Financial Statements

Pursuant to Paragraphs No. 30 of GASB No. 43 the following information should be included in the Notes to the Financial Statements.

A. Plan Description

1. Plan Name

   Other Post-Employment Benefits provided under the Texas Employees Group Benefits Program (GBP)

2. Plan Type

   The GBP is a cost-sharing multiple-employer defined benefit OPEB plan. Employers participating in the GBP include:

   a. the State of Texas which is the employer for all state agency employees and employees of senior colleges and universities,

   b. 50 Texas junior and community colleges,

   c. the Texas Municipal Retirement System, Texas County and District Retirement System and the Texas Turnpike Authority,

   d. Community Supervision and Corrections Departments.

3. Employees Covered

   a. State agency and higher education employees must meet the following classification requirements in order to be eligible for OPEB provided they also meet certain age and service conditions.

      i. State Agency or Higher Education Employee

         An individual must be an elected or appointed officer or employee who performs service (other than an independent contractor) for the State of Texas, including an institution of higher education, other than the University of Texas or Texas A&M University Systems, and who:

         a) receives compensation for the service performed pursuant to a payroll certified by a state agency or by an elected or appointed officer, or

         b) receives compensation for service performed for an institution of higher education pursuant to a payroll certified by an institution of higher education or by an elected or appointed officer of the State.

ii. Employees of Certain Other Entities

a) Officers or employees of Texas Municipal Retirement System or Texas County and District Retirement System

b) Certain employees or officers of the Texas Turnpike Authority

c) Employees of the Community Supervision and Corrections Departments

b. Number of Plan Members as of August 31, 2016

	Members	Covered Spouses	Covered Dependent Children	Total
Actives	235,108[1]	41,564[2]	126,597[2]	403,269[2]
Deferred Vesteds	11,329	0[2]	0[2]	11,329[2]
Retirees and Nominees	113,430[3]	29,153	9,757	152,340
Total	**359,867**	**70,717**	**136,354**	**566,938**

[1] Includes return-to-work retirees and employees who have not yet satisfied the waiting period.
[2] Rather than use current spouse/dependent child coverage information, actuarial assumptions are used to estimate the future number of spouses and dependent children that will be covered at retirement.
[3] Includes 3,968 retirees who receive the Opt-Out Credit in lieu of health benefits.

4. Brief Description of Benefit Provisions

a. The GBP provides self-funded group health (medical and prescription drug) benefits for eligible retirees under HealthSelect. The GBP also provides a fully insured medical benefit option for Medicare-primary participants under the HealthSelect Medicare Advantage Plan. An eligible retiree who has retired from full-time employment does not contribute toward the cost of coverage for himself/herself, but he/she pays a portion of the cost if he/she covers an eligible spouse or dependent child*. An eligible retiree who has retired from part-time employment contributes toward the cost of coverage for himself/herself, as well as paying a portion of the cost if he/she covers an eligible spouse or dependent child.

b. The GBP also provides life insurance benefits to eligible retirees via a minimum premium funding arrangement.

* SB 1459 requires employees who have less than 5 years of eligible service credit on September 1, 2014 to pay a larger portion of the cost of insurance if they retire with less than 20 years of eligible service credit on or after September 1, 2014.

B. Summary of Significant Accounting Policies

1. Basis of Accounting

The GBP financial statements are prepared using the accrual basis of accounting. Plan member contributions are recognized in the period in which the contributions are due. Employer contributions are recognized when due and the employer has made a formal commitment to provide the contributions. Benefits are recognized when related expenses are incurred.

2. Method Used to Value Investments

   Investments are reported at fair value.

C. Contributions and Reserves

1. The authority under which the obligations of the plan members and Employer are established and/or may be amended is Chapter 1551, Texas Insurance Code.

2. The Employer and member contribution rates are determined annually by the ERS Board Trustees based on the recommendations of the ERS staff and consulting actuary. The contribution rates are determined based on (i) the benefit and administrative costs expected to be incurred, (ii) the funds appropriated and (iii) the funding policy established by the Texas Legislature in connection with benefits provided through the GBP. The Trustees revise benefits when necessary to match expected benefit and administrative costs with the revenue expected to be generated by the appropriated funds.

3. There are no long-term contracts for contributions to the plan.

D. Funded Status of the Plan as of Current Valuation Date

(Although this information is repeated in the RSI, it is required to be included in the Notes to the Financial Statements.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Actuarial Valuation Date	**Actuarial Value of Assets**	**Actuarial Accrued Liability**	**Unfunded Actuarial Accrued Liability (UAAL) {(3) - (2)}**	**Funded Ratio {(2)/(3)}**	**Annual Covered Payroll**	**Ratio of UAAL to Covered Payroll {(4)/(6)}**
August 31, 2016	**$ 0**	**$ 27,091,371,728**	**$ 27,091,371,728**	**0.0%**	**$ 11,786,869,252**	**229.8%**

E. Statement of Plan Net Assets

Statement of Plan Net Assets as of August 31, 2016		
Investment Category	**Fair Value**	
1. Current Assets		
a. Cash and Cash Equivalents		
i) Cash on Hand	$ 6,282	
ii) Cash in State Treasury	19,082,017	
iii) Certificates of Deposit	0	
iv) Total Cash and Cash Equivalents	$ 19,088,299	
b. Securities Lending Collateral	$ 0	
c. Short-Term Investments	$ 543,162,004	
d. Receivables		
i) Interest Receivable	$ 166,142	
ii) Contributions/Accounts Receivable	24,735,782	
iii) Due from Other Funds	228,862	
iv) Federal Receivable	93,363,086	
v) Total Receivables	$ 118,493,872	
e. Total Current Assets [1.a.iv.+ 1.b. + 1.c. + 1.d.v.]		$ 680,744,175
2. Non-Current Assets		
a. Investments		
i) U.S. Government and Agency Obligations	$ 0	
ii) Corporate Obligations	0	
iii) Total Investments	$ 0	
b. Capital Assets, Depreciable		
i) Furniture and Equipment	$ 0	
ii) Less: Accumulated Depreciation	0	
iii) Net Capital Assets	$ 0	
c. Total Non-Current Assets [2.a.iii. + 2.b.iii.]		$ 0
3. Liabilities		
a. Claims Payable	$ 173,550,040	
b. Payables Due to Other Funds	506,780,364	
c. Unearned Revenue	413,771	
d. Total Liabilities [3.a. + 3.b. + 3.c.]		$ 680,744,175
4. Total Fair Value of Plan Net Assets as of August 31, 2016 [1.e. + 2.c. - 3.d.]		$ 0

F. Statement of Changes in Plan Net Assets

Statement of Changes in Plan Net Assets for FYE August 31, 2016		
1. Plan Net Assets as of September 1, 2015		**$ 0**
2. Additions		
a. Contributions		
i. Employer[1]	**$ 666,135,663**	
ii. Plan Members	**183,284,339**	
iii. Federal Revenue – Medicare Part D - EGWP	**67,036,433**	
iv. Total Contributions		**$ 916,456,435[2]**
b. Net Investment Income		
i. Net appreciation/(depreciation) in Fair Value of Plan Investments	**$ 0**	
ii. Interest income, dividend income, and other income	**1,136,997**	
iii. Total Investment Expense	**0**	
iv. Net Investment Income		**$ 1,136,997**
c. Other Additions		**$ 5,960,826**
d. Total Additions [2.a.iv. + 2.b.iv. + 2.c.]		**$ 923,554,258**
3. Deductions		
a. Benefits	**$ 912,885,686**	
b. Refunds to Plan Members	**0**	
c. Total Administrative Expense	**10,668,572**	
d. Total Deductions		**$ 923,554,258[3]**
4. Plan Net Assets as of August 31, 2016 [1. + 2.d. – 3.d.]		**$ 0**

1 Includes Federal Revenues of $2,149,125 for Medicare Part D Retiree Drug Subsidies.
2 Includes changes in receivables and amounts due from other funds.
3 Includes changes in payables and unearned revenue.

G. Disclosure of Information about Actuarial Methods and Assumptions

The following information is required to be disclosed in accordance with Paragraph No. 30.d. of GASB 43.

1. Actuarial valuations involve estimates of the value of reported amounts and assumptions about the probability of events far into the future, and actuarially determined amounts are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future.

2. The required schedule of funding progress immediately following the notes to the financial statements presents multi-year trend information about whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liability for benefits.

3. GASB No. 43 calculations are based on the types of benefits provided under the terms of the substantive plan at the time of each valuation and on the pattern of sharing of costs between the employer and plan members to that point. In addition, the projection of benefits for financial reporting purposes *does not* explicitly incorporate the potential effects of legal or contractual funding limitations on the pattern of cost sharing between the employer and plan members in the future.

4. Actuarial calculations reflect a long-term perspective. In addition, consistent with that perspective, actuarial methods and assumptions used in developing the amounts in this report include techniques that are designed to reduce short-term volatility in actuarial accrued liabilities.

5. The information presented in the required supplementary schedules was determined as part of the actuarial valuation using the actuarial methods and assumptions summarized below. (For a complete description of all actuarial methods and assumptions, see Section VII of this report.)

Summary of Actuarial Methods and Assumptions	
Actuarial cost method	Entry Age Normal (Level percent of pay)
Asset valuation method	Market
Actuarial assumptions:	
Annual investment return assumption (discount rate)[1]	5.50%
Projected annual salary increases[1]	3.50% to 11.50%
Weighted-average at valuation date[1]	6.57%
Annual Healthcare Trend Rates[1]	8.50% in FY 2018 declining to 5.50% in FY 2024
Amortization method	Level percent of pay
Amortization period	30 year open period

[1] Includes inflation assumption of 3.50%.

Section V - Required Supplementary Information

Per Paragraph Nos. 17 and 31 of GASB No. 43, the following information should be presented immediately after the notes to the financial statements. GASB No. 43 requires that the notes illustrate the most recent three (3) years of historical data.

A. Schedule of Funding Progress

The Schedule of Funding Progress presents information as of the current valuation date and the two preceding valuation dates.

Schedule of Funding Progress						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability (UAAL) {(3) - (2)}	Funded Ratio {(2)/(3)}	Annual Covered Payroll	Ratio of UAAL to Covered Payroll {(4)/(6)}
08/31/14	$ 0	$ 24,701,903,876	$ 24,701,903,876	0.0%	$ 10,963,773,005	225.3%
08/31/15	$ 0	$ 25,740,697,653	$ 25,740,697,653	0.0%	$ 11,176,584,198	230.3%
08/31/16	$ 0	$ 27,091,371,728	$ 27,091,371,728	0.0%	$ 11,786,869,252	229.8%

B. Schedule of Employer Contributions

The Schedule of Employer Contributions presents contribution information as of the current valuation date and the two preceding valuation dates.

Schedule of Contributions from the Employer and Other Contributing Entities[1]			
Fiscal Year	Contribution[2]	ARC	Percentage of ARC Contributed
09/01/13 to 08/31/14	$ 620,640,622	$ 2,056,089,003	30.2%
09/01/14 to 08/31/15	$ 615,638,063	$ 2,160,950,964	28.5%
09/01/15 to 08/31/16	$ 666,135,663	$ 2,298,513,905	29.0%

[1] Title of table required by Paragraph No. 36 of GASB No. 43.
[2] Includes Medicare Part D Retiree Drug Subsidies for all years.

C. Notes to the Required Schedules

Per Paragraph No. 37 of GASB No. 43, the employer should disclose factors that significantly affect the identification of trends in the amounts reported above. For example, changes in benefit provisions or changes in actuarial methods and assumptions should be identified.

The following assumptions have been changed since the previous valuation:

- the Assumed Per Capita Health Benefit Costs and Assumed Expenses for retirees and dependents have been updated to reflect recent health plan experience;
- the percentage of future retirees electing to participate in the HealthSelect Medicare Advantage program at the earliest date at which coverage can commence, the proportion of future retirees covering dependent children and the percentage of future retirees and retiree spouses assumed to use tobacco have been updated to reflect recent plan experience and expected trends; and
- the Health Benefit Cost and Retiree Contribution Trends have been updated to reflect changes in short-term expectations due to recent health plan experience.

Benefit revisions have been adopted since the prior valuation. The benefit changes for retirees for whom Medicare is not primary include: (a) an increase in the overall annual out-of-pocket maximum in accordance with the requirements of the Affordable Care Act (ACA) (effective January 1, 2017) and (b) implementation of (i) a program under which HealthSelect participants can consult with a licensed physician from their mobile device and (ii) an online weight loss program available to eligible HealthSelect participants not enrolled in Medicare Part B. These changes are incorporated into this valuation in accordance with Question Number 49 of the *Guide to Implementation of GASB Statements 43 and 45 on Other Postemployment Benefits*. These minor benefit changes have been reflected in the FY 2017 Assumed Per Capita Health Benefit Costs. In addition, effective September 1, 2016, retirees for whom Medicare is not primary may elect to participate in Consumer Directed HealthSelect, a high-deductible health plan and a health savings account, in lieu of HealthSelect. Retiree participation in Consumer Directed HealthSelect is expected to be minimal. There are no benefit changes for Medicare Primary retirees. Also, effective September 1, 2016, all employees, retirees and their dependents may elect to participate in the State of Texas Vision plan. This plan is self-funded through contributions made by employees and retirees. The State does not contribute towards vision coverage.

Section VI - Detailed Valuation Results

A. Actuarial Valuation Date: August 31, 2016

B. Summary of Results as of August 31, 2016

	Number of Members	Actuarial Present Value of Total Projected Benefits	Actuarial Accrued Liability	Normal Cost	Payroll
Actives	235,108	$ 27,095,498,933	$ 15,008,390,128	$1,122,824,902	$ 11,786,869,252
Deferred Vesteds	11,329	1,363,010,360	1,363,010,360	-	-
Retirees & Nominees	113,430	10,719,971,240	10,719,971,240	-	-
Total	359,867	$ 39,178,480,533	$ 27,091,371,728	$1,122,824,902	$ 11,786,869,252

Annual Required Contribution (ARC) for FY 16	Employer Contributions[1] for FY 16	Percentage of ARC Contributed
$ 2,298,513,905	$ 666,135,663	29.0%

[1] Includes Medicare Part D Retiree Drug Subsidies.

C. Summary of Active Member Census

State Agency Employees[1]

Age and Service Table for Actives as of August 31, 2016

	Current Years of Benefit Service									*Age*	*Percent*
Current Age	*t<5*	*5 <= t < 10*	*10 <= t < 15*	*15 <= t < 20*	*20 <= t < 25*	*25 <= t < 30*	*30 <= t < 35*	*35 <= t < 40*	*40 <= t*	*Totals*	*of Total*
x < 20	571									571	0.38%
20 <= x < 25	8,139	72								8,211	5.43%
25 <= x < 30	13,409	1,853	61							15,323	10.12%
30 <= x < 35	11,097	5,104	1,428	97						17,726	11.71%
35 <= x < 40	8,246	4,681	3,104	1,405	41					17,477	11.55%
40 <= x < 45	6,866	3,953	2,882	3,202	1,329	48				18,280	12.08%
45 <= x < 50	6,209	3,864	2,867	3,456	3,520	1,419	66			21,401	14.14%
50 <= x < 55	5,108	3,527	2,661	2,997	2,862	2,272	521	24		19,972	13.20%
55 <= x < 60	4,085	3,229	2,518	2,641	2,126	1,234	619	221	6	16,679	11.02%
60 <= x < 65	2,243	2,519	1,801	1,943	1,136	646	338	185	53	10,864	7.18%
65 <= x < 70	652	936	718	513	398	202	95	43	74	3,631	2.40%
x >= 70	228	287	220	193	143	60	34	15	25	1,205	0.80%
Service Totals	66,853	30,025	18,260	16,447	11,555	5,881	1,673	488	158	151,340	100.00%
Percent of Total	44.17%	19.84%	12.07%	10.87%	7.64%	3.89%	1.11%	0.32%	0.10%	100.00%	

1) Excludes 2,560 Return-to-Work Retirees.

Higher Education Employees[1]

Age and Service Table for Actives as of August 31, 2016

	Current Years of Benefit Service									*Age*	*Percent*
Current Age	*t<5*	*5 <= t < 10*	*10 <= t < 15*	*15 <= t < 20*	*20 <= t < 25*	*25 <= t < 30*	*30 <= t < 35*	*35 <= t < 40*	*40 <= t*	*Totals*	*of Total*
x < 20	10									10	0.01%
20 <= x < 25	1,245	5								1,250	1.67%
25 <= x < 30	4,598	536	9							5,143	6.89%
30 <= x < 35	4,817	2,369	480	17						7,683	10.29%
35 <= x < 40	4,076	2,495	1,580	562	12					8,725	11.68%
40 <= x < 45	3,064	2,125	1,649	1,393	292	12				8,535	11.43%
45 <= x < 50	2,687	2,057	1,648	1,946	771	158	17			9,284	12.43%
50 <= x < 55	2,349	1,868	1,496	2,439	896	187	130	25		9,390	12.57%
55 <= x < 60	2,011	1,755	1,476	2,860	974	135	131	159	2	9,503	12.72%
60 <= x < 65	1,384	1,435	1,298	2,899	755	75	83	136	22	8,087	10.83%
65 <= x < 70	621	778	759	1,582	716	38	47	52	23	4,616	6.18%
x >= 70	262	318	357	317	775	387	12	19	9	2,456	3.29%
Service Totals	27,124	15,741	10,752	14,015	5,191	992	420	391	56	74,682	100.00%
Percent of Total	36.32%	21.08%	14.40%	18.77%	6.95%	1.33%	0.56%	0.52%	0.07%	100.00%	

1) Excludes 99 Return-to-Work Retirees.

Other Employees (i.e., Employees of TMRS, TCDRS, TTA and CSCD)[1]

Age and Service Table for Actives as of August 31, 2016

	Current Years of Benefit Service									*Age*	*Percent*
Current Age	*t<5*	*5 <= t < 10*	*10 <= t < 15*	*15 <= t < 20*	*20 <= t < 25*	*25 <= t < 30*	*30 <= t < 35*	*35 <= t < 40*	*40 <= t*	*Totals*	*of Total*
x < 20	20									20	0.32%
20 <= x < 25	257	2								259	4.05%
25 <= x < 30	534	57	2							593	9.28%
30 <= x < 35	477	211	50	4						741	11.59%
35 <= x < 40	359	210	131	51	1					753	11.78%
40 <= x < 45	296	178	115	125	41	2				756	11.83%
45 <= x < 50	261	188	118	141	123	55	3			889	13.90%
50 <= x < 55	214	162	119	133	127	109	25	4		892	13.95%
55 <= x < 60	177	140	123	122	95	62	34	16	0	768	12.01%
60 <= x < 65	100	111	90	87	50	36	18	11	3	506	7.92%
65 <= x < 70	27	41	35	22	18	10	5	2	4	164	2.57%
x >= 70	9	12	11	8	7	3	1	1	1	53	0.83%
Service Totals	2,731	1,312	793	693	461	277	86	34	9	6,396	100.00%
Percent of Total	42.71%	20.51%	12.40%	10.84%	7.21%	4.32%	1.35%	0.53%	0.14%	100.00%	

1) Excludes 31 Return-to-Work Retirees.

D. Summary of Deferred Vested Member Census by Age and Employer

Vested Members By Age and Employer as of August 31, 2016

	Employer			*Age*	*Percent*
Current Age	*State Agency*	*Higher Education*	*Other*[1]	*Totals*	*of Total*
x < 35	93	40	0	133	1.17%
35 <= x < 40	394	264	0	658	5.81%
40 <= x < 45	893	482	0	1,375	12.14%
45 <= x < 50	1,534	628	0	2,162	19.08%
50 <= x < 55	1,989	795	0	2,784	24.57%
55 <= x < 60	1,798	829	1	2,628	23.20%
60 <= x < 65	601	640	1	1,242	10.96%
x >=65	109	238	0	347	3.06%
Employer Totals	7,411	3,916	2	11,329	100.00%
Percent of Total	65.42%	34.57%	0.02%	100.00%	

[1] *Employees of TMRS, TCDRS, TTA and CSCD.*

E. Summary of Retiree and Nominee Member Census by Age and Employer

Retirees and Nominees By Age and Employer as of August 31, 2016[1]

	Employer			*Age*	*Percent*
Current Age	*State Agency[2]*	*Higher Education*	*Other[3]*	*Totals*	*of Total*
x < 40	60	5	0	65	0.06%
40 <= x < 45	70	9	3	82	0.07%
45 <= x < 50	360	21	27	408	0.36%
50 <= x < 55	3,943	143	126	4,212	3.71%
55 <= x < 60	9,241	828	298	10,367	9.14%
60 <= x < 65	15,688	2,367	482	18,537	16.34%
65 <= x < 70	20,235	5,097	551	25,883	22.82%
70 <= x < 75	15,522	5,646	297	21,465	18.92%
75 <= x < 80	9,813	4,586	94	14,493	12.78%
80 <= x < 85	6,447	3,019	27	9,493	8.37%
85 <= x < 90	3,579	1,856	8	5,443	4.80%
90 <= x < 95	1,569	692	3	2,264	2.00%
95 <= x < 100	422	211	1	634	0.56%
x >= 100	67	17	0	84	0.07%
Employer Totals	87,016	24,497	1,917	113,430	100.00%
Percent of Total	76.71%	21.60%	1.69%	100.00%	

1) Comprised of 53,864 retirees and nominees enrolled in HealthSelect Medicare Advantage, 55,598 retirees and nominees enrolled in HealthSelect and 3,968 retirees who receive the Opt-Out Credit in lieu of health benefits.

2) Includes 3,260 State Agency Retirees, 661 Higher Education Retirees and 47 Other Retirees receiving the Opt-Out Annuity.

3) Employees of TMRS, TCDRS, TTA and CSCD.

Section VII - Actuarial Methods and Assumptions

A. Actuarial Methods

1. **Actuarial Funding Method**

The Entry Age Normal actuarial funding method is used in determining the contribution requirements for the plan. The actuarial funding method is the procedure by which the actuary determines a series of annual contributions which, along with current assets and future investment earnings, will fund the expected plan benefits. The Entry Age Normal funding method compares the excess of the present value of expected future plan benefits over the current value of plan assets. This difference represents the expected present value of current and future contributions that will be paid into the plan. The contributions are divided into two components: an annual Normal Cost and an amortization charge for the unfunded accrued liability.

The Normal Cost for the plan is the sum of individually determined Normal Costs for each active member. Each active member's Normal Cost is the current annual contribution in a series of annual contributions which, if made throughout the member's total period of employment, would fund his expected benefits from the plan. Each member's Normal Cost is calculated to be a constant percentage of his expected compensation in each year of employment.

The plan's current accrued liability is the excess of the present value of expected future benefits over the present value of all future remaining Normal Cost contributions for all active members. The unfunded accrued liability is the amount by which the accrued liability exceeds the current plan assets. The unfunded accrued liability is recalculated each time a valuation is performed and is amortized as a level percentage of projected payroll in accordance with employer funding goals and GASB guidelines. Experience gains and losses, which represent deviations of the unfunded accrued liability from its expected value based on the prior valuation, are determined at each valuation and are amortized as part of the unfunded accrued liability.

2. **Actuarial Value of Assets**

The Actuarial Value of Assets is equal to the fair market value of plan assets as determined by the plan administrator, including any receivable contributions made for a prior plan year which were not recognized by the plan administrator as of the asset valuation date.

B. Actuarial Assumptions

The actuarial valuation of the GBP OPEB requires the use of numerous actuarial assumptions many of which are similar to the assumptions used in performing the actuarial valuations of the retirement plans in which the GBP members participate. State agency members participate in the ERS retirement plan while many higher education members participate in the TRS retirement plan. For consistency with those valuations, for purposes of our valuation of the GBP OPEB we have utilized the applicable assumptions previously adopted by the Trustees of

the respective systems at the time our valuation is performed. In other words, we have used applicable ERS retirement plan assumptions for the valuation of OPEB for state agency members and, except as indicated below, we have used TRS retirement plan assumptions for the valuation of OPEB for higher education members. It should be noted that we have applied the TRS assumptions to all higher education members including those who have opted to participate in the optional retirement plan (ORP) instead of TRS. Although it may be preferable to eventually develop a body of data that would enable ORP specific assumptions to be used, such data does not presently exist. In the absence of such data, it is our opinion that the TRS demographic and pay-related assumptions can be reasonably applied to ORP participants.

In addition to the assumptions used in the retirement plan valuations, the OPEB valuation requires certain unique assumptions, specifically, the health benefit cost trend and the discount rate, both of which are described below.

The assumptions used in this report are summarized below.

1. **Demographic Assumptions**

The tables of decrements below contain rates (not probabilities) of decrement.

a. **Mortality**: The members of the GBP are expected to exhibit mortality in accordance with the following mortality tables:

i. State Agency Members (assumptions used in valuing the applicable ERS retirement plan)

a) Service Retirees, Survivors and other Inactive Members (Regular, Elected, CPO/CO and JRS I and II Employee Classes):
Generational Mortality using 1994 Group Annuity Mortality tables without adjustment for males and set forward 2 years for females and Projection Scale AA from the year 2000

b) Disability Retirees (Regular, Elected, CPO/CO and JRS I and II Employee Classes):
RP-2000 Disabled Retiree Mortality set forward 6 years for males and set back one year for females

c) Active Members*:
Generational Mortality using 1994 Group Annuity Mortality tables without adjustment for males and set forward 2 years for females and Projection Scale AA from the year 2000

* For Regular Employee Class and CPO/CO Class members, 2.0% of active male deaths and 0.3% of active female deaths are assumed to be occupational.

ii. Higher Education Members[1] (assumptions used in valuing the TRS retirement plan)

a) Service Retirees, Survivors and other Inactive Members:
Tables based on TRS experience with full generational projection using Scale BB from Base Year 2014. Illustrative base rates before applying the projection scale are shown in the table below.

Annual Rates of Inactive Member Mortality per 100 Members

Age	Male	Female
50	0.4247	0.2791
60	0.5584	0.3882
70	1.5547	0.9613
80	5.3691	3.5591
90	16.2983	13.3727
100	40.7509	28.4047

b) Disability Retirees:
The same mortality as described in B.1.a.ii.a. above but using a 3-year set forward and minimum mortality rates of four per 100 male members and two per 100 female members.

c) Active Members:
Sex Distinct RP-2014 Employee Mortality multiplied by 90% with full generational projection using Scale BB.

b. **Retirement**: A member is assumed to retire in accordance with the following annual rates:

i. State Agency Members (assumptions used in valuing the applicable ERS retirement plan)

a) Active Regular Employee Class Members hired before September 1, 2009:
ERS Decrement Service is used to determine when the rates apply:
- Age 60 with 5 years of service
- Rule of 80 with 5 years of service

Sample rates for eligible members:

Annual Service Retirement Rates Per 100
Regular Employee Class Members Hired Before September 1, 2009

	Males – Years of ERS Decrement Service							Females – Years of ERS Decrement Service						
Age	5	10	15	20	25	30	35	5	10	15	20	25	30	35
50						35	40						45	40
55					23	25	25					40	25	25
60	10	15	18	38	20	28	28	10	15	15	35	20	20	20
65	20	45	45	35	35	35	35	20	45	45	33	33	33	33
70	20	38	28	33	33	33	33	20	38	28	33	33	33	33
75	100	100	100	100	100	100	100	100	100	100	100	100	100	100

b) Active Regular Employee Class Members hired after August 31, 2009:
ERS Decrement Service is used to determine when the rates apply:

- Age 65 with 10 years of service
- Rule of 80 with 5 years of service

Sample rates for eligible members:

Annual Service Retirement Rates Per 100
Regular Employee Class Members Hired After August 31, 2009

	Males – Years of ERS Decrement Service							Females – Years of ERS Decrement Service						
Age	5	10	15	20	25	30	35	5	10	15	20	25	30	35
50						15	13						20	15
55					25	8	8					30	10	10
60				25	58	68	68				25	45	45	45
65		85	38	30	45	40	40		85	38	18	35	30	30
70		80	60	90	35	35	35		80	60	90	33	33	33
75	100	100	100	100	100	100	100	100	100	100	100	100	100	100

c) Active Elected Class Members:
ERS Decrement Service is used to determine when the rates apply:

- Age 60 with 8 years of service
- Rule of 50 with 12 years of service

Sample rates for eligible members:

Annual Service Retirement Rates Per 100
Elected Class Members

Age	Male and Female
50-64	10
65-74	20
75+	100

d) Active CPO/CO Employee Class Members hired before September 1, 2009:
CPO/CO Decrement Service is used to determine when the rates apply:

- Any age with 20 years CPO/CO service
- Age 55 with 10 years CPO/CO service

Sample rates for eligible members for both males and females:

Annual Service Retirement Rates Per 100 CPO/CO Employee Class Members Hired Before September 1, 2009

	Years of CPO/CO Decrement Service					
Age	5	10	15	20	25	30
45				5	5	5
50				45	55	55
55		12	12	45	35	35
60		16	16	55	35	35
65		35	35	50	60	60
70		50	50	50	50	50
75	100	100	100	100	100	100

e) Active CPO/CO Employee Class Members hired after August 31, 2009:
CPO/CO Decrement Service is used to determine when the rates apply:

- Any age with 20 years CPO/CO service
- Age 55 with 10 years CPO/CO service

Sample rates for eligible members for both males and females:

Annual Service Retirement Rates Per 100 CPO/CO Employee Class Members Hired After August 31, 2009

	Years of CPO/CO Decrement Service					
Age	5	10	15	20	25	30
45				5	5	5
50				5	5	5
55		12	12	83	65	65
60		16	16	55	35	35
65		35	35	50	60	60
70		50	50	50	50	50
75	100	100	100	100	100	100

f) JRS Members:
JRS I and II Decrement Service is used to determine when the rates apply:

- Age 65 with 10 years of service, if member currently holding judicial office.
- Age 65 with 12 years of service.
- 20 years of service.
- Age plus service equal to or greater than 70, if member has at least 12 years of service on an appellate court.

Sample rates for eligible members:

Annual Service Retirement Rates Per 100 Members	
Age	
50-69	20
70-74	25
75+	100

ii. Higher Education Members (assumptions used in valuing the TRS retirement plan)

	Early Retirement			Normal Retirement	
	Annual Service Retirement Rates Per 100 Members			Annual Service Retirement Rates Per 100 Members	
Age	Male	Female	Age	Male	Female
45	1	1	50	13	30
46	1	1	51	13	12
47	1	2	52	13	13
48	2	3	53	13	14
49	3	4	54	14	15
50	1	1	55	15	16
51	1	1	56	16	17
52	1	1	57	17	18
53	1	1	58	18	19
54	1	1	59	18	20
55	1	1	60	22	21
56	1	1	61	20	22
57	1	1	62	24	23
58	1	1	63	20	23
59	1	2	64	20	23
60	2	2	65	22	23
61	2	2	66	22	23
62	5	4	67	22	23
63	5	5	68	22	23
64	6	6	69	22	23
65	5	5	70	22	23
			71	22	23
			72	22	23
			73	22	23
			74	22	23
			75	100	100

For members hired after August 31, 2007 and who are vested as of August 31, 2014, the retirement rates for members once they reach unreduced retirement eligibility at age 60 are increased 10% for each year the member is beyond the Rule of 80 (i.e., if the member reached the Rule of 80 at age 58, then the probability of retirement at age 60 is 120% of the rate shown above).

For members hired after August 31, 2007 and who are not vested as of August 31, 2014, or, for members hired after August 31, 2014, the retirement rates for members once they reach unreduced retirement eligibility at age 62 are increased 10% for each year the member is beyond the Rule of 80 (i.e., if the member reached the Rule of 80 at age 58, then the probability of retirement at age 62 is 140% of the rate shown above).

Non-grandfathered members who receive a reduced benefit upon attaining Rule of 80 but prior to normal retirement age have a 1% probability of retirement.

c. **Disability Retirement**: Active members are expected to become disabled as defined under the plan in accordance with annual rates as illustrated below.

i. State Agency Members (assumptions used in valuing the applicable ERS retirement plan)

ERS Decrement Service is used to determine when the rates apply:

- The rates do not apply before member is eligible for the benefit.
- Service greater than zero is required for occupational disability retirement.
- For Regular, CPO/CO, and JRS I members, 10 years of service is required for non-occupational disability retirement.
- For JRS II members, 7 years of service is required for non-occupational disability retirement.
- For Elected Class members, 8 years of service is required for non-occupational disability retirement.
- Regular Class and JRS II Members are not eligible for non-occupational disability retirement if they are eligible for service retirement under the Rule of 80. Members who suffer a non-occupational disability after satisfying the Rule of 80 are therefore assumed to retire on service retirement.
- JRS I Members are not eligible for non-occupational disability retirement if they are eligible for service retirement under the Rule of 70. Members who suffer a non-occupational disability after satisfying the Rule of 70 are therefore assumed to retire on service retirement.
- Elected Class Members are not eligible for non-occupational disability retirement if they are eligible for service retirement (age 60 with 8 years of service; or age 50 with 12 years of service). Members who suffer a non-occupational disability after becoming eligible for service retirement are therefore assumed to retire on service retirement.
- CPO/CO Members are not eligible for non-occupational disability retirement if they are eligible for service retirement under the Rule of 80, or under the age 55 with at least 10 years of CPO/CO service provisions.

- For a member with 20 years CPO/CO service the combined ERS/LECO service retirement annuity is much greater than the ERS non-occupational disability retirement annuity. Therefore, the rates of non-occupational disability retirement are zero for members with 20 years of CPO/CO service.

Annual Disability Retirement Rates Per 100 Members

	Regular Class[1], Elected Class, JRS		CPO/CO Class[2]
Age	Male	Females	Males/Females
25	0.0006	0.0006	0.0003
30	0.0366	0.0180	0.0123
35	0.0867	0.0589	0.0418
40	0.0999	0.1195	0.0781
45	0.1369	0.1940	0.1307
50	0.1979	0.2762	0.2365
55	0.3302	0.4651	0.3280
60	0.4986	0.7444	0.4200

[1] 99% of all disabilities are assumed to be non-occupational and 1% are assumed to be occupational. No occupational disabilities are assumed for JRS I, JRS II or the Elected classes.

[2] 95% of all disabilities are assumed to be non-occupational, 4% are assumed to be occupational but not total disability, and 1% are assumed to be occupational and total disability.

ii. Higher Education Members (assumptions used in valuing the TRS retirement plan)

Annual Disability Retirement Rates Per 100 Members

	Years of Service < 10		Years of Service >= 10	
Age	Male	Female	Male	Female
20	0.0037	0.0055	0.0184	0.0276
30	0.0037	0.0055	0.0184	0.0276
40	0.0086	0.0094	0.0430	0.0469
50	0.0399	0.0363	0.1993	0.1817
55	0.0573	0.0493	0.2866	0.2465
60	0.0701	0.0551	0.3505	0.2754
65	0.0740	0.0551	0.3699	0.2754
70	0.0740	0.0551	0.3699	0.2754

d. **Termination**: The active members are assumed to terminate their employment for causes other than death, disability or retirement in accordance with annual rates as illustrated below.

i. State Agency Members (assumptions used in valuing the applicable ERS retirement plan)

a) Regular Class Members hired before September 1, 2009:
Graded Tables Based on ERS Experience.

Sample rates for members not eligible for service retirement:

Annual Rates of Termination Per 100 Regular Employee Class Members Hired Before September 1, 2009*

Attained	Male and Females – Years of ERS Decrement Service								
Age	0	1	2	3	4	5	10	15	20+
20	50	40	30	30	30	30			
25	35	30	26	22	20	15	15		
30	28	23	19	15	14	12	6	6	
35	27	21	16	14	11	10	6	3	3
40	25	18	13	11	10	9	6	3	3
45	25	18	13	11	9	8	4	3	1
50	22	17	13	10	9	7	4	2	1
55	21	15	11	9	7	7	4	2	1
60	20	15	10	8	7	6	4	2	1

b) Regular Class Members hired after August 31, 2009:
Graded Tables Based on ERS Experience.

Sample rates for members not eligible for service retirement:

Annual Rates of Termination Per 100 Regular Employee Class Members Hired After August 31, 2009*

Attained	Male and Females – Years of ERS Decrement Service								
Age	0	1	2	3	4	5	10	15	20+
20	52	42	32	27	27	27			
25	42	32	29	25	22	18	18		
30	32	27	21	18	15	14	6	6	
35	31	25	19	16	12	11	6	4	4
40	30	21	15	13	11	9	6	2	2
45	27	21	13	12	10	8	4	2	1
50	26	19	13	11	10	7	4	2	1
55	25	17	12	10	7	7	4	2	1
60	24	17	11	9	6	6	4	1	1
65	22	16	10	6	6	6	4	1	1

* Rates of termination are zero for members eligible for service retirement.

c) CPO/CO Class Members hired before September 1, 2009:

Annual Rates of Termination Per 100 CPO/CO Employee Class Members Hired Before September 1, 2009*

Attained	Male and Females – Years of ERS Decrement Service							
Age	0	1	2	3	4	5	10	15
20	23	19	17	17	17	17		
25	20	17	14	14	14	13		
30	16	13	12	11	10	10	8	8
35	16	11	9	9	8	7	6	4
40	14	10	8	7	7	7	5	2
45	13	10	7	6	6	6	3	2
50	12	9	7	6	6	6	3	2
55	12	7	5	5	4	4	1	1
60	13	7	5	5	4	4	1	1

d) CPO/CO Class Members hired after August 31, 2009:

Annual Rates of Termination Per 100 CPO/CO Employee Class Members Hired After August 31, 2009*

Attained	Male and Females – Years of ERS Decrement Service							
Age	0	1	2	3	4	5	10	15
20	24	20	17	17	17	17		
25	22	19	16	16	16	15		
30	17	15	14	12	12	12	8	8
35	18	12	11	11	10	8	6	4
40	15	11	9	8	8	8	5	2
45	14	11	8	7	7	7	3	2
50	13	11	8	7	7	6	3	2
55	13	8	5	5	4	4	1	1
60	15	8	5	5	4	4	1	1
65	15	8	5	5	4	4	1	1

* Rates of termination are zero for members eligible for service retirement.

e) Elected ERS Members:

Four per 100 for members not eligible for service retirement.

f) JRS I and II Members:

Four per 100 for members not eligible for service retirement.

ii. Higher Education Members (assumptions used in valuing the TRS retirement plan)

a) Select Period:

Rate of Decrement Due to Termination Per 100 Members Based on First 10 Years of Service

Years of Service	Male	Female
1	14.9027	14.3098
2	11.9756	11.7329
3	9.6637	9.7896
4	7.2275	7.6765
5	6.2453	6.8443
6	5.5556	6.0368
7	4.7176	4.9631
8	4.1464	4.3108
9	3.6978	3.8477
10	3.3777	3.5264

b) Ultimate Rates after the first 10 Years of Service:

Rate of Decrement Due to Termination Per 100 Members Based on Years from Normal Retirement

Years from Normal Retirement	Male	Female	Years from Normal Retirement	Male	Female
1	1.2140	0.9500	17	2.4208	2.7793
2	1.4373	1.2353	18	2.4547	2.8402
3	1.5865	1.4405	19	2.4873	2.8990
4	1.7017	1.6064	20	2.5185	2.9559
5	1.7968	1.7481	21	2.5487	3.0110
6	1.8783	1.8731	22	2.5777	3.0646
7	1.9502	1.9858	23	2.6058	3.1166
8	2.0147	2.0888	24	2.6329	3.1673
9	2.0733	2.1842	25	2.6592	3.2166
10	2.1273	2.2731	26	2.6848	3.2648
11	2.1772	2.3567	27	2.7096	3.3118
12	2.2239	2.4357	28	2.7337	3.3578
13	2.2676	2.5107	29	2.7571	3.4027
14	2.3090	2.5822	30	2.7800	3.4467
15	2.3481	2.6506	31	2.8023	3.4898
16	2.3853	2.7162	32	2.8241	3.5320

e. **Withdrawal of Contribution**:

i. State Agency Members (assumptions used in valuing the applicable ERS retirement plan)

Annual Rates of Withdrawal of Employee Contributions Per 100 New Vested Terminations Male and Female

	Regular Employee Class ERS Decrement Service				CPO/CO Employee Class ERS Decrement Service				Elected Class Members and JRS*			
Age	5-10	10-15	15-20	20+	5-10	10-15	15-20	20+	5-10	10-15	15-20	20+
20-24	100	100			100							
25-29	75	65	60		75	60	60					
30-34	65	60	50		75	60	50					
35-39	65	50	50	35	70	60	50					
40-44	65	50	45	35	70	60	50					
45-49	60	45	35	25	60	40	20					
50-54	55	40	30	20	55	40	20					
55+	50	30	25	15	50	30	20					

* Elected Class and JRS Members are assumed not to withdraw employee contributions.

100% of Non-vested terminations are assumed to withdraw their employee contributions.

ii. Higher Education Members

Members eligible to receive a deferred annuity are assumed to withdraw their contributions in accordance with the rates illustrated below.

Annual Rates of Withdrawal
of Employee Contributions per 100 New
Vested Terminations Male and Female

	Years of Service			
Age	5-10	10-15	15-20	20+
20-24	100	100		
25-34	80	80	60	
35-44	50	40	30	25
45-54	28	28	25	18
55+	0	0	0	0

f. **Salary Increases**: Increases are assumed to occur at the beginning of the valuation year and vary by employee group. The components of the annual increases are:

i. State Agency Members (assumptions used in valuing the applicable ERS retirement plan)

Employee Group	Inflation	Real Wage Growth (Productivity)	Merit, Promotion and Longevity
Legislators	0%	0%	0%
Elected Class (other than Legislators)	3.5%	0%	0%
Regular Employee Class	3.5%	0%	See sample rates
CPO/CO Class	3.5%	0%	See sample rates
JRS I & II	3.5%	0%	0%

a) Regular Employee Class: Merit, Promotion and Longevity Sample Rates:

Annual Salary Increases for Merit, Promotion and Longevity
Male and Female Regular Employee Class Members

	Years of ERS Decrement Service						
Age	0	1	2-4	5-9	10-14	15-19	20+
20	6.80%	5.25%	4.75%	4.30%			
25	6.40	5.25	4.75	3.50	2.50%		
30	5.90	5.25	4.75	3.00	2.50	2.00%	
35	5.40	4.75	4.00	3.00	2.50	2.00	1.90%
40	4.90	4.75	4.00	3.00	2.50	1.90	1.80
45	4.40	4.25	3.75	3.00	2.40	1.90	1.70
50	3.90	3.70	3.20	2.70	2.20	1.70	1.60
55	3.40	3.20	2.80	2.40	1.90	1.60	1.50
60	2.90	2.70	2.30	2.00	1.60	1.40	1.30

b) CPO/CO Employee Class: Merit, Promotion and Longevity Sample Rates:

Annual Salary Increases for Merit, Promotion and Longevity
Male and Female CPO/CO Employee Class Members

	Years of ERS Decrement Service						
Age	0	1	2	3	4	5-9	10+
All	8.0%	5.0%	4.5%	4.0%	3.5%	2.0%	1.5%

ii. Higher Education Members (assumptions used in valuing the TRS retirement plan)

Years of Service	Merit, Promotion, Longevity	General[1]	Total
1	6.0%	4.5%	10.5%
2	2.5	4.5	7.0
3	1.9	4.5	6.4
4	1.7	4.5	6.2
5	1.5	4.5	6.0
6	1.4	4.5	5.9
7	1.2	4.5	5.7
8-12	1.0	4.5	5.5
13	0.8	4.5	5.3
14	0.7	4.5	5.2
15	0.6	4.5	5.1
16-17	0.5	4.5	5.0
18	0.4	4.5	4.9
19-20	0.3	4.5	4.8
21-22	0.2	4.5	4.7
23-24	0.1	4.5	4.6
25 or more	0	4.5	4.5

[1] The inflationary component of this assumption varies from the inflation assumption used in the TRS retirement valuation in order to be consistent with all other inflation-related assumptions that are used in this report.

g. **Payroll Growth**: For purposes of total member projected payroll, payroll is assumed to increase 3.50% per year.

h. **Dependency Status**: Marital status and spouse/dependent children coverage elections in accordance with GBP records were used for current retired members.

For future retired members and their spouses:

i. a) State Agency Members
For Male members, female spouse is assumed to be 3 years younger. For Female members, male spouse is assumed to be the same age.

b) Higher Education Members
Female spouses are assumed to be 3 years younger than their male counterparts.

ii. 38% of the male members are assumed to be married and electing coverage for their spouse, and 21% of the female members are assumed to be married and electing coverage for their spouse.

iii. The proportion of future retirees covering dependent children is based upon the retiree's age at retirement as follows:

Age at Retirement	Percentage of Retirees Covering Dependent Children
<50	38%
50-54	34%
55-59	18%
60-64	8%
65-69	3%
>70	1%

iv. Current retirees covering dependent children are assumed to continue such coverage until the child reaches age 23. Future retirees who cover dependent children are expected to cover dependent children for a period of seven years on average.

v. 40% of current and future retiree spouses are assumed to continue health coverage for their lifetime after the death of the retiree. No dependent children are assumed to continue health coverage after the death of the retiree.

i. **Declinations**:

98% of future Service Retirees are assumed to elect health coverage at retirement and remain covered until death. The remaining 2% of future Service Retirees are expected to demonstrate outside health coverage and receive an Employer contribution towards certain other optional benefits (i.e., Opt-Out Credit).

100% of future retirees who decrement for causes other than Service Retirement (e.g., Disability and Termination–without account balance withdrawal) are assumed to elect health coverage at retirement and remain covered until death.

j. **HealthSelect Medicare Advantage Participation**:

i. For current retirees and retiree spouses eligible for participation in the HealthSelect Medicare Advantage Plan: based on actual election.

ii. For current retirees and retiree spouses not yet eligible for HealthSelect Medicare Advantage participation and for future retirees and retiree spouses: 69% are assumed to participate in HealthSelect Medicare Advantage at the earliest date at which coverage can commence under this program.

k. **Tobacco Usage**:

i. For current retirees and retiree spouses, tobacco usage is based on records of the System.

ii. 9.0% of future retirees are assumed to use tobacco, and 8.0% of future retiree spouses are assumed to use tobacco.

2. **Economic Assumptions**

a. **Administrative Expenses**: The expenses to administer the GBP health benefits are (i) $224.84 ($213.36 for medical plus $11.48 for prescription drugs) per year per covered member for external HealthSelect administrative expenses for FY 2017 and (ii) approximately $54.09 per year per covered member for internal administrative expenses for FY 2017 (including the ACA Patient-Centered Outcomes Research Institute (PCORI) fee). The external and internal administrative expenses per covered member are the same regardless of whether the member covers dependents. In addition, the ACA Transitional Reinsurance Program Fee on each non-Medicare Primary participant ($27 per year in 2016 (for 4 months) and $0 thereafter) is included in this valuation.

b. **Stop-loss Reinsurance:** Stop-loss reinsurance is not purchased for the GBP.

c. **Discount Rate**: Equal to the assumed return on assets of the Employer of 5.50%.

d. **Health Benefit Cost Trend**: The assumed Per Capita Health Benefit Cost assumptions shown in items 2.i., 2.j., and 2.k. below are assumed to increase at the rates shown below.

Fiscal Year	Annual Rate of Increase
2018	8.50%
2019	8.50%
2020	7.50%
2021	7.00%
2022	6.50%
2023	6.00%
2024 and beyond	5.50%

e. **Trend Rate for Retiree Contributions**: The portions of retiree contributions attributable to non-life insurance benefits for both HealthSelect and HealthSelect Medicare Advantage Plan are assumed to increase from their amounts in FY 2017 at the rates shown below.

Fiscal Year	Annual Rate of Increase*
2018	4.40%
2019	4.40%
2020	7.50%
2021	7.00%
2022	6.50%
2023	6.00%
2024 and beyond	5.50%

* The retiree contribution rates are assumed to increase at the same rate as the Health Benefit Cost Trend except for FY18 and FY19 for which the increase is limited in accordance with the increase included in the Legislative Appropriation Request.

f. **Expense Trend Rate**: Internal and external administrative expenses are assumed to increase 3.50% per annum.

g. **Trend Rate for the Opt-Out Credit**: The monthly benefit of $60 in FY 2017 is not assumed to increase in the future.

h. **Health Coverage by Governmental Plans**: There has been no consideration of anticipated changes in laws concerning health costs covered by governmental programs. However, presently enacted changes in the law that take effect in future periods that will affect future benefit coverages are considered. The proportion of health benefits which are currently covered by governmental programs has been assumed to remain constant in the future.

i. **Assumed HealthSelect Per Capita Health Benefit Cost (Medical and Prescription Drugs) for Fiscal Year 2017 for Covered Retirees and Spouses* (reflects benefits in effect September 1, 2016)**

	Assumed Annual Claims Cost per Retiree			Assumed Annual Claims Cost per Retiree			Assumed Annual Claims Cost per Retiree	
Age	Male	Female	Age	Male	Female	Age	Male	Female
22	$ 2,315	$ 5,146	52	$ 7,704	$ 8,449	82	$ 4,778	$ 4,251
23	2,338	5,198	53	8,060	8,747	83	4,817	4,277
24	2,362	5,251	54	8,416	9,045	84	4,855	4,302
25	2,386	5,304	55	8,772	9,343	85	4,894	4,328
26	2,410	5,358	56	9,129	9,640	86	4,933	4,354
27	2,434	5,412	57	9,485	9,938	87	4,973	4,380
28	2,536	5,456	58	9,986	10,171	88	5,012	4,407
29	2,638	5,501	59	10,488	10,405	89	5,052	4,433
30	2,740	5,546	60	10,989	10,638	90	5,093	4,460
31	2,843	5,590	61	11,491	10,872	91	5,134	4,486
32	2,945	5,635	62	11,992	11,105	92	5,175	4,513
33	3,049	5,704	63	12,472	11,550	93	5,216	4,540
34	3,154	5,773	64	12,971	12,012	94	5,258	4,568
35	3,258	5,841	65	5,267	4,032	95	5,300	4,595
36	3,363	5,910	66	5,320	4,073	96	5,342	4,623
37	3,468	5,979	67	5,374	4,114	97	5,385	4,650
38	3,681	6,078	68	5,267	4,110	98	5,428	4,678
39	3,894	6,178	69	5,160	4,105	99	5,471	4,706
40	4,107	6,277	70	5,053	4,100	100	5,515	4,735
41	4,320	6,376	71	4,946	4,096	101	5,559	4,763
42	4,533	6,475	72	4,840	4,091	102	5,604	4,792
43	4,819	6,748	73	4,733	4,086	103	5,649	4,820
44	5,106	7,020	74	4,626	4,082	104	5,694	4,849
45	5,392	7,292	75	4,519	4,077	105	5,739	4,878
46	5,679	7,565	76	4,555	4,101	106	5,785	4,908
47	5,965	7,837	77	4,592	4,126	107	5,832	4,937
48	6,313	7,959	78	4,628	4,151	108	5,878	4,967
49	6,661	8,082	79	4,665	4,176	109	5,925	4,996
50	7,008	8,204	80	4,703	4,201	110	5,973	5,026
51	7,356	8,327	81	4,740	4,226			

* Spouses' per capita costs are assumed to be 127% of the amounts shown in this table.

j. **Assumed HealthSelect Medicare Advantage Plan Per Capita Health Benefit Cost (Medical and Prescription Drugs) for Fiscal Year 2017 for Covered Retirees and Spouses* (reflects benefits in effect September 1, 2016)**

	Assumed Annual Claims Cost per Retiree			Assumed Annual Claims Cost per Retiree	
Age	Male	Female	Age	Male	Female
65	$ 3,362	$ 3,372	88	$ 3,607	$ 3,486
66	3,377	3,386	89	3,621	3,496
67	3,392	3,402	90	3,635	3,505
68	3,398	3,397	91	3,649	3,515
69	3,404	3,393	92	3,663	3,525
70	3,410	3,389	93	3,677	3,535
71	3,415	3,384	94	3,691	3,544
72	3,421	3,380	95	3,706	3,554
73	3,427	3,376	96	3,720	3,564
74	3,433	3,371	97	3,735	3,574
75	3,438	3,367	98	3,749	3,584
76	3,451	3,376	99	3,764	3,595
77	3,463	3,385	100	3,779	3,605
78	3,476	3,394	101	3,794	3,615
79	3,488	3,403	102	3,810	3,625
80	3,501	3,412	103	3,825	3,636
81	3,514	3,421	104	3,840	3,646
82	3,527	3,430	105	3,856	3,657
83	3,540	3,439	106	3,872	3,667
84	3,553	3,448	107	3,888	3,678
85	3,567	3,458	108	3,904	3,689
86	3,580	3,467	109	3,920	3,700
87	3,593	3,477	110	3,936	3,710

* The prescription drug components of spouses' per capita costs are assumed to be 127% of the prescription drug amounts included in this table.

k. **Dependent Children: Assumed Per Capita Health Benefit Cost for Fiscal Year 2017 (reflects benefits in effect September 1, 2016)**:

$6,579 annual per capita benefit cost for each retiree covering dependent children irrespective of the number of children covered.

l. **Dental Benefits**: The present value of future expected dental benefits is assumed to be equal to the present value of future retiree contributions towards dental benefits.

m. **Vision Benefits**: The present value of future expected vision benefits is assumed to be equal to the present value of future retiree contributions towards vision benefits.

n. **Cost Sharing Provisions:** Deductibles, copayments and coinsurance levels and retiree contribution levels are assumed to increase at the same rate as the health benefit cost trend, consistent with the expected operation of the substantive plan (i.e., the proportion of non-Medicare expenses covered by the employer/employee is assumed to remain constant).

o. **General Price Inflation**: Both the health benefit cost trend and the discount rate include the same inflationary element attributable to changes in general price levels, 3.50%.

3. **Other Assumptions**

a. **Valuation Payroll**

Valuation Payroll (earnings applied to the current valuation year) is the payroll for the fiscal year ending on the valuation date. It is based on reported payroll determined from August member contributions.

b. **Missing Data**

i. Service for Non-ERS Members

Service for all employees who are not members of ERS (except as indicated in (ii) below) is determined as follows: (i) for employees hired before September 1, 2003, service is calculated as the elapsed time from original date of hire to the valuation date, and (ii) for employees hired after August 31, 2003, service is calculated as the elapsed time from completion of the waiting period to the valuation date.

ii. Pre-September 1, 1992 Higher Education Hires

Service for pre-September 1, 1992 Higher Education hires, whose date of hire was reported as September 1, 1992, is assumed to have the same service distribution as State Agency employees.

iii. ORP Vested Terminated Employees

Census data for vested terminated higher education employees participating in the ORP was not available at the time of this valuation. As a result, the ORP vested terminated employees liability is assumed to have the same ratio to the ORP retiree liability as the ratio of TRS vested terminated employee liability to the TRS retiree liability. In other words, the ORP retiree liability is multiplied by this TRS ratio to determine the ORP vested terminated liability. The estimated number of ORP vested terminated members is determined in the same manner.

c. **Demographic Assumptions for TMRS, TCDRS, TTA and CSCD**

Employees of Texas Municipal Retirement System, Texas County and District Retirement System, Texas Turnpike Authority and Community Supervision and Corrections Departments are assumed to exhibit the same demographic decrements as Regular Class ERS members.

d. **Eligibility Service Adjustments**

Eligibility Service at Service Retirement and Death-in-Service is assumed to be increased due to purchase of Additional Service Credits and/or Accumulated Sick and Annual Leave by:

i. 0 years for members retiring from the Elected Class;
ii. 2.0 years for members retiring from regular employee class service who were hired before September 1, 2009 if age plus service, prior to adjustment, are greater than or equal to 78;
iii. 1.0 year for members retiring from regular employee class service who were hired before September 1, 2009 if age plus service, prior to adjustment, are less than 78;
iv. 1.0 year for members retiring from regular employee class service who were hired after August 31, 2009;
v. 2.0 years for members retiring from CPO/CO class service who were hired before September 1, 2009 if service, prior to adjustment, is at least 18 years;
vi. 1.0 year for members retiring from CPO/CO class service who were hired before September 1, 2009 if service, prior to adjustment, is less than 18 years; and
vii. 1.0 year for members retiring from CPO/CO class service who were hired after August 31, 2009.

e. **Graduate Students**

Graduate students are excluded from this valuation because none of the graduate students are assumed to satisfy the eligibility criteria for benefits under this plan during the period of their employment as a graduate student.

4. **Changes in Assumptions**

a. **Demographic Assumptions**

The following assumptions have been updated since the previous valuation to reflect recent plan experience and expected trends:

- Percentage of current retirees and retiree spouses not yet eligible to participate in the HealthSelect Medicare Advantage Plan and future retirees and retiree spouses who will elect to participate in the plan at the earliest date at which coverage can commence.

- Proportion of future retirees covering dependent children.

- Percentage of future retirees and retiree spouses assumed to use tobacco.

b. **Economic Assumptions**

Assumptions for Administrative Expenses, Assumed Per Capita Health Benefit Costs and Health Benefit Cost and Retiree Contribution trends have been updated since the previous valuation to reflect recent health plan experience and its effects on our short-term expectations.

Minor benefit changes have been reflected in the FY 2017 Assumed Per Capita Health Benefit Costs.

Please see our previous valuation report dated November 3, 2015 for a complete list of our previous economic assumptions.

Section VIII - Outline of Principal Eligibility and Benefit Provisions

A. Plan Identification

1. Plan Name

   Other Post-Employment Benefits provided under the Texas Employees Group Benefits Program (GBP)

2. Plan Type

   The GBP is a cost-sharing multiple-employer defined benefit OPEB plan. Employers participating in the GBP include:

   a. the State of Texas which is the employer for all state agency employees and employees of senior colleges and universities,

   b. 50 Texas junior and community colleges,

   c. the Texas Municipal Retirement System, Texas County and District Retirement System and the Texas Turnpike Authority,

   d. Community Supervision and Corrections Departments.

3. Contributions and Reserves

   a. The authority under which the obligations of the plan members and Employer are established and or may be amended is Chapter 1551, Texas Insurance Code.

   b. The Employer and member contribution rates are determined annually by the ERS Board Trustees based on the recommendations of the ERS staff and consulting actuary. The contribution rates are determined based on (i) the benefit and administrative costs expected to be incurred, (ii) the funds appropriated and (iii) the funding policy established by the Texas Legislature in connection with benefits provided through the GBP. The Trustees revise benefits when necessary to match expected benefit and administrative costs with the revenue expected to be generated by the appropriated funds.

   c. There are no long-term contracts for contributions to the plan.

B. Employee Classification Requirements for Future Benefit Eligibility

State agency and higher education employees must meet the following classification requirements in order to be eligible for OPEB provided they also meet the age and service conditions described in item C. below.

1. State Agency or Higher Education Employee

   An individual must be an elected or appointed officer or employee who performs service (other than an independent contractor) for the State of Texas, including an institution of higher education, other than the University of Texas or Texas A&M University Systems, and who:

   a. receives compensation for the service performed pursuant to a payroll certified by a state agency or by an elected or appointed officer, or

   b. receives compensation for service performed for an institution of higher education pursuant to a payroll certified by an institution of higher education or by an elected or appointed officer of the State.

2. Employees of Certain Other Entities

   a. Officers or employees of Texas Municipal Retirement System or Texas County and District Retirement System

   b. Certain employees or officers of the Texas Turnpike Authority

   c. Employees of the Community Supervision and Corrections Departments

C. Eligibility for OPEB

The employee's eligibility for GBP OPEB is dependent upon the event which initiates the employee's severance from employment.

Event	GBP OPEB Eligibility			
	At Least			Commencement of GBP Benefits
1. Service Retirement or Death	Age	Service	Age + Service	Age
a. ERS - Regular Class	60	10		65
	or	10	80	Immediately upon Retirement
b. ERS - CPO/CO	55	10		Immediately upon Retirement
	or	20		Immediately upon Retirement
	or	10	80	Immediately upon Retirement
c. ERS - Elected Class	60	8		Immediately upon Retirement
	or 50	12		Immediately upon Retirement
d. TRS (Higher Education)	55	10		65
	or	30		65
	or	10	80	Immediately upon Retirement
e. ORP (Higher Education)		10	80	Immediately upon Retirement
f. JRS I and II	60	10*		Immediately upon Retirement
	or	20		Immediately upon Retirement
	or	12**	70	Immediately upon Retirement

* 10 years required if holding a judicial office at the time of retirement; otherwise 12 years.
** 12 years of service on an appellate court.

Event	GBP OPEB Eligibility			
	At Least			Commencement of GBP Benefits
2. Disability	Age	Service	Age + Service	Age
a. ERS - Regular Class		10*		Immediately upon Disability
b. ERS - CPO/CO		10*		Immediately upon Disability
c. ERS - Elected Class		8*		Immediately upon Disability
d. TRS (Higher Education)		10		Immediately upon Disability
e. ORP (Higher Education)		10		Immediately upon Disability
f. JRS I and II		7		Immediately upon Disability

* Service Requirement is waived if the disability is an occupational disability.

3. Termination

   a. Same Age/Service/Age+Service requirements as Service Retirement in item 2.a. above, provided at the time of termination the employee has at least:

      1. 10 service years for Regular, CPO/CO, TRS and ORP classes
      2. 8 service years for Elected class members
      3. 12 service years for the JRS I and II classes

   b. Only eligible for benefits at commencement age if employee contributions are not withdrawn prior to commencement age.

D. Post-Employment Health Benefits

1. For purposes of the valuation, all retirees, including those presently enrolled in HMOs, are assumed to have GBP health coverage under HealthSelect (unless they elect or are assumed to elect the HealthSelect Medicare Advantage Plan for Medicare-primary years of coverage), a self-funded health plan providing medical and prescription drug coverage. (See chart at end of this section for details.) We have adopted this assumption due to the small number of retirees enrolled in HMOs and the similarity between the cost of HealthSelect and HMO coverage.
2. For benefit years prior to the date on which Medicare becomes primary, HealthSelect (Medical and Prescription Drug) is primary. (See chart at end of this section for details.)
3. For benefit years after the date on which Medicare becomes primary:
   a. For retirees and spouses participating in HealthSelect:
      (i) HealthSelect medical coverage is secondary to Medicare (secondary via Coordination of Benefits method) (See chart at end of this section for details.)
      (ii) HealthSelect prescription drug coverage remains primary.
   b. For retirees and spouses participating in the HealthSelect Medicare Advantage Plan:
      (i) HealthSelect Medicare Advantage Plan medical coverage is provided in lieu of Medicare and HealthSelect medical coverage. (See chart at end of this section for details.)
      (ii) HealthSelect prescription drug coverage remains primary.
4. Covered Retirees are eligible for coverage until death.
5. Retiree Spouses may be covered until death provided the applicable monthly contribution is paid on behalf of the covered spouse.
6. Dependent Children may be covered provided the applicable monthly contribution is paid on behalf of the dependent children.
   a. Coverage ceases when the child reaches age 26 or when the child marries, if earlier. However, a child who is mentally retarded or physically incapacitated may continue coverage beyond age 26 provided such child remains a dependent of the retired member.
   b. The term child includes an adopted child, a foster child, a stepchild or other child in a parent-child relationship.

E. Post-Employment Life Insurance Coverage

1. Retirees participating in GBP health coverage are eligible for $2,500 life insurance coverage funded by the Employer.
2. Retirees who opt-out of health coverage are not eligible for Employer-funded life insurance.
3. Employer-funded life insurance coverage is not available for spouses or other dependent children.

F. Opt-Out Credit

Applicable to certain optional benefits for retirees who opt out of GBP health coverage provided they demonstrate that they have health coverage outside of the GBP.

1. Retirees who opt out of the GBP health benefits are eligible.
2. Opt-Out credit is up to $60 per month for full-time retirees and $30 per month for part-time retirees. Retirees may use the credit only to purchase dental coverage.
3. The retiree qualifies for a $60 credit without regard to whether the retiree has a spouse or dependent children.

G. Other Optional Benefits Available at Cost to Eligible Retirees

1. Dental Options
   a. State of Texas Dental Choice Plan
   b. Dental HMO
2. Optional Group Term Life Insurance with a face value of $10,000 or up to two times salary.
3. Optional Dependent Group Term Life Insurance with a face value of $2,500.
4. State of Texas Vision Plan

H. Retiree Contributions

1. Health Coverage
   a. HealthSelect

   Annually, ERS determines the uniform contribution rates for members participating in HealthSelect. The monthly member contribution rates for FY17 are:

	100% State Contributions Current Retirees and Future Retirees with 5+ YOS on September 1, 2014[1]		Future Retirees with Fewer than 5 YOS on September 1, 2014					
			50% State Contributions Less than 15 YOS at Retirement[2]		**75% State Contributions** At least 15 YOS but less than 20 YOS at Retirement[3]		**100% State Contributions** 20+ YOS at Retirement[4]	
	Full-Time	Part-Time	Full-Time	Part-Time	Full-Time	Part-Time	Full-Time	Part-Time
Member	$ 0.00	$ 307.54	$ 307.54	$ 461.31	$ 153.77	$ 384.43	$ 0.00	$ 307.54
Member plus Spouse	$ 353.68	$ 838.06	$ 838.06	$ 1,080.25	$ 595.87	$ 959.16	$ 353.68	$ 838.06
Spouse, if Retiree is deceased	$ 707.36	$ 707.36	$ 707.36	$ 707.36	$ 707.36	$ 707.36	$ 707.36	$ 707.36
Member plus Dependent Children	$ 236.80	$ 662.74	$ 662.74	$ 875.71	$ 449.77	$ 769.23	$ 236.80	$ 662.74
Dependent Children, if Retiree is deceased	$ 473.60	$ 473.60	$ 473.60	$ 473.60	$ 473.60	$ 473.60	$ 473.60	$ 473.60
Member plus Family, if Retiree is alive	$ 590.48	$ 1,193.26	$ 1,193.26	$ 1,494.65	$ 891.87	$ 1,343.96	$ 590.48	$ 1,193.26
Spouse plus Children, if Retiree is deceased	$ 1,180.96	$ 1,180.96	$ 1,180.96	$ 1,180.96	$ 1,180.96	$ 1,180.96	$ 1,180.96	$ 1,180.96

[1] Actual Retiree Contribution Rates for FY17. Tobacco users pay an additional $30 per month. These rates will also apply to ERS - Elected Class members, JRS I and II members, and disabled members from any class, irrespective of those members' YOS at September 1, 2014.

[2] Hypothetical Retiree Contribution Rates for FY17. Tobacco users pay an additional $30 per month. These rates (adjusted for post-FY17 increases) will not be used until FY19 since that will be the first time an employee with less than 5 YOS on September 1, 2014 could retire with 10 YOS. These rates will not apply to ERS-Elected Class members, JRS I and II members or disabled members from any class, irrespective of those members' YOS at September 1, 2014.

[3] Hypothetical Retiree Contribution Rates for FY17. Tobacco users pay an additional $30 per month. These rates (adjusted for post-FY17 increases) will not be used until FY24, since that will be the first time an employee with less than 5 YOS on September 1, 2014 could retire with 15 YOS. These rates will not apply to ERS-Elected Class members, JRS I and II members or disabled members from any class, irrespective of those members' YOS at September 1, 2014.

[4] Hypothetical Retiree Contribution Rates for FY17. Tobacco users pay an additional $30 per month. These rates (adjusted for post-FY17 increases) will not be used until FY29, since that will be the first time an employee with less than 5 YOS on September 1, 2014 could retire with 20 YOS. These rates will not apply to ERS-Elected Class members, JRS I and II members or disabled members from any class, irrespective of those members' YOS at September 1, 2014.

b. HealthSelect Medicare Advantage Plan

Annually, ERS determines the uniform contribution rates for members participating in the HealthSelect Medicare Advantage Plan option. The monthly member contribution rates for calendar year 2017 are:

	100% State Contributions Current Retirees and Future Retirees with 5+ YOS on September 1, 2014[1]		Future Retirees with Fewer than 5 YOS on September 1, 2014					
			50% State Contributions Less than 15 YOS at Retirement[2]		**75% State Contributions** At least 15 YOS but less than 20 YOS at Retirement[3]		**100% State Contributions** 20+ YOS at Retirement[4]	
	Full-Time	Part-Time	Full-Time	Part-Time	Full-Time	Part-Time	Full-Time	Part-Time
Member	$ 0.00	$ 157.08	$ 157.08	$ 235.62	$ 78.54	$ 196.35	$ 0.00	$ 157.08
Member plus Spouse	$ 157.08	$ 392.70	$ 392.70	$ 510.51	$ 274.89	$ 451.61	$ 157.08	$ 392.70
Spouse, if Retiree is deceased	$ 314.16	$ 314.16	$ 314.16	$ 314.16	$ 314.16	$ 314.16	$ 314.16	$ 314.16
Member plus Dependent Children	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dependent Children, if Retiree is deceased	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Member plus Family, if Retiree is alive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spouse plus Children, if Retiree is deceased	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

2. Annually, ERS determines the retiree contribution rate for basic life insurance. The monthly member contribution rates for FY17 are:

Basic Life Insurance ($2,500 of Coverage) for	All Retirees Except Part-time Retirees	Part-time Retirees
Retiree	$ 0	$ 1.11

[1] Actual Retiree Contribution Rates for CY17. Tobacco users pay an additional $30 per month. These rates will also apply to ERS - Elected Class members, JRS I and II members, and disabled members from any class, irrespective of those members' YOS at September 1, 2014.

[2] Hypothetical Retiree Contribution Rates for CY17. Tobacco users pay an additional $30 per month. These rates (adjusted for post-CY17 increases) will not be used until FY19 since that will be the first time an employee with less than 5 YOS on September 1, 2014 could retire with 10 YOS. These rates will not apply to ERS-Elected Class members, JRS I and II members or disabled members from any class, irrespective of those members' YOS at September 1, 2014.

[3] Hypothetical Retiree Contribution Rates for CY17. Tobacco users pay an additional $30 per month. These rates (adjusted for post-CY17 increases) will not be used until FY24, since that will be the first time an employee with less than 5 YOS on September 1, 2014 could retire with 15 YOS. These rates will not apply to ERS-Elected Class members, JRS I and II members or disabled members from any class, irrespective of those members' YOS at September 1, 2014.

[4] Hypothetical Retiree Contribution Rates for CY17. Tobacco users pay an additional $30 per month. These rates (adjusted for post-CY17 increases) will not be used until FY29, since that will be the first time an employee with less than 5 YOS on September 1, 2014 could retire with 20 YOS. These rates will not apply to ERS-Elected Class members, JRS I and II members or disabled members from any class, irrespective of those members' YOS at September 1, 2014.

I. Funding Mechanism

1. HealthSelect Medical and Prescription Drug benefits are self-funded. Medical benefits under the HealthSelect Medicare Advantage Plan are fully insured.
2. Basic Life Insurance benefits are fully insured under a minimum premium funding arrangement.
3. Dental
   a. State of Texas Dental Choice Plan is self-funded through contributions made by employees and retirees.
   b. Dental HMO is fully insured through contributions made by employees and retirees.
   c. The State does not contribute toward dental coverage.
4. Optional Group Term Life Insurance and Dependent Group Term Life Insurance are fully insured under a minimum premium funding arrangement. Such coverages are fully funded by employee and retiree contributions. The State does not contribute toward these coverages.
5. Vision
   a. State of Texas Vision Plan is self-funded through contributions made by employees and retirees.
   b. The State does not contribute toward vision coverage.

J. Health Benefits Chart Out-of-Pocket Expenses in effect September 1, 2016

1. Medical Benefits
   a. HealthSelect (Non-Medicare primary)

Benefits	HealthSelect℠ of Texas[1]			Consumer Directed HealthSelect℠[1]		HMOs	
	In-Area		Out-of-Area[2]	In-Area		Community First, Scott & White	KelseyCare powered by Community Health Choice
	Network	Non-Network		Network	Non-Network		
Calendar year deductible	None	$500 per person $1,500 per family	$200 per person $600 per family	$2,100 per person $4,200 per family	$4,200 per person $8,400 per family	None	None
Out-of-pocket coinsurance maximum[4]	$2,000 per person per calendar year	$7,000 per person per calendar year	$3,000 per person per calendar year	None	None	$2,000 per person[3]	$2,000 per person[3]
Total out-of-pocket maximum[9] (including deductibles, coinsurance and copays)[11]	**$6,550 per person $13,100 per family	None	**$6,550 per person $13,100 per family	**$6,550 per person $13,100 per family	**$13,100 per person $26,200 per family	$6,550 per person $13,100 per family[3]	$6,550 per person $13,100 per family[3]
Primary care physician required	Yes	No	No	No	No	Contact your HMO	No
Primary care physicians' office visits	$25	40%	30%	20%	40%	$25	$15
Mental health office visits	$25	40%	30%	20%	40%	$25	$25
Physicals*	No charge	40%	Network provider - No charge; Non-network provider - 30%	No charge	40%	No charge	No charge
Specialty physicians' office visits	$40	40%	30%	20%	40%	$40	$25
Routine eye exam, one per year per participant*	$40	40%	30%	20%	40%	$40[10]	$25[2]
Routine preventive care*	No charge	40%	Network provider - No charge; Non-network provider - 30%	No charge	40%	No charge	No charge
Diagnostic x-rays, lab tests, and mammography	20%	40%	30%	20%	40%	20%	No charge* (physician office)
Office surgery and diagnostic procedures	20%	40%	30%	20%	40%	20%	$15 PCP or $25 Specialist
High-tech radiology (CT scan, MRI, and nuclear medicine)[7,8,12]	$100 copay plus 20%	$100 copay plus 40%	$100 copay plus 30%	20%	40%	$100 copay plus 20% coinsurance	$150 copay per scan type per day (Outpatient testing only)
Urgent care clinic	$50 copay plus 20%	$50 copay plus 40%	30%	20%	40%	$50 copay plus 20%	$50 copay plus 20%
Maternity Care doctor charges only*; inpatient hospital copays will apply	No charge for routine prenatal appointments $25 or $40 for first post-natal visit[5]	40%	30%	No charge for routine prenatal appointments 20% for first post-natal visit	40%	No charge for routine prenatal appointments $25 or $40 for first post-natal visit[5]	No charge

See footnotes on following page.

Benefits	HealthSelect℠ of Texas[1]			Consumer Directed HealthSelect℠[1]		HMOs	
	In-Area		Out-of-Area	In-Area		Community First, Scott & White	KelseyCare powered by Community Health Choice
	Network	Non-Network		Network	Non-Network		
Chiropractic Care							
a. Co-insurance	20%,$40 copay plus 20% with office visit	40%	30%	20%	40%	CFHP: 20%, $40 copay SWHP: 20%; $40 copay plus 20% with office visit	$25 copay
b. Maximum benefit per visit	$75	$75	$75	$75	$75	CFHP-$75/ SWHP - None	–
c. Maximum visits Each participant Per calendar year	30	30	30	30	30	CFHP-30; SWHP-35 (maximum manipulative therapy visits)	30
Inpatient hospital (semi-private room and day's board, and intensive care unit)[12]	$150/day copay plus 20% ($750 copay max-up to 5 days per hospital stay, $2,250 copay max per calendar year per person)	$150/day copay plus 40% ($750 copay max-up to 5 days per hospital stay, $2,250 copay max per calendar year per person)	$150/day copay plus 30% ($750 copay max-up to 5 days per hospital stay, $2,250 copay max per calendar year per person)	20%	40%	$150/day copay plus 20% ($750 copay max-up to 5 days per hospital stay, $2,250 copay max per plan year per person[3])	$150/day copay plus 20% ($750 copay max-up to 5 days per hospital stay, $2,250 copay max per plan year per person)
Emergency care	$150 plus 20% (if admitted copay will apply to hospital copay)	$150 plus 20% (if admitted copay will apply to hospital copay)	30%	20%	20%	$150 plus 20% (if admitted copay will apply to hospital copay)	$150 copay plus 20% (if admitted copay will apply to hospital copay)
Outpatient surgery other than in physician's office	$100 copay plus 20%	$100 copay plus 40%	$100 copay plus 30%	20%	40%	$100 copay plus 20%	$150
Bariatric surgery[8, 9A, 12]	a. Deductible $5,000 b. Coinsurance 20% c. Lifetime max $13,000	Not covered	a. Deductible $5,000 b. Coinsurance 20% c. Lifetime max $13,000	Not covered	Not covered	Not covered	Not covered
Hearing aids	Plan pays up to $1,000 per ear every three years (no deductible).			Plan pays up to $1,000 per ear every three years (after deductible is met).		Plan pays up to $1,000 per ear every three years (no deductible).	
Durable medical equipment[12]	20%	40%	30%	20%	40%	20%	20%
Ambulance services (non-emergency)[12]	20%	20%	30%	20%	20%	20%	20%

[1] Benefits are paid on allowable amounts; using providers who contract with United-healthcare will protect you from liability for amounts over the allowable amount.
[2] Out-of-area applies to participants living outside of Texas, retirees 65 and over, and disabled retirees with Medicare.
[3] Applies to plan year, September 1 - August 31.
[4] Does not include copays.
[5] Copay depends on whether treatment is given by PCP or specialist.
[6] For treatment charges, one visit per plan year.
[7] Outpatient testing only. Does not apply to inpatient services.
[8] Active employees only; see health plan for additional requirements/limitations.
[9A] The deductible and coinsurance paid for bariatric surgery does not apply to the total out-of-pocket maximum.
[9] No copay if high-tech radiology is performed during ER visit or inpatient admission.
[10] Out-of-pocket maximums are not mutually exclusive from other out-of-pocket limits. This means that a participant's total network out-of-pocket maximum could contain a combination of coinsurance and/or copayments. (For example, a participant could pay up to $6,550 in copayments alone if there was no coinsurance paid throughout the year. If a participant met the $2,000 coinsurance out-of-pocket maximum, he/she would pay $4,550 in copayments, totaling $6,550 in overall out-of-pocket expense.)
[11] Includes medical and prescription drug copays, coinsurance and deductibles. Excludes non-network and bariatric services.
[12] Preauthorization required

b. HealthSelect (Medicare primary) and HealthSelect Medicare Advantage Plan (Medicare primary)

Benefit	Original Medicare[4] (Medicare rates are subject to change)	HealthSelect Medicare Advantage Plan[5,6] (No coordination with Medicare is necessary)	Medicare Primary, HealthSelect Secondary (HealthSelect and Medicare coordinate benefits for you.)	Medicare Primary, GBP HMO Secondary (GBP HMO plans coordinate benefits with Medicare for you)		KelseyCare Advantage HMO (No coordination with Medicare is necessary)
				Community First, Scott & White	KelseyCare powered by Community	
Calendar year deductible	$147	None	$200 per individual $600 per family	None	None	None
Office visits in conjunction with an illness or injury	20%	$0	$0[1] copay / 30%[7] coinsurance	$0 copay / $25[7] copay	$0 copay / $15[7] copay	$0
Specialty physician office visit	20%	$0	$0[1] copay / 30%[7] coinsurance	$0 copay / $40[7] copay	$0 copay / $25[7] copay	$0
Diagnostic tests and x-rays, including allergy testing	20%	$0	$0[1] copay / 30%[7] coinsurance	$0 copay / 20%[7] coinsurance	$0 copay for diagnostic tests / x-rays. Allergy testing: $15 PCP or $25 specialist copay[6,7]	$0
Diagnostic mammography	$0	$0	$0[1] copay / 30%[7] coinsurance	$0 copay / 20%[7] coinsurance	$0 copay[7]	$0
Diagnostic lab services	$0	$0	$0[1] copay / 30%[7] coinsurance	$0 copay / 20%[7] coinsurance	$0 copay[7]	$0
Preventive services (such as screening mammogram, physical, well woman exam, prostate cancer screening, etc.)	$0[1,3] Does not cover lab tests	$0[1,3] Covers screening lab tests	$0[1]	$0[1]	$0[1]	$0[1,3] No prostate cancer screening calendar year limits
Office surgery and diagnostic procedures	20%	$0	$0[1] copay / 30%[7] coinsurance	$0 / $25 or $40 copay[6,7]	$0 / $15 PCP or $25 specialist copay[6,7]	$0
Immunizations*	$0	$0	$0	$0	$0	$0
High-tech radiology (CT scan, MRI, nuclear medicine)	20%	$0	$0[1] copay / 30%[7] coinsurance	$0 copay / $100[7] copay plus 20%	$150[7] copay/scan type/ day	$0
Allergy injections and serum	20%	$0	$0[1] copay / 30%[7] coinsurance	$0 copay / 20%[7] coinsurance	Allergy Serum: $0 Without office visit: $0 With office visit: $15 PCP or $25 specialist copay[6,7]	$0
Eye exam	Does not cover	$0[1]	30%[1]	$40 copay[2]	$25 copay[2]	$0[1]
Vision (Contact lens fitting exams are not covered)	Frames: You pay 100% for non-covered services 20% for one pair of of eyeglasses after each cataract surgery with an intraocular lens.	$0 for one pair of eyeglasses or contact lenses after each cataract surgery that includes insertion of an intraocular lens.	Frames: Does not cover	Community First: You receive a $125 allowance every 2 years in lieu of contacts[3] Scott & White: Does not cover	Does not cover	$150 plan coverage limit for eyewear, glasses, and/or contact lenses every two years unrelated to post-cataract surgery.[18] Allowance can only be used on date of service.
	Contacts: You pay 100% for non-covered services 20% for one set of contact lenses after each cataract surgery with an intraocular lens.	$0 for one pair of eyeglasses or contact lenses after each cataract surgery that includes insertion of an intraocular lens.	Contacts: Does not cover	Community First: You receive a $125 allowance every 2 years in lieu of glasses[3] Scott & White: Does not cover	Does not cover	

Benefit	Original Medicare[1] (Medicare rates are subject to change)	HealthSelect Medicare Advantage Plan℠ (No coordination with Medicare is necessary)	Medicare Primary, HealthSelect Secondary (HealthSelect and Medicare coordinate benefits for you.)	Medicare Primary, GBP HMO Secondary (GBP HMO plans coordinate benefits with Medicare for you.)		KelseyCare Advantage HMO (No coordination with Medicare is necessary)
				Community First, Scott & White	KelseyCare powered by Community	
Routine hearing test	Does not cover	Does not cover	30%	Without office visit: 20% coinsurance, With office visit: $40 copay plus 20% coinsurance	Without office visit: 20% coinsurance, With office visit: $25 copay plus 20% coinsurance	$0 copay for up to one supplemental routine hearing exam every year[12]
Diagnostic speech and hearing testing	20%	$0	$0[4] copay / 30%[7] coinsurance	Without office visit: $0 copay / 20%[7] coinsurance With office visit: $0 copay / $40 copay[7] plus 20% coinsurance	Without office visit: $0 copay / 20%[7] coinsurance With office visit: $0 copay / $25 copay[7] plus 20% coinsurance	$0 for Medicare-covered diagnostic hearing exams
Speech and hearing therapy	20%	$0	$0[4] copay / 30%[7] coinsurance	Without office visit: $0 copay / 20%[7] coinsurance With office visit: $0 copay / $40 copay[7] plus 20% coinsurance	Without office visit: $0 copay / 20%[7] coinsurance With office visit: $0 copay / $25 copay[7] plus 20% coinsurance	$0
Hearing aids	Does not cover	$1,000 benefit allowance per ear every 3 years	$1,000 benefit allowance per ear every 3 years	$1,000 benefit allowance per ear every 3 years (Repairs not covered)	$1,000 benefit allowance per ear every 3 years (Repairs not covered)	$1,500 plan coverage limit for hearing aids every 2 years (Does not include battery replacement) $0 copayment for up to one hearing aid fitting/evaluation every 2 years[2]
Chiropractic care	20% for Medicare-covered chiropractic services	30% for specialist office visit for routine services, up to a maximum of a $75 benefit per visit. Benefit is limited to 30 visits per plan year.	$0[4] copay / 30%[7] coinsurance	Does not cover	Does not cover	$0 for each Medicare-covered visit
Urgent care clinic	20%	$0	$0[4] copay / 30%[7] coinsurance	$0 copay / $50 copay[7] + 20% coinsurance	$0 copay / $50 copay[7] + 20% coinsurance	$0
Emergency room care	20% Plus emergency room copay (waived if admitted to hospital within 3 days of emergency room visit)	• In U.S.: $0 • Outside U.S. and Puerto Rico: 20% after $100 deductible. Limited to $25,000 per plan year or 60 consecutive days, which ever is greater	$0[4] copay/30%[7] coinsurance	$0 copay / $150 copay[7] plus 20% in area and out-of-area covered at listed copayment	$0 copay / $150 copay[7] plus 20% in area and out-of-area covered at listed copayment	• In U.S.: $0 • Outside U.S.: 20% after $250 deductible
Inpatient hospital (semi-private room and days board, and intensive care unit)	$0 after the following amounts for each benefit period[13]: • $1,184 deductible for days 1-60; • $296 copay per day (days 61-90); • $592 copay per lifetime reserve day (days 91-150)	$0	$0[6] If provider doesn't accept Part A, then coverage is $150 copay/day up to $750 per admission and $2,250 per Calendar Year. 30% after copay	$0[6] If provider doesn't accept Part A, then coverage is $150 copay/day up to $750 per admission and $2,250 per Calendar Year. 20% after copay	$0[6] If provider doesn't accept Part A, then coverage is $150 copay/day up to $750 per admission and $2,250 per Calendar Year. 20% after copay	$0 • No limit to the number of days covered by the plan each benefit period[6]

Benefit	Original Medicare[4] (Medicare rates are subject to change)	HealthSelect Medicare Advantage Plan℠ (No coordination with Medicare is necessary)	Medicare Primary, HealthSelect Secondary (HealthSelect and Medicare coordinate benefits for you)	Medicare Primary, GBP HMO Secondary (GBP HMO plans coordinate benefits with Medicare for you.)		KelseyCare Advantage HMO (No coordination with Medicare is necessary)
				Community First, Scott & White	KelseyCare powered by Community	
Outpatient surgery	20% Specified copay for outpatient hospital facility charges	$0	$0 or $100[1] copay – 30%[7] coinsurance	$0 copay / $100 copay[7] plus 20%	$150 copay[7]	$0
Skilled nursing facility	• Days 1-20: $0 (3-day hospital stay required); • Days 21-100: $141.50 coinsurance per day • Per benefit period[5]	• $0 up to 100 days per benefit period (no 3-day hospital stay is required) • You pay 100% after 100 days	• No deductible • Plan pays 100%	$0 copay / 20%[7] coinsurance • 60-day max per plan year • You pay 100% after 60 days	$0 copay / 20%[7] coinsurance • 60-day max per plan year • You pay 100% after 60 days	• Days 1-100: $0 copayment per day • Plan covers up to 100 days each benefit period[5] • No prior hospital stay is required
Home health care	$0	$0	$0[1] copay/30%[7] coinsurance for home infusion therapy Plan pays 100% for all other home health care services with a maximum of 100 visits per calendar year	$0 copay / 20%[7] coinsurance	$0 copay / 20%[7] coinsurance	$0
Hospice	• 5% of the Medicare-approved amount for inpatient respite care • $5 copay for pain management drugs	Same benefits as under Original Medicare	$0[1] copay / 30%[7] coinsurance	$0 copay / 20%[7] coinsurance	$0 copay / 20%[7] coinsurance	• Same benefits as under Original Medicare • You must receive care from a Medicare-certified hospice
Ambulance	20%	$0	$0[1] copay/30%[7] coinsurance Emergency care only. Not applicable to non-emergent transportation services.	$0 copay / 20%[7] coinsurance	$0 copay / 20%[7] coinsurance	$0
Private duty nursing	Does not cover	30% Pays a maximum benefit of $8,000 per calendar year	30% • Unlimited hours • Network only • Preauthorization is required	$0 copay / 20%[7] coinsurance	$0 copay / 20%[7] coinsurance	Does not cover

*Under the Affordable Care Act, certain preventive health and women's services are paid at 100% (at no cost to the member) conditioned upon physician billing and diagnosis. In some cases, you may still be responsible for payment on some services. Some age requirements may apply.
[1] One per calendar year.
[2] One per plan year.
[3] No copayment for a pap smear once every 24 months; once every 12 months for those at high risk.
[4] After payment of deductible. HealthSelect note: Medicare and HealthSelect deductibles run concurrently. Member may be responsible for some charges when the provider does not accept Medicare assignment.
[5] A "benefit period" starts the day you go into the hospital. It ends after 60 days in a row without returning to hospital care. If you go into the hospital after one benefit period has ended, a new benefit period will begin. You must pay the inpatient hospital deductible for each benefit period. There is no limit to the number of benefit periods you may have.
[6] Copayment amount depends on whether treatment is provided by a PCP or specialist.
[7] Payment amount is dependent upon the coordination of benefits (COB) between your carrier (HealthSelect, Community First, KelseyCare powered by Community Health Choice, Scott & White) and Original Medicare. Sometimes this means your expense is $0, but charges will vary depending upon COB. Please reference your Summary of Benefits for more information.
[8] In the event that the provider/facility does not accept Medicare assignment (so the charges are not covered by Medicare and therefore not subject to COB), you may be responsible for copay(s) and/or a coinsurance. Please see your Summary of Benefits for more information.
[9] ERS cannot and does not guarantee the length of time that a specific type of "Value-Added" product shall be offered. Any questions or concerns about these products should be directed to your carrier.
[10] Does not count toward out-of-pocket maximum.

2. Prescription Drug Benefits (HealthSelect and HealthSelect Medicare Advantage)

	HealthSelect Medicare Rx℠	HMOs
Deductible	Each participant must pay a $50 annual deductible before copays apply (for the calendar year, January 1 to December 31).	HMO deductibles are for the plan year, September 1 to August 31.
Participating pharmacies	Copays for up to a 30-day supply of non-maintenance medications are $10 for Tier 1 drugs, $35 for Tier 2 drugs, and $60 for Tier 3 drugs. For up to a 30-day supply of maintenance medication, you will be charged a retail maintenance copay of $10 for Tier 1 drugs, $45 for Tier 2 drugs, and $75 for Tier 3 drugs.	
Non-participating pharmacies	For up to a 30-day supply, you will be reimbursed 60% of the lesser of the amount you pay for the prescription, minus your copay OR the average wholesale price of the drug, plus a dispensing fee, minus your copay. The deductible will be subtracted if not met.	HMOs may not provide benefits at non-participating pharmacies.
Extended Days Supply (EDS) network	If you order prescription drugs through an EDS network pharmacy, you pay the following copays for a 90-day supply: $30 for Tier 1 drugs, $105 for Tier 2 drugs, and $180 for Tier 3 drugs.	Does not apply to HMOs.
Mail order	If you order prescription drugs through the mail service program offered by your health plan, you pay the following copays for a 90-day supply: $30 for Tier 1 drugs, $105 for Tier 2 drugs, and $180 for Tier 3 drugs.	

Section IX - Glossary

Actuarial Accrued Liability (Past Service Liability): This is computed differently under different actuarial cost methods. Generally, the actuarial accrued liability represents the portion of the Actuarial Present Value of Total Projected Plan Benefits attributed to periods of service preceding the valuation date.

Actuarial Gain or Loss: From one plan year to the next, if the experience of the plan differs from that anticipated by the actuarial assumptions, an actuarial gain or loss occurs.

Actuarial Present Value of Total Projected Plan Benefits: Total projected benefits include all benefits estimated to be payable to plan members (retirees and beneficiaries, terminated employees entitled to benefits but not yet receiving them, and current active members) as a result of their service through the valuation date and their expected future service. The actuarial present value of total projected benefits as of the valuation date is the present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment. Expressed another way, it is the amount that would have to be invested on the valuation date so that the amount invested plus investment earnings will provide sufficient assets to pay total projected benefits when due.

Actuarial Value of Assets: The value of Plan Assets used by an actuary for an actuarial valuation. *(See the Actuarial Methods and Assumptions section of this report for a description of the methodology used to determine the Actuarial Value of Assets used in this report.)*

Annual Required Contribution (ARC): A cost measurement related to a defined benefit postemployment benefits plan (other than pensions) calculated under the parameters of GASB No. 43 using actuarially determined information and assumptions. Notably, there is no requirement for a plan sponsor to actually contribute an amount equal to the ARC. It serves only as a basis for recognizing cost and recording financial statement entries.

Normal Cost: Computed differently under different actuarial cost methods, the Normal Cost generally represents the portion of the Actuarial Present Value of Total Projected Plan Benefits attributed to the current year of service for active employees.

Plan Assets: Under GASB No. 43, Plan Assets are defined to be resources, usually in the form of stocks, bonds, and other classes of investments, that have been segregated and restricted in a trust, or equivalent arrangement, in which (a) employer contributions to the plan are irrevocable, (b) assets are dedicated to providing benefits to retirees and their beneficiaries, and (c) assets are legally protected from creditors of the employers or plan administrator, for the payment of benefits in accordance with the terms of the plan.

Unfunded Actuarial Accrued Liability: This is the excess of the Actuarial Accrued Liability over the Actuarial Value of Plan Assets.

PUBLIC AGENDA ITEM - #20

20. Review, Discussion and Consideration of Reappointment of
ERS Investment Advisory Committee Member with a Term Expiring December 31, 2016

December 2, 2016

BACKGROUND:

In accordance with the Employees Retirement System of Texas (ERS) *Investment Policy,* Section 4.3, the ERS' Investment Advisory Committee (IAC) was established at the discretion of the Board of Trustees(Board) in Texas Administrative Code §63.17(b). The IAC is made up of at least five, and not more than nine, members with a current composition of seven members. Members are selected on the basis of their experience making investment decisions and managing financial institutions or other business, or as a prominent educator in the fields of economics or finance. IAC members serve at the pleasure of the Board for staggered three-year terms. Members are subject to compliance with the ERS Investment Policy and Texas Government Code §815.509 and §§815.5091 through 815.5092.

A quorum of the IAC meets at least quarterly with the Board. The IAC assists the Board in carrying out its fiduciary duties with regard to the investment of trust fund assets. As needed, IAC members advise the ERS Board and staff on asset mix, portfolio strategy, investment policy, and eligible securities. ERS staff utilize the expertise of IAC members to assess investment advisors and strategies, and periodically request IAC members participation on selection and review committees, including the deferred compensation program offered by the State to its employees. Involvement with staff allows IAC members to provide further insight, beyond what occurs during the joint Board/IAC meetings.

Biographical and professional background information for Ms. Cooley is included with this agenda item as Exhibit A.

STAFF RECOMMENDATION:
In consultation with the board, staff recommend the Board reappoint Caroline Cooley for a three-year term ending December 31, 2019. The staff's recommended motion is included with this agenda item following the exhibit.

ATTACHMENTS – 1

Exhibit A – Biographical information for Caroline Cooley

EXHIBIT A

Caroline Cooley, Partner,
Crestline Investors, Inc.

Ms. Cooley is Chief Investment Officer of Crestline's Hedge Fund Solutions business and leads the Oversight Committee for Crestline Summit Equity Alpha fund. She also serves on the firm's Investment and Executive Committees. Ms. Cooley has over 33 years of experience in the alternative investment industry as a portfolio manager, risk manager and trader. Ms. Cooley has led the Hedge Fund Solutions team at Crestline, overseeing manager selection and portfolio management, since joining the firm in 1998. Before joining Crestline, Ms. Cooley was a derivatives trader and risk manager with Taylor and Company, an investment firm associated with the Bass Family of Fort Worth, TX. Ms. Cooley began her career in the investment industry at Manufacturers Hanover Trust Company (later merged into JP Morgan) in New York and Chicago after receiving her B.A. in Economics from The College of William and Mary in 1983. Ms. Cooley serves on the Advisory Board of Texas Wall Street Women and is the Vice-Chair of the Investment Advisory Committee of Texas Employee Retirement System.

Crestline Investors, Inc., founded in 1997 and based in Fort Worth, Texas, is an institutional alternative investment management firm with approximately $9 billion of assets under management. Crestline specializes in credit and opportunistic investments, as well as hedge fund and beta solutions. In addition to its Fort Worth, Texas headquarters, Crestline maintains affiliate offices in New York City, Chicago, London, Toronto and Tokyo.

PUBLIC AGENDA ITEM - #21

21. Executive Director Agency Update

December 2, 2016

Legislative Update

The House Pensions committee met on November 14th to address issues related to the Law Enforcement and Custodial Officers Supplemental retirement benefits. The ERS presentation provided information on the funded status of the fund, explained how both the employee class and supplemental fund benefits are calculated for law enforcement and custodial officers and discussed how state employee contributions are subsidizing the higher cost of benefits for LECOSRF members. The committee also took testimony from groups wishing to be added to the supplemental plan, and discussed standards for adding new groups.

Since the last board meeting, ERS delivered the required Interim Study on Type 2 Diabetes to legislators and stakeholders. ERS had already implemented the Real Appeal program before the study was complete, but the report made several other recommendations. These include identifying high-risk individuals, encouraging participants to stick with programs, and continuing to explore other options (like alternative program settings, biometric screenings, and complementary value-based plan design options).

Following the November election, legislators began prefiling bills on Monday, November 14th. ERS identified 33 bills filed on that first day that will be tracked and analyzed. The 85th Legislative Session starts Tuesday, January 10th. That week, the internal ERS Legislative Analysis Group (LAG) will begin meeting weekly. Directors and staff will meet to discuss how filed bills could impact ERS. Subject matter experts will analyze bills and their written analysis will serve as the basis of the LAG agenda. The bill analyses also inform the agency's cost estimates on legislation.

As in past sessions, we will provide you a regularly updated report that shows all of the bills that are being tracked. They are grouped by topic, and each bill is briefly summarized. There is also a column for the status of the bill.

With a Sunset bill to track, a tight budget, and many new and revisited bill ideas, the 85th Legislative Session will be a challenging one. I am confident that ERS has the staff, the experience, and the organization to make it a successful one.

Sunset Update

Public Hearing and Commission Decision Updates:

Since the August 2016 Board of Trustees meeting, the Texas Sunset Advisory Commission has held two public meetings to discuss the review of ERS operations. The first hearing, on August 22, 2016, allowed Sunset staff to publically layout the findings and recommendations contained in the staff report – presented to the Board by ERS staff during the May 2016 quarterly meeting. The hearing also provided the opportunity for ERS to formally respond to the report and for members of the public to testify on the operations and activities of the agency. Senior agency leadership staff and several board members

attended this first hearing, at which Chairman Hester, Executive Director Wilson, and Chief Investment Officer Tom Tull were able to directly respond to questions from the commissioners, primarily regarding investment governance processes.

The second public hearing occurred on November 10, 2016, and did not involve prepared agency or public testimony, but allowed the commissioners to consider and adopt their final recommendations related to ERS. Again, the commissioners focused their discussions on investment governance issues; however, they briefly discussed other topics, such as health network coverage, public information activities, and board composition. The commission adopted all 15 recommendations included in the five issues of the original staff report, unanimously without significant discussion. The commissioners also considered seven new recommendations not made by Sunset staff in the original report. Of the seven new recommendations considered, the following three were adopted:

1. **Statutory Change proposed by Senator Charles Schwertner:** "Change the statutory requirement for the ERS Board of Trustees to adopt its experience study, and resulting actuarial assumptions, from once every five years to once every four years." (The change would take effect with the adoption of the next experience study in 2018, requiring the following study to be adopted in 2022 instead of 2023.)

2. **Statutory Change proposed by Senator Charles Schwertner:** "Require the ERS Board of Trustees to approve any individual investment over $100 million." (Senator Schwertner clarified during the hearing that his intent was for this change to apply to alternative investments only – private equity, private real estate, hedge funds, and infrastructure investments.)

3. **Management Action proposed by Senator Charles Schwertner:** "Direct ERS, as part of its 2017 internal audit review of investment governance, to consider best practices in investment decision-making process, including
    - the composition of its internal investment committees,
    - investment authority,
    - veto authority, and
    - board oversight and use of the Investment Advisory Committee.

    ERS would provide a copy of the internal audit report to the appropriate substantive legislative oversight committees, as well as the governor, lieutenant governor, and speaker upon presentation to the Board of Trustees." (The internal audit review of investment governance operations in place at ERS, along with industry best practices, is scheduled to be presented to the Board of Trustees during the February 2017 quarterly meeting, and would then be released to the listed legislative oversight offices.)

<u>Implementation Status of Staff Report Recommendations:</u>

Since May 2016, ERS staff has been working to implement all of the Sunset recommendations that do not require statutory change to enact. To date, staff has succeeded in fully implementing five of the 15 recommendations. Another three recommendations have been partially or materially completed with identified completion dates within the current fiscal year. Seven recommendations remain under consideration by ERS staff – involving industry best practice research and operational process and organizational reviews. Six of these are related to statutory changes that will not provide final direction and authority until potential passage during the 85th Regular Legislative Session. Although not required to begin implementation of recommendations until final adoption by the commissioner members, ERS began working on implementation activities early because they represented identified improvements to agency

operations that would benefit ERS members and stakeholders, or provide benefit services in a more efficient or cost effective manner.

Plan Year 2017 Fall Enrollment Update

Fall Enrollment for Medicare-eligible retirees and their families was held October 31 – November 18. ERS mailed custom Personal Benefits Enrollment Statement packets to 81,675 members to provide them with current enrollment, eligible coverage options and information on Plan Year 2017 changes. The packets included information about UnitedHealthcare's role as the new administrator of the Medicare prescription drug program, to help members with the transition that will take place January 1. ERS hosted enrollment fairs around the state, along with webinars, to allow members to receive important benefits information, ask questions and share information with us.

Fall Enrollment was the first chance for Medicare-eligible members and their families to sign up for State of Texas Vision. Approximately 3,294 members and dependents enrolled.

Members participated in Fall Enrollment in the following ways:

- 4,962 members made changes to coverage.
- About 580 people attended 19 fairs across Texas and three webinars.
- We received 4,099 phone calls:
    - 551 at ERS and
    - 3,548 at ACT
- 46 people visited ERS in person.

Chapter 615 (Benefits) For Eligible Survivors of Certain Individuals Killed in the Line of Duty

The Texas Legislature enacted Chapter 615 of the Texas Government Code during the 60th legislative session (1967) to provide death benefits for eligible survivors of certain law enforcement officers, fire fighters, and others killed in the line of duty. The program is fully funded by the State and benefits are not paid from the retirement trust fund. The program is administered by the Employees Retirement System of Texas (ERS). Administrative duties include receiving and processing the applications, including determining whether the individual died in the line of duty. ERS also manages the payment process for the lump sum benefits.

The surviving spouse, child(ren), or parent(s) of individuals listed in the Texas Government Code Section 615.003 such as:

1. an individual elected, appointed, or employed as a peace officer by the state of Texas or a political subdivision of the state of Texas;
2. an individual who is employed by the state or a political or legal subdivision and is subject to certification by the Texas Commission on Fire Protection;
3. a parole officer employed by the Texas Department of Criminal Justice;
4. an individual who:
    a. performs emergency medical services or operates an ambulance;
    b. is employed by a political subdivision of the state or is an emergency medical services volunteer; and
    c. is qualified as an emergency care attendant or at a higher level of training;

These parameters do not limit eligibility to state employees, so ERS works with police, fire and EMS departments throughout the state of Texas.

Available Chapter 615 benefits:

- A lump sum payment of $500,000 from the State of Texas for the eligible surviving spouse, child, or parent.
- A monthly payment to the eligible surviving minor child(ren) until the surviving child(ren) reaches age 18:
    - $400 per month, if there is one surviving child
    - $600 per month, equally split, if there are two surviving children
    - $800 per month, equally split, if there are three or more surviving children

Other eligible benefits survivors may be eligible for, but are subject to rules and eligibilities:

- Spousal monthly payment
- Funeral expenses
- Health, Dental, and/or Vision Insurance
- Educational Benefits

Unfortunately, this has been a very difficult year for law enforcement deaths. In FY 16, ERS processed benefits for the families of 17 officers. It is our honor to process these benefits for these deserving family members.

Board Web Portal Service

ERS wants to make it easier for board members to access information related to the board meeting and other material provided to them currently through the secured web portal. After assessing the pros and cons of reconstructing the existing portal on our web content management system, staff decided to pursue a more user-friendly and flexible software service to replace the existing portal.

Over the course of several months, staff from multiple divisions researched and evaluated software services for managing and sharing Board-related information. Staff identified five vendors that offer these specific services. ERS reviewed a series of demonstrations to further assess the core features, functionality and pricing of their service solutions. After completing its evaluation of the five software services, staff identified a solution that provides the best value of software services for Board meeting management. Staff is in the process of finalizing an agreement with the vendor to provide this service.

The selected solution is an effective and secure web service that allows users to quickly search, share and manage agenda items, exhibits and meeting minutes in a convenient, easy-to-use manner. It will reduce the reliance on paper-based Board materials by offering users the option to view materials electronically at their convenience, saving staff time attributable to printing, binding and updating the physical materials.

We plan to introduce the new service before the February 2017 Board meeting, while maintaining duplicate documentation on the existing web portal. All users will receive training on the service prior to implementation. ERS plans to decommission its existing web portal and exclusively use the new service for the May 2017 Board meeting.

Executive Office Reorganization

We recently reorganized the Executive Office. We believe this new structure will make for a better team environment and clearer roles and responsibilities. Effective on November 1, the Governmental Affairs Division and the Enterprise Planning Office (EPO) were reconfigured as functional units within the Executive Office, rather than stand-alone divisions. This move creates a larger team devoted to executing enterprise wide and other strategic projects, and encourages teamwork.

Specifically, Shack Nail will resume the title of Director of Governmental Relations, while continuing to report to the Executive Director. Keith Yawn will move from EPO to lead a new Strategic Initiatives unit, which will include former Governmental Affairs staff members Leah Erard and Jennifer Jones. This team will help the Executive Office carry out important projects that are vital to the success of ERS.

Bernie Hajovsky will continue to lead the Enterprise Project Office and the excellent work his team does in managing agency projects. In addition, Dana Jepson will join his team so that she can work along with Michelle Sneed to progress – at a GBP enterprise level – on health initiatives that will improve the quality of life for participants, while making sense for the overall program. EPO will also assume the agency performance measurement deliverables that was previously being done by Governmental Affairs.

Mike Ewing will join the Office of the General Counsel, where he will continue to manage the legislative analysis process for the upcoming session, and also support other areas of need for the Office of the General Counsel using his research and drafting expertise.

Mary Jane Wardlow will continue to serve as the agency's media spokesperson and will report directly to Cathy Terrell.

State Employee Charitable Campaign (SECC)

The State Employee Charitable Campaign (SECC) is a statutorily authorized workplace campaign that provides state employees with a convenient and efficient way to make voluntary contributions to charities.

This campaign involves numerous charities, offering employees broad choices in giving. These charitable organizations must meet strict eligibility and accountability standards and must demonstrate that they provide direct and indirect health and human services that benefit Texas citizens. Employees can donate through payroll contributions or make a one-time donation.

We kicked off our campaign this year on September 2nd at the Dell Diamond with the Round Rock Express.

Our campaign ran from Monday, September 26th - Friday, October 14th and our Charity Fair was held on Wednesday, October 5th with almost 20 different charities represented.

We are pleased to announce our results exceeded our campaign goals of a 51% participation rate and $38,000 in contributions. 90% of ERS employees contributed over $56,122 for the 2016 campaign. There were seven divisions that had 100% participation:

1. Internal Audit - 3 years
2. Benefit Contracts - 3 years
3. Executive Office – 3 years
4. Investments – 2 years
5. Office of the General Counsel – 1 year

6. Benefits Communications – 1 year
7. Office of Procurement and Contract Oversight– 1 year

This year's Chair was Carla Lawrence from Customer Benefits and Co-Chair was Beth Gilbert from Internal Audit.

PUBLIC AGENDA ITEM - # 22

22. Set 2017 Meeting Dates for the Joint Meeting of the ERS Board of Trustees And Investment Advisory Committee, the Meeting of the Board of Trustees, and The Meeting of the Audit Committee

December 2, 2016

Proposed 2017 Meeting Dates

Wednesday, February 22, 2017

Wednesday, May 17, 2017

Wednesday, August 23, 2017

2 Day Workshop:
Tuesday - Wednesday, December 12 & 13, 2017

PUBLIC AGENDA ITEM - # 23

23. Executive Session

December 2, 2016

Executive Session – In accordance with Section 551.072, Texas Government Code, the Board of Trustees will meet in executive session to deliberate the purchase, exchange, lease or value of real property and the ERS building. Thereafter the Board may consider appropriate action in open session.

PUBLIC AGENDA ITEM - # 24

24. Adjournment of the Board of Trustees

December 2, 2016